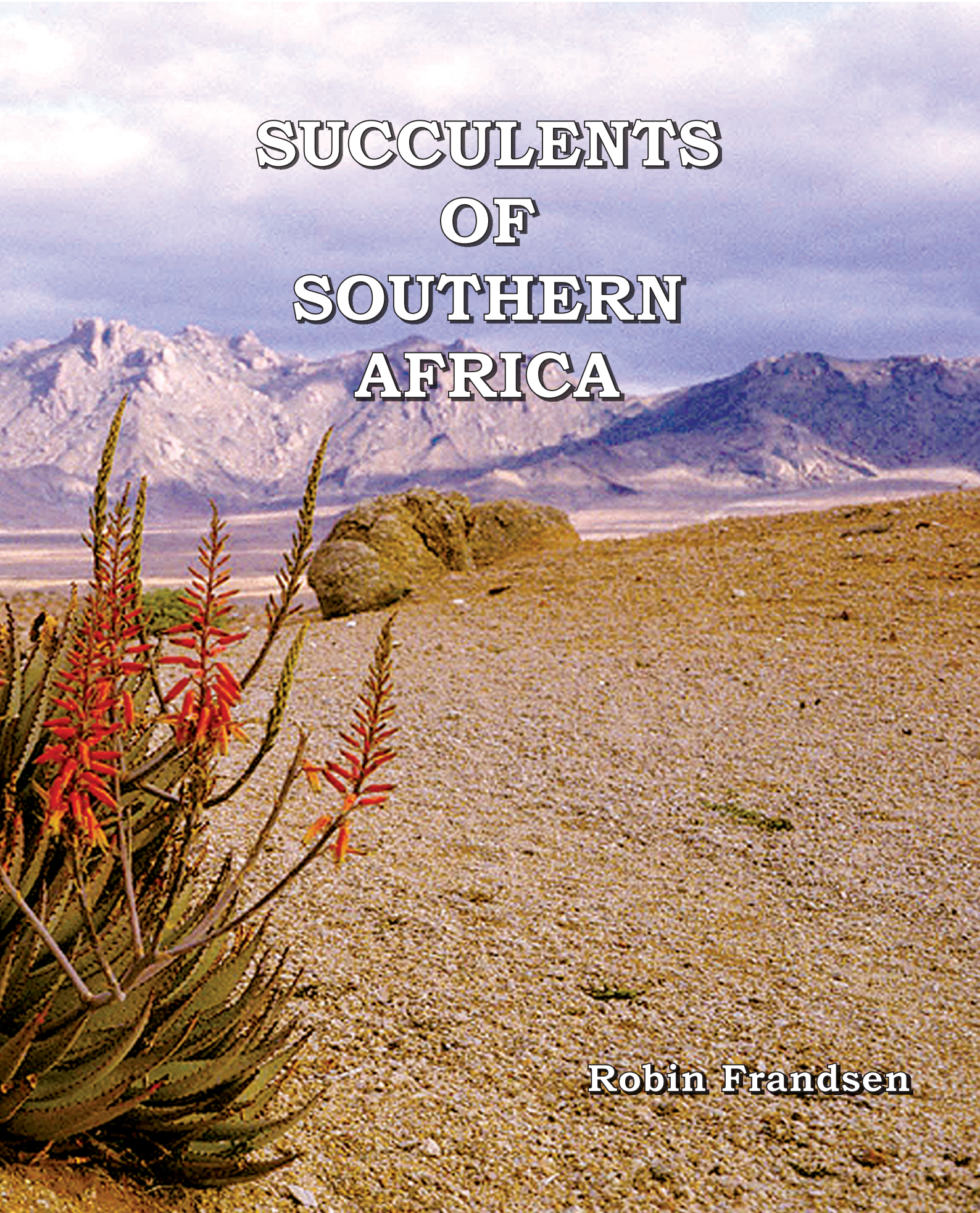


SUCCULENTS OF SOUTHERN AFRICA



Robin Frandsen

Succulents of Southern Africa includes over 130 genera, 1100 species with their subspecies and varieties and over 2700 photographs. It is regarded as the one of the most extensive and user-friendly books available covering a very extensive range of the succulent flora of the regions it covers, namely South Africa, Namibia, Botswana, Zimbabwe and southern Mozambique. It was written to further knowledge of our fascinating and remarkably fecund succulent flora diversity and to aid in the spread of the knowledge of this diversity and thereby aiding in its conservation.



It has therefore been my pleasure to donate *completely free-of-charge*, the entire book as an easily down-loadable, e-book which, when downloaded, can be stored on your PC or laptop for use whenever you wish to.

It will be appreciated for those who feel they can afford to do so and, who have download the book, to consider making a donation as a form of a Royalty. Of course this is absolutely voluntary and I am delighted that anyone is now able to freely have access to this remarkable book completely free of charge.

How to donate

Please use **Paygate**, a completely secure international payment system

1 Go onto our website: **www.honeyguidepublications.com**
2 Click on the Succulents book illustration, you will then go to the book's page
3 Click on 'ORDER NOW'
4 In the *required* fields:
  Fill in your name, followed by the amount you wish to donate (e.g. John Smith US$20)
  Enter your email address if you wish an acknowledgement of you donation, also the minimum address information *asked for* (necessary for successful completion of the form, and which we will not use for any reason)
5 Please add from which country you are - *for our information*
6 Under 'PAYMENT DETAILS' do the following:
  Click on the credit card you wish to use
  Enter your card number, expiry date and CCV number on the back of your card
8 Or if EFT (South Africa only) Follow the instructions supplied
9 Click on '**SUBMIT**'



This payment request goes through the secure system 'PAYGATE'. Your details will not be used for any other purpose, except the one for which you intend it to be.

My thanks and appreciation go to Daniel Schweich from Lyon, France, of Bibliotéque Numèrique du CF for successfully organising the download
Go to their website for more free downloads of succulent and cactus publications

www.cactuspro.com/biblio

SUCCULENTS OF SOUTHERN AFRICA



Photograph
David Frandsen



SUCCULENTS OF SOUTHERN AFRICA

ROBIN FRANDSEN

HoneyguidePublications
2017



Published by
HONEYGUIDE PUBLICATIONS CC
CK96/46684/23
P O Box 1276
Somerset West
South Africa
7129
E-mail: frandsen@icon.co.za
Website: ww.honeyguidepublications.com

FIRST PUBLISHED 2017

© Robin Frandsen, P O Box 1276, Somerset West 7129, South Africa
frandsen@icon.co.za

© Photographs are copyright to the owners and are used with permission

Maps, production, reproduction and design by the author
Dust jacket design: Joy Frandsen

Dust jacket: Judd Kirkel Welwitch, Orbea namaquensis
Title page photograph: *Aloe ferox* in the Seweweekspoort, NE of Ladismith in the Little Karoo: David Frandsen

Printing: Tien Wah Press, Singapore

All rights are reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means, electronic, mechanical, photocopying, recording or otherwise without the prior permission of the copyright owner(s).

ISBN 978-0-620-74955-8



This work is respectfully dedicated to

Robert Allan Dyer

a great man and a dear friend

and to my family

Joy

Jeffrey, David and Elizabeth

and above all to Him who created it all

Colossians 1:16

FOREWORD

It has been for me a most pleasant surprise when my old friend, Robin Frandsen, invited me to write these introductory lines to his opus on The Succulents of Southern Africa. He and I have, for the past five decades, shared the same fascination for the strange and utterly diverse assemblage of plants he has contrived to describe so eloquently and figure in his book.

Southern Africa's amazingly rich flora comprises, as is so well known, a truly huge number of of succulent species, representatives of which may be sought in no less than 59 families. Many noteworthy authors have, in the past, produced *pro parte* studies of individual groups but most have shrunk from the quasi impossible task of producing a synthetic picture of this large assemblage. The three editions of Doreen Court's work Succulent Flora of Southern Africa stand out in this respect and have, at least so far as I can recall, not been followed by others.

It is quite obvious that, in presenting a synthesis of all that is known on the succulent plants of the Southern African Region, Robin Frandsen was in the first place faced with the choice of those genera that he considered most worthy of being included in his book, as also of the species best suited for that purpose, by virtue of beauty and general interest. The difficult questions arising from this situation have, in my view, been admirably addressed. The result is a well balanced presentation that includes representatives of all the principal groups that include succulents in one form or another. The photography is very good indeed and the fact that the images are included under the individual taxa is very satisfactory.

In my opinion, Robin Frandsen has been most successful in achieving his objectives. His Succulents of Southern Africa give the reader an insight into the great complexity of the material treated. He covers, for example, the principal morphological adaptations within the Mesembryanthemaceae, a hurdle that has been generally avoided by less enterprising authors in any but the most technical publications.

It is with the greatest interest that I have read this most recent of the many publications produced by Robin Frandsen. I think it will become indispensable to all those that are fascinated by the incredible diversity of succulent plants in the Southern African region.

John Lavranos
Loule
Portugal





Sarcocaulon lavrani Halda, in habitat in the Richtersveld
Photos Judd Kirkel Welwitch

ACKNOWLEDGEMENTS

It must be said that the success of this work has to be largely attributed to the kind and open-handed contribution of photographs and assistance from a number of individuals. The patience and the cost of accumulating their photographs cannot be underestimated and I am sure that inclusion in such a book as this, must be most rewarding. Interest in and the fascination of the remarkable heritage of southern African plant life, and in particular the succulent flora, has attracted contribution from enthusiasts from all over the world. A number of the contributors of the photographs are not only from southern Africa but from as far afield as Japan, Australia, Europe and the United States.

Although there are a number of fine books on our succulent flora, there are few publications of the same magnitude and scope, covering as it does such a wide range of this group of flora. Although it cannot be called a comprehensive work, it can confidently be classed as a very extensive record, which has exceeded any other publication so far produced on the subject. It has been a lifetime dream to compile this pubication and at such a late stage of my life it is perhaps doubly rewarding.

The extensive research, writing, compiling and creating the work has taken several years. It has required the 'patience of Job' for my wife Joy. To her is given my heartfelt thanks and appreciation both for her interest and for having to have put up with me during this time.

It may be unusual to make this further acknowledgement but I wish to do so as, quite possibly, I may not have been spared to compile this work. About five years ago I was desperately ill in intensive care with terminal widespread cancer and had been given less than two months to live by my specialist surgeon. If it had not been for the grace of God and the wonderful assistance of the eminent oncologist Prof. JP (Amo) Jordaan, in Durban, who literally dragged me back from the brink of death, *Succulents of Southern Africa* would never have seen the light of day. To God and to Prof. Jordaan I am eternally grateful. Today I am cancer free and truly blessed.

So extensive have been the contributions that it is very difficult, indeed impossible, to give preference in the listing of contributors. However there are several persons who have shown a particular interest and have contributed hugely in encouragement and advice, as well as in some cases, with many photographs, adding immensely to the completion of the work. It is my pleasure to list them alphabetically as follows and to express my especial appreciation:

Bruce Bayer, Rolf Becker, Gerhard Beukes, Priscilla Burgoyne, Bob Chinnock, Desmond and Naureen Cole, Org Fritz, François Hoes, Niels Jacobsen, Kuba Jilemicky, Judd Kirkel Welwitch, John Lavranos, Alma Moller, Philip Nel, the late Tim Peatling, the late Darrel Plowes, Kobus Venter and Loukie Viljoen.

My heartfelt thanks go also to all the following persons who, through their generous contributions of photographs, have made the work possible and a success: Jean-André Audissou, the late Jerry Barad, Horst Burba, Sylvain Bergaud, Andries Cilliers, Dennis de Kock, Nigel Dennis, Fanie de Meillon, Jeffrey, David & Elizabeth Frandsen, Edson Gentile, Sean Gildenhuys, Mike Kimberley, AW Klopper, Ronel Klopper, Carl Frederick, John Frew, Jeff Harris, Martin Heigan, Friederika Hüber, Dawie Human, Ryan MacNew, Paolo Michelazzo, Michael Milanovich, Michael Monnier, Chris Moore, Itzok Mulej, the late Nico Myburgh, Rob Nagel, Pavel Pavelsky, Inge Pehlemann-Brase, Len Petzer, Bert Polling, Kotie Retief, Tim Saunderson, Gideon Smith, David Styles, John Trager, Ulrich Trünkle, Valentino Vallichelli, Ernst van Jaarsveld, Jacques van Thiel, Russell Wagner.

I should also like to express my appreciation to the Directors and staff of the South African National Botanic Institute for permitting the use of photographs taken by members of its staff.

There are more than 2500 photographs in the book and a great deal of care has been taken so that each photograph has the correct labelled acknowledgement of its photographer. Should there be an error anywhere please notify the author and it would be corrected for any future reprint - and accept my most sincere apology.

I should like to express my thanks and appreciation to François Steffens for the careful checking of the text and my son Jeffrey for his invaluable technical assistance.

Robin Frandsen
Somerset West

CONTENTS

Foreword vi

Acknowledgements vii

Contents viii

Introduction x

Asphodelaceae Juss.
- *Aloe* L. 2
- *Aloiampelos* (Haw.) Klopper & GF Smith 60
- *Aloidendron* (Haw.) Klopper & GF Smith 62
- *Aristaloe* Boatwr. & JC Manning 64
- *Gonialoe* Boatwr. & JC Manning 64
- *Kumara* Medikus 66
- *Astroloba* Uitewaal 66
- *Bulbine* Wolf 68
- *Gasteria* Duval. 68
- *Haworthia* Duval 76
- *Haworthiopsis* 106
- *Tulista* 114

Apocynaceae Juss.
- *Adenium* Roem. & Schult. 116
- *Pachypodium* Lindl. 118

Asteraceae Dumort.
- *Othonna* L. 120
- *Senecio* L. 122

Asclepiadaceae R. Br.
- *Angolluma* Munster 124
- *Australluma* Plowes 126
- *Baynesia* Bruyns 126
- *Duvalia* Haw. 126
- *Hermannschwarzia* Plowes. 132
- *Hoodia* Sweet ex Decne 132
- *Huernia* R. Br. 140
- *Huerniopsis* N.E. Br. 160
- *Larryleachia* Plowes 162
- *Lavrania* Plowes 164
- X*Luckhoffia* 166
- *Neopectinaria* Plowes 166
- *Notechidnopsis* Lavranos & Bleck 168
- *Ophionella* Bruyns 168
- *Orbea* Haw. 170
- *Orbeanthus* L.C. Leach 178
- *Orbeopsis* L.C. Leach 178
- *Pachycymbium* L.C. Leach 182
- *Pectinaria* Haw. 184
- *Piaranthus* R. Br. 186
- *Quaqua* N.E. Br. 188
- *Richtersveldia* Meve & Liede 198
- *Stapelia* L. 198
- *Stapeliopsis* Pillans 216
- *Tavaresia* Welw. 216
- *Tridentea* Haw. 218
- *Tromotriche* Haw. 222
- *Vadulia* Plowes 226
- *Brachystelma* R. Br. 226
- *Ceropegia* L. 238
- *Fockea* Endl. 240

Geraniaceae Juss.
- *Pelargonium* L'Hér. 240
- *Sarcocaulon* (DC.) Sweet 246

Passifloraceae Juss. ex Kunth
- *Adenia* Forssk 252

Dioscoreaceae R. Br.
- *Dioscorea* L. 254

Euphorbiaceae Juss.
- *Euphorbia* L. 254
- *Monadenium* Pax 302

Mesembryanthemaceae Fenzl
- *Acrodon* N.E. Br. 304
- *Aloinopsis* Schwantes 304
- *Antegibbaeum* Schwantes ex C. Weber 308
- *Antimima* N.E. Br. emend. Dehn 308
- *Aptenia* N.E. Br. 310
- *Argyroderma* N.E. Br. 310
- *Bergeranthus* Schwantes 314
- *Bijlia* N.E. Br. 314
- *Braunsia* Schwantes 316
- *Carpobrotus* N.E. Br. 316
- *Carruanthus* (Schwantes) Schwantes 318
- *Cephalophyllum* N.E. Br. 318
- *Cerochlamys* N.E. Br. 320
- *Chasmatophyllum* Dinter & Schwantes 320
- *Cheiridopsis* N.E. Br. 322
- *Conicosia* N.E. Br. 326
- *Conophytum* N.E. Br. 326
- *Cylindrophyllum* Schwantes 356

Dactylopsis N.E. Br. 358
Deilanthe N.E. Br. 358
Delosperma N.E Br. 358
Didymaotus N.E. Br. 360
Dinteranthus Schwantes 360
Diplosoma Schwantes 362
Dorotheanthus Schwantes 362
Dracophilus (Schwantes) Dinter & Schwantes 364
Ebracteola Dinter & Schwantes 364
Faucaria Schwantes 366
Fenestraria N.E. Br. 368
Frithia N.E. Br. 368
Gibbaeum (Haw.) N.E. Br. 370
Glottiphyllum N.E. Br. 374
Hartmanthus N.E. Br. 378
Ihlenfeldtia H.E.K. Hartmann 378
Jordaaniella Herre 380
Juttadinteria Schwantes 380
Khadia N.E. Br. 380
Lapidaria (Dinter & Schwantes) N.E. Br. 382
Lithops N.E. Br. 384
Meyerophytum Schwantes 402
Mitrophyllum Schwantes 402
Monilaria N.E. Br. 404
Muiria N.E. Br. 404
Namaquanthus L. Bolus 406
Namibia (Schwantes) Schwantes 406
Nananthus N.E. Br. 406
Nelia Schwantes 406
Neohenricia L. Bolus 408
Odontophorus N.E. Br. 408
Oophytum N.E. Br. 410
Orthopterum L. Bolus 410
Oscularia Schwantes 410
Peersia L. Bolus 412
Phyllobolus N.E. Br. 412
Pleiospilos N.E. Br. 412
Prepodesma N.E. Br. 414
Psammaphora Dinter & Schwantes 414
Rabiea N.E. Br. 416
Rhinephyllum N.E. Br. 416
Rhombophyllum (Schwantes) Schwantes 418
Ruschianthus L. Bolus 418
Saphesia N.E Br. 418
Schwantesia Dinter 418
Stomatium Schwantes 420
Synaptophyllum N.E Br 422
Tanquana H.E.K. Hartmann & Liede 422
Titanopsis Schwantes 424
Trichodiadema Schwantes 424
Vanheerdea L. Bolus ex H.E.K. Hartmann 424
Crassulaceae DC.
Adromischus Lem. 426
Cotyledon L. 428
Crassula L. 432
Kalanchoe Adans. 452
Tylecodon Toelken 454
Pedaliaceae R. Br.
Pterodiscus Hook 458
Sesamothamnus Welw. 460
Portulacaceae Juss.
Anacampseros L. 460
Avonia (E. Mey. ex Fenzl) G.D. Rowley 464
Ceraria H. Pearson & Stephens 466
Portulacaria Jacq. 468
Bombaceae Kunth
Adansonia L. 468
Moringaceae R. Br. ex Dumort
Moringa Adans. 470
Vitaceae Juss.
Cyphostemma (Planch.) Alston 470
Welwitschiaceae Markgr.
Welwitschia Hook.f. 474

Glossary 476

Selected references 480

Index 482

Sponsors, Collectors & Subscribers 496

INTRODUCTION

Southern Africa and, in particular, the western and southern Cape, is the habitat of a very large array of succulent plants. No other region on earth boasts as many species of this unique group as does southern Africa. Taxonomists have recorded in excess of 5000 species in this subregion and these are recognised in approximately 60 families. This represents nearly 50% of the succulent plant species of the planet. If one discounts the approximately 300 genera and 2500 species of the Cactaceae, all of which are native to the Americas, this percentage is much higher. Regions represented in this work are South Africa, Namibia, Botswana, Zimbabwe and southern Mozambique.

What *Succulents of Southern Africa* sets out to do is to present those species which are of particular interest as being attractive, spectacular, notable and also worthy of being represented in collections and gardens. Of the somewhat 5000 species in the region only a limited number of plants meet these criteria and many of these are represented herein.

Many of the species of the region are regarded as 'weedy' plants but are nevertheless unique, in their own right, as regards their special niches and forms. They sometimes occur in vast numbers to carpet the veld with spectacular colour; sometimes they are so cryptic as to defy discovery and only become evident at flowering times. They are sometimes bushy and they are occasionally armed with vicious thorns. Sometimes they are really unattractive with nothing to recommend them to any special interest, but they are nevertheless of great ecological value and constitute a very important constituent of the veld, providing food, water and shelter to flora and fauna both large and small.

Namaqualand after heavy rains: Jeff Frandsen standing in fields of shrubby succulent mesems, other ephemerals and geophytes, south of Springbok *Photo Robin Frandsen*









After heavy rains some areas are covered with vast numbers of succulent annuals - weedy succulents - which sprout rapidly from seeds and cover the seemingly barren ground of the desert regions. They flower and set seed at an astonishing rate, die off and the seed is left dormant sometimes for years, awaiting the next favourable rains to repeat the cycle. Top picture is of a scene in the central Richtersveld National Park after unusually heavy rainfall. Bottom left is the annual, *Synaptophyllum juttae*, photographed at Lüderitz in Namibia and bottom right is the beautiful deep-pink annual, *Prenia pallens* var. *namaquensis*, which was carpeting vast fields at the rim of the Fish River Canyon in Namibia *Photos Robin Frandsen*

Many of the so-called 'weedy' succulents in this region are found in the Mesembryanthemaceae (or the 'Vygie') group. Some plants of the shrubby or mat-forming genera, such as *Lampranthus*, *Ruschia*, *Mesembryanthemum*, *Drosanthemum*, *Delosperma*, *Carpobrotus,* and *Synaptophyllum*, some of which are annuals and are spectacular components of the countryside especially after rains, are also included.

Plants featured in the book will be of the type which will be of interest to the succulent plant enthusiast and the interested amateur who could be persuaded to a lasting interest in this fascinating group of plants. Examples of the plant types included are as per the following group of photographs on pages xvi - xix.

THE FASCINATION OF SUCCULENTS: Almost everyone has some or other form of interest or hobby. Some collect stamps, some have a fascination for steam trains, many are keen gardeners or collect and grow orchids, cycads etc. This





Left *Cheiridopsis peculiaris* from west of Steinkopf. Centre *Euphorbia stellispina* from east of Laingsburg. Right *Gibbaeum pilosulum* var. *nuciforme* from north west Little Karoo.
Photos Robin Frandsen

shows therefore that in mankind there is a need for an extramural interest to allow escape from the often humdrum of secular life and the need is indeed a powerful one. What impels one to choose a particular interest is subjective and it can best be described in the maxim 'beauty [or interest] is in the eye of the beholder'. This is true of a burgeoning world-wide interest in succulent plants. The New World cacti-cult is widespread, and interest in succulent plants, other than cacti, has been growing by leaps and bounds.

Interest in the phenomenal diversity of the succulents of the southern African subregion is not confined to this region but has captured the imagination of a world-wide community. As opposed to cacti, which it cannot be gainsaid, has a fairly large and interesting diversity of form, the form and variation in both the character and flowers of the succulent plants of this subregion have a bewildering and massive variation, far more so than that of the cacti. This is represented in the very large number of genera and species of succulents as mentioned previously.



Lithops otzeniana in habitat at Brakfontein, north of Loeriesfontein
Photo Robin Frandsen

This burgeoning interest in recent times is largely responsible to the internet and to the increasing number of high-quality publications being produced. The extent of the incredible plant diversity of the region was largely unknown because of the paucity of books on the subject. Those publications which are available generally, usually deal only with a specific genus or group. The stilted and rather pompous academic nature of the earlier books was a put-off and they appealed mainly to the already dedicated 'succulentophile' or scientist.

Furthermore the standard of early printing left the colour reproduction in these very early volumes much to be desired. These early publications included such works as Nel's *Lithops*, White & Sloane's three volumes on stapelias, White, Dyer & Sloane's two volumes on euphorbias, Schwantes' *Mesembs* (*Flowering Stones*), Herre's *Genera of the Mesembryanthemaceae*, Nel's *Gibbaeums*, Reynolds *Aloes* as well as a number of other more inconsequential publications. All of these, as a result of huge taxonomic changes and new taxa additions, are now hopelessly out of date. Some are very expensive, unobtainable and of collectors' interest only.

In recent years there has been a resurgence of excellent books but, then again, they have been mainly on single groups of plants: *inter alia* these are Allen Dyer's *Brachystelma*, Bruce Bayer's three successive books on haworthias, Des and Naureen Cole's two successive volumes on lithops. Steven Hammer has had two successive volumes on conophytums and one on lithops published and Peter Bruyns has fairly recently published two sumptuous volumes on stapeliads.

Other recent publications are Ben-Erik van Wyk & Gideon Smith's two successive volumes on Aloes, the late Charles Craib's very attractive book on grass aloes and, more recently, with John Lavranos, his comprehensive work on the genus *Monsonia* (*Sarcocaulon*) titled *The Bushman Candles,* and two smaller books: *Mesembs of the World* by a group of authors.

It will be seen from the above that there is a paucity of books on general succulents. However a few have been produced: Doreen Court has authored three successive updated books on succulents, Ernst van Jaarsveld has produced an attractive, but basic, slim field guide on the subject and a recent addition is a slim soft-cover volume on succulents of South Africa by Gideon Smith and Neil Crouch. Otherwise there is little else. Certainly nothing is available currently to the extent, lavish style and user-friendliness of this work which records some 133 genera, 1117 species with their subspecies and varieties and with 2510 photographs illustrating every species on the same spread as their text.

The fascination of succulent plants can adequately be illustrated for example by my personal introduction to this very interesting subject: In the very early 1960s, although I was an ardent and dedicated follower of nature, I knew nothing at all about succulent plants. At a friend's house I encountered and was intrigued by a small garden where there were some common echeverias, sedums and opuntoid and globular cacti. That settled it! Since then I have had a burgeoning and undiminished interest in the enthralling and captivating world of succulent plants.

WHAT IS A SUCCULENT? The definitive answer to this question has, for a long time, puzzled and eluded taxonomists and is a controversial question. Attempts to come to a satisfactory answer have been relatively unsuccessful. However four probable definitions have been proposed and within these parameters are encompassed the plants which are believed to constitute succulent plants:

TRUE SUCCULENTS: This group is comprised of the plants in which there is little controversy and which are regarded as true succulents. They have various combinations of succulent leaves, stems, roots or inflorescences. This category includes plants with various degrees of succulence and it also includes most of the semi-succulents.



A fine display of hybrid aloes in the entrance of Gariep Plants in Pretoria
Photo Robin Frandsen

CRYPTIC SUCCULENTS: This category includes plants which may not be self-evident as succulents, such as the baobabs, the cussonias (cabbage trees) and cycads. Their stems are usually fibrous rather than succulent, but they are able to subsist in conditions of drought due to the presence of stored water in their trunks.

CAUDICIFORMS: These are the plants which survive drought due to the presence, either above or below ground, of swollen (sometimes hugely and grossly so) water- and nutrient-storage caudexes. Examples are *Dioscorea* (Elephant's foot), various *Pachypodium* species and others.

CONTRIVED SUCCULENCE: These are sometimes included in horticulturist's catalogues but are not strictly succulents. An example is the Dragon tree (*Dracaena* sp.).

Included in this work are plants from the first, second and third groups. Most will be from the first group, the *Baobab* from the second and some of the caudiciforms, in particular, those with swollen caudexes from above ground such as *Dioscorea* (Elephants foot), *Adenia* etc. in the third.

CULTIVATION: Of necessity the cultivation of succulent plants is a very wide subject. The species within the succulent group of plants have extensive and diverse requirements. The cultivation of most is the very essence of simplicity where, (provided they are not entirely deprived of moisture or, in most cases, not subjected to sub-zero temperatures—although some will even thrive in such circumstances) they will survive and flourish. Others, in particular those plants which have very specific needs, will succumb very readily if not afforded their basic requirements.

Of paramount importance, and this is almost invariable, sufficient light must be available, both naturally or artificially. Although some plants are inhabitants of areas of intense and hot sun, it should be remembered that these same areas are sometimes covered by fog clouds, sometimes for weeks on end.

Some delicate highly succulent plants, although they thrive in nature in direct fierce sunshine, can perish if moved suddenly from semi-shade to direct unrelenting sun. They also, although accustomed to the harsh sunshine of their arid natural habitat, can burn, discolour or even die if exposed to the direct sunlight of the more humid climes.

Some authors go so far as to assert that some of the more difficult habitat-specific plants will die if not afforded the correct soil mix to which they are accustomed in nature. This I believe is not entirely accurate and that, given adequate greenhouse or hothouse light and careful watering and even, in certain cases, misting, just about all plants will survive quite happily in an adequate universal soil mix.

What is fatal, or is inimical to healthy growth, is the aforesaid lack of light, excessive or too little moisture, overfeeding, excessive or injudicious use of poisons against pests, fungus or pathogens, a build up of chemicals deposited from long-watering from domestic water sources and the presence of destructive pests, and destructive fungi or pathogens.

Plants can be stunted, under-developed, sickly or weak if the pots in which they find themselves are too small, resulting in pot-bound roots.

Over-watering and insufficient light can cause unpleasant over-growth, loss of natural colour and can thus render the plants susceptible to attack by fungus or pathogens. Even where complete control of unwelcome infective organisms is practiced, lack of sufficient light will cause the plants to etiolate and lose their charming natural appearance; it may also prevent successful flowering. After all the ultimate goal of good cultivation is healthy plants retaining the appearance of being close to nature in so far as it is possible. There can be little satisfaction or enjoyment in possessing stunted, unnatural under-developed, sickly, shrivelled or etiolated specimens.

As mentioned above: growth medium and feeding, in particular for the more delicate specimens, are important factors, although most plants, even the most delicate, will thrive if a good universal soil mix is used. Horticulturists usually have their own particular standard mixes, all of which are probably perfectly satisfactory. Some modification by the use of such additives as lime, acid soil, more sand for greater aeration and bone-meal etc. for special cases is desirable. Delicate plants, with fine root structures, should be given finer sand for drainage than, for example, plants with thick tap roots.

The use of selective additives comes with practice and should not deter the amateur or beginner as it is not a vital factor in the successful build up of a basic collection. Of course, having said this, it is imperative that plants are fed, especially those confined to pots. Plants in the garden should likewise not be neglected. A guide to a suitable soil mix could be: equal parts of well-composted sieved commercial potting soil and relatively coarse sharp river (not beach) sand to aid in drainage. Where available add some pumice or pulverised volcanic soil. Some bone meal is also a valuable additive. It is, however, necessary to finally work out a soil mix which will suit your requirements. It is advisable to sterilise your potting soil as it may contain unwanted elements such as pests, nematodes, fungus etc.

I recall, when visiting a farm south of Brandvlei a number of years ago, next to a sheep pen I found a specimen of *Stapelia flavopurpurea* which was obviously benefitting by the abundance of the sheep's nutritious droppings. The remarkable plant was approximately 30 cm in height and covered with scores of flowers and obviously very healthy—if not too healthy. It was evident that this environment was most beneficial to the plant and although I do not advocate the addition of an excessive application of manure the addition of some well-rotted manure would greatly benefit certain plants. However be cautious as to which plants this is added as some genera, especially the highly succulent mesembs, thrive in highly mineralised sandy soil in which very little or no humus is present.

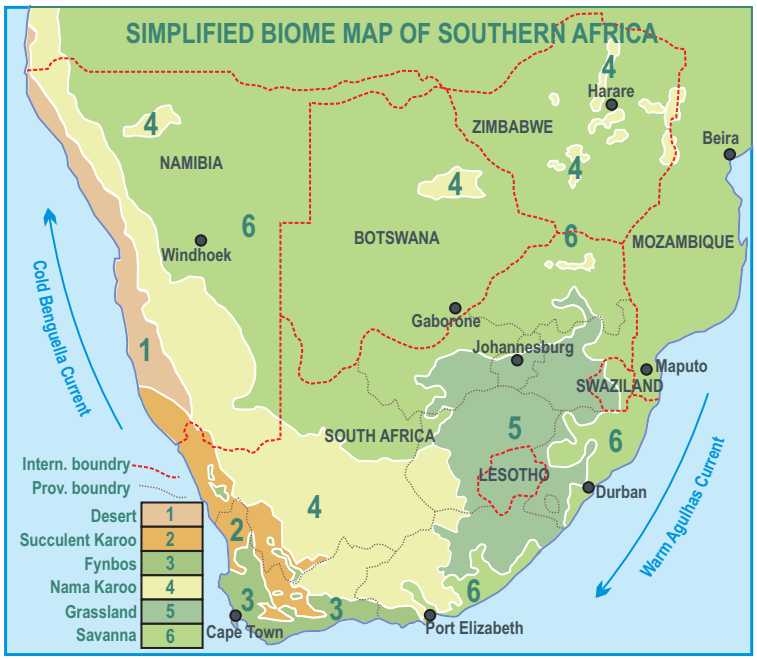
The age-old problem common to all cultivated plants, succulent or otherwise, is the *control of pests, fungal and pathogen infections* and the use of poisons to control these is sometimes necessary. For the control of insect pests, such as caterpillars, beetles etc., contact sprays are sometimes effective. For root infections and such creatures as woolly aphids, which have a waxy body protection, the use of a systemic poison is required. Fungal infections, which cause plants and seedlings to suddenly die off or become sickly, in these cases patent fungicides and anti-bacterial preparations are sometimes necessary.

With *watering* an important rule is to wait until the soil in a pot is almost dry before adding water. It is preferable to use rain water or filtered water as tap water usually contains unwanted chemicals, which may upset the soil's balance and form unsightly crusting. Some more delicate plants, such as *Lithops*, *Conophytum*, *Didymaotus*, *Dinteranthus*, *Gibbaeum*, to name a few, appreciate a fairly regular misting from a hand-held spray.

Although the use of chemical fertilizer is acceptable it is probably a better practice to use organic fertilizer. A fertilizer high in phosphorus for flowering and seed production, and potassium, essential for strong cell walls and strong outer skins, is recommended. I find that the use of a seaweed-based plant food, bolstered with a trace element medium is excellent.

Feeding of plants is important and should be carried out only during the period of active growth. It should be remembered that a great proportion of succulents in the subregion are inhabitants of the western Cape, which has a winter rainfall, as opposed to the rest of the country which has a summer rainfall period (see the accompanying map). The safest period for feeding the more delicate plants is in spring and autumn. If however the plants show active growth then it is safe to feed. Please be aware that is important that the plants are not over-fed.

The north western Cape and western Namibia are very arid regions, receiving almost no rainfall at all. Succulents from these regions thrive there because of the abundant fog rolling in off the cold north-flowing Benguela current and the consequent misting of the leaves. It would seem sensible therefore that plants in cultivation, especially, but not necessarily exclusively, the mesemb group (*Lithops, Conophytum, Argyroderma* etc.), could be given the major part of their moisture via spraying. It is however important not



Rainfall in Southern Africa is divided into summer and winter rainfall regions. The winter rainfall approximates with the Succulent Karoo and the Fynbos biome. Near the eastern boundary of the Succulent Karoo biome the summer rainfall overlaps somewhat with that of the winter rains. Summer rainfall is the pattern for the rest of the sub-continent. The greatest occurrence of succulent plants is within the Succulent Karoo biome. The Nama Karoo has a lesser sprinkling of highly succulent plants, but boasts the greatest numbers of the highly-succulent *Lithops*, *Faucaria*, *Titanopsis*, *Pleiospilos*, *Dinteranthus* and a number of *Conophytum.* Aloes predominate within the Grassland and Savanna biomes, although they are also present in all of the other biomes *Map by Robin Frandsen*

to let the soil dry out too much during the active growing season and an occasional light spray on very succulent plants is advised.

The best advice to the beginner or novice is to avoid being over-ambitious in the choice of plants, as injudicious selection of 'difficult' specimens can be a costly and frustrating exercise. It is advisable to be guided by the experts as to selection of 'beginner' plants. Having said this however even the highly succulent sections have many plants which are well suited for the beginner. These include some *Lithops*, *Faucaria*, *Haworthia,* of course *Aloe* and many others. As knowledge and experience increases, progression towards the more specialised and difficult specimens will be made and vastly enjoyed.

Growing plants from seed is both pleasurable and rewarding. A certain degree of patience is required but the results can be very rewarding indeed. For example a number of seedlings from the same seed capsule of a *Lithops*

can reveal a number of apical colour and pattern variations which can be evident even at a very early stage of their development. Seed of very many succulents may be available from certain specialised nurseries.

For successful propagation through seed there are several important factors. Of course some easily-propagated species can simply be sowed and watered to achieve growth. Some plants are best served by following several basic rules and methods: Large seeds—such as *Aloe* seeds—may be simply planted singly in small pots or containers but smaller seed, such as *Lithops* and fine seed, such as *Dinteranthus*, should not be simply scattered on the surface of the container, as this uneven distribution has its obvious defects. In this case it is suggested that the seed should be added to light sand, carefully mixed and then the resulting mix of soil and seed can be more evenly distributed on the top of the prepared soil.

Preparation of the soil mix is important. Soil should be sterilised, dampened and lightly and evenly tamped down, leaving the surface an approximate ½ cm from the rim. The seed and sand mix should then be applied and, in order to maintain the damp environment, covered with a pane of glass. Cling film would do just as well. The container should then be placed in a sheltered shady position. It is advisable to spray with a correctly formulated anti-fungus to avoid the 'damping off' of seedlings due to infection.

The seedlings develop fairly rapidly and within one to two years are ready for individual transplantation. Should the trays be overcrowded it may be necessary to thin the seedlings to prevent the developing plantlets from being forced out of the ground by pressure from their neighbours. The covering glass or cling film should be removed when the seedlings have gained colour and are sufficiently developed and do not need protection.

Seedlings should be regularly misted or watered from below (filling the saucers on which the containers are resting thus allowing the water to percolate upwards). Much less water should be supplied in the plants' resting period.

CONSERVATION: Of importance are the many rules governing the conservation of our flora. This, of course, applies to all groups of plants. CITES , the acronym for the Convention on International Trade in Endangered Species, is an international agreement between governments, with the aim of ensuring that international trade in specimens of wild animals and plants does not threaten their survival. A number of southern African succulent plants fall under this category. Furthermore the provincial and governmental conservation authorities in the region have their own rules and regulations governing the removal, trade and transportation of plants within and across their borders. In South Africa these rules can be quite draconian and sometimes quite inexplicable. For example it is illegal to transport certain plants across national or provincial borders, even if the plants are not field collected, or from a garden or even if donated by a friend. Plants exported or imported have also to be supplied with a phytosanitary certificate issued by the competent authority.

It is essential that those wishing to purchase plants, should do so from a reputable source which is well-versed in the rules governing the supply of the desired plants. See the recommended list of organisations at the end of this Introduction.

It is fortunate that there are such organisations from which information is available as to where such plants are available. This information should be simply obtained from the internet.

SOME NOTES ON TAXONOMY: As it is perfectly acceptable in the rules of taxonomy that concepts are a matter of choice I have, in this work, not accepted a number of taxonomic changes which have seen the disappearance of a number of genera and the sinking of a number of species into subspecies or varieties of existing species. In the genus *Aloe* some taxonomists have seen fit to rearrange a number of species into subspecies or varieties, and in the stapeliads some taxonomists have scrapped a number of genera and their members have consequently found their way into existing genera which has been done to accommodate the concepts of cladesticians. I have opted as a preference to retain these genera and to maintain their taxa.

SUCCULENTS IN HABITAT: The following four pages illustrate the attractiveness of the plants in habitat. The succulent flora of southern Africa occurs in a wide variety of habitats from true desert to bushveld. Obviously the largest populations are in desert and semi-desert conditions. The succulent mesembs, euphorbias, stapeliads and other very succulent species are represented in an enormous diversity



Sarcocaulon multifidum in habitat flowering in severe desert conditions.
Photo Gerhard Beukes



Sarcocaulon peniculinum severely stressed but still flowering under the harsh sun of the Namib Desert in the Sperrgebiet
Photo Gerhard Beukes



Aloidendron dichotomum In habitat in the Richtersveld, north western Cape
Photo Tim Peatling



Aloe chortoliroides in habitat in Mpumalanga grasslands. This species flowers prolifically after veld-burning
Photo Judd Kirkel Welwitch

Hoodia alstonii in habitat near Oena in the Richtersveld National Park after rare good rains
Photo Gerhard Beukes





Muiria hortenseae in habitat of quartz pebble fields. It is of limited distribution at Springfontein in the Little Karoo *Photo Robin Frandsen*



Tridentia pachyrrhiza in habitat in the central western Richtersveld *Photo Judd Kirkel Welwitch*



Orbea umbracula in habitat in open stubby grass tussocks about 45km south of Mutare, Zimbabwe *Photo Judd Kirkel Welwitch*



Euphorbia multiramosa in habitat south of Vioolsdrif, eastern Richtersveld showing an interesting cluster of three plants, *Photo Robin Frandsen*

Lithops lesliei in habitat in the grasslands around Johannesburg. *Photo Darrel Plowes*



Adenium oleifolium flowering in habitat within sight of Upington on a smallholding east of the town *Photo Judd Kirkel Welwitch*





Hoodia parviflora in habitat in N Kaokoveld, N Namibia
Photo Len Petzer



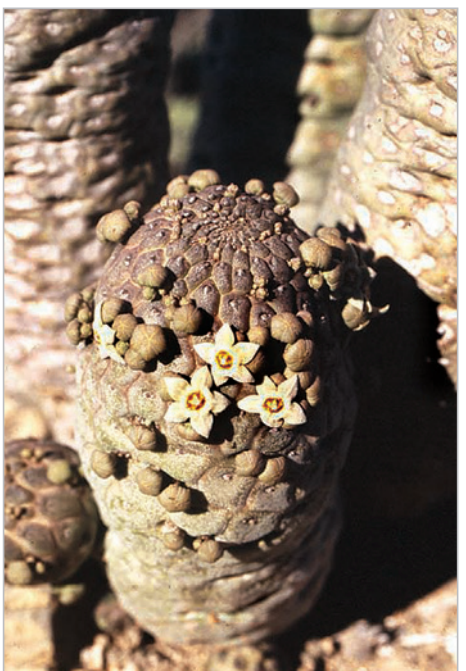
Haworthia emelyae in habitat at Witkliprug, S of Oudtshoorn, Little Karoo
Photo Kuba Jilemicky



Pachypodium namaquanum in habitat in N Richtersveld *Photo Gerhard Beukes*



Euphorbia schoenlandii in habitat near Vanrhynsdorp
Photo Gerhard Beukes



Larryleachia perlata in habitat on the Helshoogte, Richtersveld National Park
Photo Robin Frandsen



Haworthia arachnoidea in habitat at Bellevue, SW Cape
Photo Kuba Jilemicky



Euphorbia pillansii in association with ***Gibbaeum heathii***
in habitat about 20 km N of Garcia Pass, Little Karoo
Photo Robin Frandsen



Ihlenfeldtia excavata (right) in association with ***Stomatium alboroseum***
in habitat about 35 km N of Steinkopf *Photo Robin Frandsen*

Aristoaloe aristata in habitat in th SW KwaZulu-Natal
Photo Judd Kirkel Welwitch



Hoodia flava in habitat, 65 km W of Beaufort West
Photo Darrel Plowes



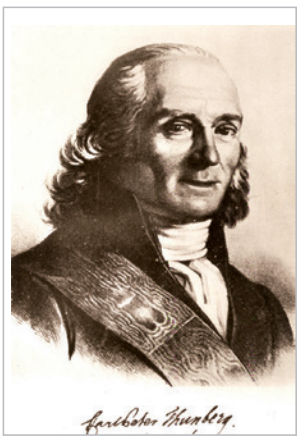
in the driest parts of the western Namibian deserts, the dry Namaqualand and the drier parts of the southern and eastern Cape. The aloes are widespread in a very varied habitat range. The search for succulents is a fascinating pastime and these pictures of plants in their very diverse habitats gives some examples of the fascination of seeing and photographing the succulents in habitat growing to their full glory.

Biographies: It is appropriate in a work of this nature to include a short biography of major players in the fields of taxonomy, conservation and promotion of this group of plants. This section will begin with the father of binomial classification, Carl Linnaeus:

Carolus (Carl) Linnaeus (1707—78) Born in Sweden, Carl Linnaeus is known as the father of binomial nomenclature. Succulent plant literature will reveal genera and many succulent species which were defined and described by Linnaeus, the letter 'L' designating his authorship.

Francis Masson (1741—1805) Born in Scotland. Masson was a gardener and a traveller. He joined the staff of Kew Gardens and, on the advice of Sir Joseph Banks, was sent with the agreement of the King to collect seeds and plants in the Cape. Masson travelled extensively in South Africa and was probably the first Englishman to travel in many of these regions. His only publication *Stapeliae Novae* contains 41 illustrations of stapeliads. It was dedicated to King George III. He is celebrated in the genus *Massonia* and a few species were named after him.

Carl Pehr (Peter) Thunberg (1743—1828) Born in Sweden Thunberg was a physician and botanist. During his studies at Uppsala University he became Linnaeus' favourite student. In c.1773 he undertook three extensive expeditions into previously botanically unexplored regions of the Cape hinterland. Among his publications was his *Flora Capensis*, which was published between 1807 and 1820. He is celebrated in two genera, *Thunbergia* and *Thunbergiella* and in many species.



Carl Pehr Thunberg



Adrian Hardy Haworth

Adrian Hardy Haworth (1767—1833) Born in Hull, England. He was a Fellow of the Linnean Society and was aided in his study of botany with the use of the library and herbarium of his friend Sir Joseph Banks. The genus *Haworthia* is named for him as well as several plant species.

Nicholas Edward Brown (1849—1934) Born in Surrey, Brown was a botanist who joined the staff of Kew Gardens in 1849. He never visited South Africa but made a great



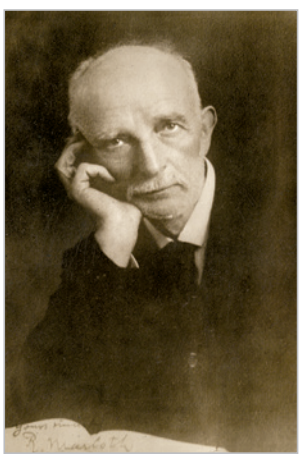
Carolus (Carl) Linneaus



Francis Masson



Nicholas Edward Brown



Hermann Wilhelm Rudolph Marloth

contribution to several genera of South African plants, among which were the Asclepiadaceae and Mesembryanthemaceae. In 1921 he was awarded the Captain Scott Memorial Medal for service to South African flora and an honorary doctorate was awarded him from the University of Witwatersrand. The genus *Brownanthus* and the Araceae genus *Nebrownia* was named for him.

Hermann Wilhelm Rudolph Marloth (1855—1931) Born in Lübben in Germany, Marloth was a pharmacist, analytical chemist and botanist. He travelled extensively in the western part of South Africa and accumulated an impressive herbarium collection. He is best-known for his beautifully illustrated 6-volume *Flora of South Africa*. He is commemorated in the genera *Marlothia, Marlothiella, Marlothistella,* and a number of species names.

Moritz Kurt Dinter (1868—1945) Born in Saxony, Germany, Dinter emigrated to South West Africa (Namibia) in 1897. He was married to Helena Jutta Schilde, who assisted greatly in his botanising. Jutta Dinter is commemorated in the genus *Juttadinteria*. Dinter botanised in South West Africa for many years, specialising in succulent plants. He discovered and described many species. He collaborated extensively with Schwantes. He is commemorated in the genus *Dinteranthus* and in a number of succulent species.

Henry Harold Welch Pearson (1870—1916) Born in Lincolnshire, England, Harold Pearson emigrated in ca. 1903. He became director of the new National Botanic Gardens at Kirstenbosch in 1913. He botanised the western Cape and into South West Africa, where he developed a great interest in the remarkable *Welwitschia mirabilis*. He is commemorated in the non-succulent genus *Pearsonii* and several other succulent species. His grave is in Kirstenbosch.



Kurt & Jutta Dinter



Harold Pearson

Friedrich Richard Rudolph Schlechter (1872—1925) Born in Berlin, Germany, Rudolph Schlechter emigrated to South Africa in c.1892. He collaborated with Hans Schinz in Zürich to whom he sent some 7000 specimens of his many collections. He collected extensively throughout South Africa. He produced a large number of scientific papers dealing chiefly with the Orchidaceae and Asclepiadaceae and is commemorated in the non-succulent genera *Schlecterina, Schlecterosciadium* and a number of succulent and non-succulent species. In 1896 he brought his brother Max Schlecter out to South Africa to accompany him on his travels. Max Schlechter is commemorated in the succulent genus *Schlechteranthus*.



Friedrich Schlechter

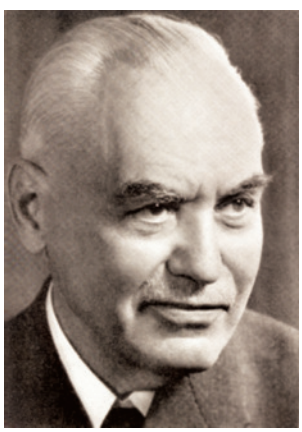


Louisa Bolus

Harriet Margaret Louisa Bolus (1877—1970) Louisa Kensit was born in Burgersdorp and married Frank Bolus. She was awarded a doctorate of science by Stellenbosch University in 1942. She was appointed by her uncle Harry Bolus as curator of his private herbarium which was later bequeathed to the University of Cape Town as the Bolus Herbarium. Margaret Louisa Bolus worked at the Bolus Herbarium in Cape Town on her own system of organising the Mesembryanthemaceae family and described an enormous number of species. Many of her species have been transferred to other genera or have been found to be synonymous with existing taxa. She spent over 60 years on

study of the mesembs, and worked until she was 90 years of age. Mrs Bolus is commemorated in the genus *Bolusanthemum* and in a number of species.

Martin Heinrich Gustav Schwantes (1881—1960) Born in Bleckede, Germany. He studied ethnology, geology and botany. Although he never did visit South Africa he worked extensively with South African succulents. His work on the genus *Lithops* brought him into acrimonius conflict with N.E. Brown. He also went into further taxonomic rivalry with Mrs Louisa Bolus. Schwantes had an abiding interest in *Lithops* and *Conophytum*. He was the author of the well-known '*Flowering Stones and Midday Flowers*'. He is commemorated in the succulent genus *Schwantesia.*



Gustav Schwantes



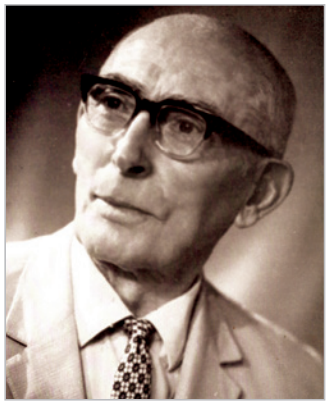
Neville Pillans

Neville Stuart Pillans (1884—1964) Born in Cape Town he is recorded in 1911, as a young man, who introduced Henry Pearson to the future site of Kirstenbosch Botanic Gardens. While still at school he built up a collection of indigenous plants, especially succulents. N.E. Brown is recorded as stating that "Pillans was the most eminent collector of stapeliads in the eventful history of that tribe". Pillans joined the staff of the Bolus Herbarium in 1918. His name is commemorated in the non-succulent geophyte genus *Pillansia* and many species names.

Gert Cornelius Nel (1885—1950) Born in Greytown, Natal, Nel was a teacher in a number of colleges. He was eventually appointed as Professor of Botany at Stellenbosch University. Hans Herre assisted him in developing a keen interest in succulent plants, describing several stapeliads and euphorbias. He subsequently majored in mesembs, producing the book '*The Gibbaeum Handbook*' and later his Magnum Opus '*Lithops*'. He is commemorated in the genus *Nelia* and several succulent species were named for him.



Gert Cornelius Nel



Hendrik de Boer

Hendrik Wijbrand de Boer (1885-1970) Born in the province of Groningen in Holland. He was an eminent chemist and his hobby was the cultivation of mesembs, in particular *Lithops* and *Conophytum*. As a result of his hobby he was befriended by Professor Desmond Cole and they finally met in 1961. After his retirement in 1950 his hobby became a scientific study of, in particular, *Lithops*. He never visited South Africa. He is commemorated in *Lithops deboeri*.

Arthur Tischer (1895—2000) When Tischer was young he developed an interest in cacti and succulents and from 1920 he worked on the mesembs. Arthur Tischer contributed immensely to the understanding of *Conophytum*. This genus was his special interest. He built up a collection of over 1200 specimens, comprising about 200 species and varieties. He eventually donated this



Arthur Tischer



Adolar-Gottlieb Julius Herre

collection to the Botanic Garden of the University of Heidelberg, Germany. He wrote an unpublished thesis on the genus. Tischer lived to a great age. He is commemorated in a number of species names.

Adolar-Gottlieb Julius (Hans) Herre 1895—1979) Hans Herre was born in Dessau, Germany. He was curator of the University of Stellenbosch botanical gardens from 1925 to 1963. Here he cultivated his many collections from his expeditions to the Karoo, Richtersveld and South West Africa. His collections were mainly succulents. He published articles on succulent plants in many journals and his '*The Genera of the Mesembryanthemaceae*', published in 1971, was the culmination of his work on succulent plants. He is commemorated in the genera *Herrea* (=*Conicosia*) and *Herreanthus* (=*Conophytum*) and many species names.

Gilbert Westacot Reynolds (1895—1967) Born in Victoria, Western Australia, Gilbert Reynolds emigrated to Johannes-burg in 1902. He was by profession an optometrist, but his abiding passion was the genus *Aloe*. He travelled extensiv-ely in southern Africa, Angola, Madagascar, East Africa and as far north as N. Sudan, making a point of studying the genus in the field. He produced his book, which has been the leading publication on the genus, '*The Aloes of South Africa*' in 1950. He travelled many thousands of kilometers in pursuit of his passion. Two books followed '*Les Aloes de Madagascar*' and 'The *Aloes of Tropical Africa and Madagascar*'. He was awarded an honorary doctorate from the University of Cape Town plus other important awards. He is commemorated in the names of a number of plant species.

Hermann Johannes Heinrich Jacobsen (1898—1978) In Germany he was involved in horticulture at various botanic gardens. At the botanic garden in Bonn he was first introduced to succulents. In Kiel he cultivated the famous succulent collection of Derenberg-Dinter and Schwantes, which Schwantes had handed over to the garden. At this stage Jacobsen began his passion for producing books on succulent plants. He also assisted Schwantes in the classification of the Mesembryanthemaceae. His best-known work is the three-volume '*Handbook of Succulent Plants*'. He is commemorated in the genus *Jacobsenia*. and several species are named for him.

Robert Allen Dyer (1900—1987) Born in Pietermaritz-burg, he had a long and distinguished career as a scientist and botanist. His varied career was as a botanist at the Division of Botany at Grahamstown, as curator of the Albany Museum Herbarium stationed at the Royal Botanic gardens at Kew and Later he was appointed as Director of the Botanic Research Institute in Pretoria. He published extensively and, in the succulent plant genre, he described very many taxa. He co-authored with White & Sloane the *Succulent Euphorbieae.* He also collaborated in White & Sloane's *The Stapelieae*. He was the author of the monograph *Ceropegia, Brachystelma* and *Riocreuxia.* He was also a Fellow of the F.R.S.S.Afr. and a Fellow of the American Cactus & Succulent Society. He was President of the S.A. Biological Society and also President of the S.A. Association for the Adv. of Science. Allen Dyer was honoured by the S.A. Succulent Society with the naming of its Award, The Allen Dyer Award. He is commemorated in the names of a number of plant species.


Gilbert Reynolds


Hermann Jacobsen


Allen Dyer


Harry Hall

Harry Hall (1906—1986) Born in Macclesfield, England. He was a skilled horticulturist and botanist. He was employed in England and Italy as a curator of botanical gardens. He emigrated to South Africa in 1947 where he joined the staff of Kirstenbosch and was appointed senior horticulturist of the succulent section, which he held up to his retirement in 1968. He botanised for succulents in Namaqualand, South West Africa and Zimbabwe. He contributed to the literature on succulents with the emphasis on botanical exploration. He is commemorated in the genus *Hallianthus* and many species names.

Leslie (Larry) Charles Leach (1909—1996) Born in Sussex, Larry Leach immigrated to Southern Rhodesia where he developed an interest in the succulent plants of the region. After the death of his wife in 1956 he decided to become a full-time botanist, majoring in succulent plant taxonomy. His first love was for the genera of aloes, euphorbias and stapeliads. He immigrated to South Africa in 1982. In his lifetime he described in excess of 100 new species and his name is honoured in several species and in the genus *Larryleachia*. Larry Leach was a recipient of the Succulent Society of South Africa's Allen Dyer Award.

Charles Leslie Scott (1913—?) Scotty, as he was affectionately known, was born in Oudtshoorn, South Africa. By profession he was a policeman, rising to the rank of Colonel. His passion was for the genus *Haworthia* and he produced the well-known book '*The Genus Haworthia, a Taxonomic Revision*' published in 1985.



Leslie Leach



Charles Scott

Carl August Lückhoff (1914 —1961) Carl Lückhoff was a medical practitioner, naturalist and painter. He was born in Cape Town where he lived for his entire life. As a friend of Marloth and Mrs Bolus he collected many plant specimens for them. He specialised in the Stapelieae, producing a well-known volume of stapeliad photographs 'Stapelieae of Southern Africa'. He also described several species in the group in semi-popular journals. He is commemorated, together with his father in the genus *Luckhoffia*.



Carl August Lückhoff



Desmond and Naureen Cole

Desmond Thorne Cole (1922—) Des Cole was born in Mafeking. He was an academic and his work was at the University of the Witwatersrand where he was a lecturer from 1949 to 1953 in Bantu languages. He was appointed as Professor from 1954 and was awarded a honorary doctorate from the University of Witwatersrand in 1987. His introduction to *Lithops* was when he discovered a few of the plants in a florist's shop. This ignited a lifetime passion in him, and he began to search for any information he could about these fascinating little plants. He soon built up a large collection of *Lithops*, and searched for as much information as he could find on them. He became friends with Hendrik de Boer, eventually meeting him in 1961. Over a period of 50 years, Desmond and his wife Naureen, spent all their spare time and much of their financial resources learning about these plants. They spent many days travelling around Southern Africa in search of plants in their natural habitats, and eventually ended up visiting over 450 different localities. At each locality, they collected plants, seeds, rock and soil, which they took back to their "Lithoparium". They then began a detailed study of the various plants, which led to the publication of *Lithops*: *Flowering Stones*, which is regarded as

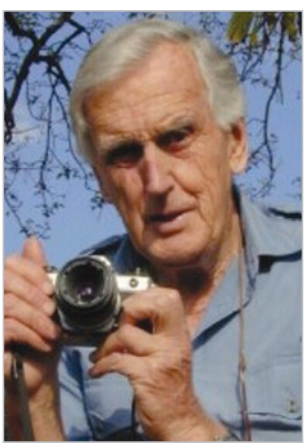
the definitive work. Des published extensively on the subject and the latest addition is his and Naureen's second updated *Lithops*, *Flowering Stones* He and Naureen are commemorated in the species *Lithops coleorum* and *Hoodia coleorum*.

Darrel C.H. Plowes (1925—2016) Darrel was born in Estcourt in KwaZulu-Natal and was educated at the Witwatersrand University. He majored for the rest of his working life on many facets of nature, prospecting and ecological research throughout Africa. He majored on agricultural and land development, serving as Extension Officer in far-flung regions of north Africa, where he was able to do extensive field work on plants, especially on the stapeliads. His hobbies and interests included photography, birds, succulent plants, botany, butterflies, orchids, mammals, fish, reptiles, archaeology and palaeontology, prehistoric rock art, insects, etc., together with a deep and lifelong concern for ecological and environmental matters. His contribution to science through discovery and literature is extensive. He has been honoured in the awarding of the Bronze Medal First Prize South African Documentary Film Festival for the film 'Black Eagle Fly Free' and is a Fellow of both the American and the Zimbabwe Cactus and Succulent Societies. He has described several new genera and many new stapeliad species; he discovered *Huernia plowesii*. Darrel lived in Mutare, Zimbabwe. The continuation of his production of a comprehensive illustrated Stapeliad Checklist is planned for completion as a project between his son Rob and Robin Frandsen.

John Jacob Lavranos (1926—) John was born in Corfu, Greece. He is best known as a botanical explorer having travelled very extensively throughout Africa, particularly north eastern Africa, and Arabia. He discovered and described very many new species, in particular from the Asclepiad, Aloe and other succulent groups, from remote and botanically unexplored places. In his spare time, in pursuit of his botanical interest, he obtained his degrees of B.Sc. and M.Sc. from the University of the Witwatersrand, Johannesburg. He has published extensively and is commemorated in the genus *Lavrania* and a number of species names.

David Spencer Hardy (1931—1998) Dave was born in Pretoria. His early career was as a technician in the Veterinary Research Institute. He transferred to the Division of Botany, which later became the Botanic Research Institute and now changed to the National Botanic Institute. He was involved for essentially the rest of his life in the plant nursery at the BRI. Dave made extensive botanical explorations throughout the succulent plant areas of southern Africa, his favourite trips, however, were to his beloved Madagascar, which enabled him to build up an impressive collection of the plants of that island. He is celebrated in several species names. He was long associated with the Succulent Society of South Africa and was awarded the society's Allen Dyer Award.

Hans-Dieter Ihlenfeldt (1932—) Prof. Dr Ihlenfeldt was born in Kiel in Germany. He is professor of botany at the Staatsinstitut für Allgemeine Botanik in Hamburg. Ihlenfeldt has contributed extensively towards the morphology of the Mesembryanthemaceae and has worked extensively with Heidi Hartmann. He is celebrated in the genus *Ihlenfeldtia*.



Darrel Plowes



John Lavranos



Hans-Dieter Ihlenfeldt



Dave Hardy

Graham Williamson (1932—) Graham was born in Harare, Zimbabwe. His interest in plants and drawing began at the age of seven years and has endured to the present. He has specialised in indigenous orchids and various succulent plant genera and has authored the books *The Orchids of South Central Africa* (1978) and *Richtersveld, the Enchanted Wilderness* (2000) plus numerous descriptions of new species and articles both popular and scientific. He has lectured worldwide and with his wife, have had several plants named in their honour. Graham's wife Françoise (1935 -) was born in Maputo. She is Swiss-French. Françoise was part of and the organiser of all their later expeditions. Presently Graham works as a botanist and is an Honorary Research Associate at the Bolus Herbarium, University of Cape Town. He is a recipient of the Bolus Medal of the Botanical Society of S. Africa, the Robert Allen Dyer Medal, of the Succulent Society of South Africa and is a Fellow of the Cactus and Succulent Society of America.



Graham & Françoise Williamson

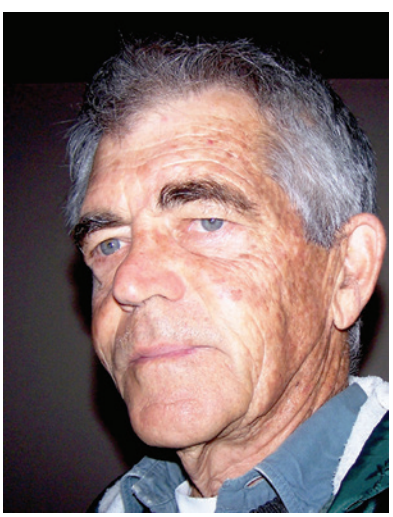
Robin Max Ivan Frandsen (1935—) Robin was born in Heidelberg in the then Transvaal, South Africa. From an early age he has had an interest in all forms of nature. This eventually led to an abiding interest in the fascinating succulent flora of the region. He has written a number of articles on succulent plants, in particular on mesembs and stapeliads. For much of his business life Robin has been involved with printing and publishing, ultimately leading to the formation of a publishing company publishing a wide variety of natural history books. With his wife Joy, they have published and produced a number of important books on



Robin Frandsen

South African flora. Their first publication was the facsimile copy of Baron Nicholas von Jacquin's *The Stapeliae*. Among other important botanical books published and produced are Auriol Batten's *Flowers of Southern Africa*, John & Sandy Burrows *The Ferns & Fern Allies of Southern Africa* and Steven Hammer's *The Genus Conophytum*. He is the author, designer and producer of this book, and has been collaborating with the late Darrel Plowes in the production of Darrel's comprehensive illustrated stapeliad checklist. Notwithstanding Darrel's sad passing the Checklist is still planned to be completed.

Martin Bruce Bayer (1935—) Bruce was born in Empangeni Kwazulu-Natal. He graduated as an Agricultural Entomologist but made several career changes before spending 18 years at the Karoo Botanic Garden at Worcester. With a wide interest and love for plants he was particularly drawn into the classification of *Haworthia*. He acquired a very wide knowledge



Bruce Bayer

of plants and this led to his generating a different concept of species and their Latin names. He initially produced a simple Handbook to reduce the long list of extant *Haworthia* names to a manageable number and then wrote a formal revision in 1999. He spent the next ten years refining the concepts through field work which culminated in 6 volumes of updates. He is commemorated in several plant names.



Loukie Viljoen

Johannes Lodovicus (Loukie) Viljoen (1936--) Loukie was born in Johannesburg RSA, grew up in Polokwane (Pietersburg) graduated BDS (Rand) in dentistry in 1958. His interest in the stapeliads and other succulents came by chance through buying a little book on succulents at the Central News Agency. It had an address in it - a Mr Otto. Loukie phoned him to see his plant collection and there he saw his first Asclepiad. Mr Otto referred him to a Mr Akker Horstemke, a noted succulentophile, who lived close by in Johannesburg. A long friendship started which revolved around plants. Since the age of 6 Loukie was interested in photography and this naturally led to the photographing of Stapeliads. He was chairman of Operation Wildflower for about six years. With Fabio d'Álesii in Italy he has developed a website www.stapeliads.info dedicated to a worldwide membership of those interested in this group. He now keeps himself busy with servicing the website and with his photography.

Heidrun (Heidi) Elsbeth Klara Hartmann (1942—) Heidi Hartmann was born in Kolberg, Germany. She has contributed about 120 papers and two books, *Handbook of Succulent Plants - Aizoaceae to the systematics, taxonomy, ecology, and phylogenetics of the Aizoaceae, including Mesembryanthema*, based on 39 years of extensive field work from the Cape of Good Hope to northern Ethiopia, and on other continents. She was a member of staff in the function of a professor at the Institut für Allgemeine Botanik in Hamburg until she retired in 2007 and continues working in her field.



Heidi Hartmann



Ernst van Jaarsveld

Ernst Jacobus van Jaarsveld (1953—) Ernst was born in Johannesburg and is at present a horticulturist at Kirstenbosch Botanical Garden since 1976. His interests are the aloe, crassula and mesemb families and general ecological gardening. He is the author or co-author of several books on succulents and waterwise gardening. He has a weekly column in an Afrikaans newspaper, helping with gardening and other problems. He is a keen field explorer and the author or co-author of about 100 new plant taxa. He was awarded the Senior Captain Scott medal by the Academy of Science of South Africa for his research on South African plants, the Dudley D'Ewes medal from the Botanical Society for the promotion of South African plants. the Hans Herre medal from the Succulent Society of South Africa and the NBI Chairmans Award 1996 for his work in the Botanical Society conservatory. He is the curator of the Botanical Society conservatory.

Steven Hammer (1951—) Steven Hammer, from the U.S.A., was originally a pianist by profession. He became interested in *Lithops* soon after his first encounter with them when he was only 11 years old. His passion for *Lithops*, as well as many other members of the Mesembryanthemaceae family,



Steve Hammer

soon took centre stage, and he dedicated his time to learning as much as he could about them. He travelled to Southern Africa on numerous occasions in his quest for knowledge of succulents. He has written many articles on the topic, including his three books: *The Genus Conophytum, Dumpling and His Wife—a new view of the genus Conophytum,* and *Lithops Treasures of the Veld*. His many travels eventually led him to the discovery of a number of new species, in particular, the genus *Conophytum*.

Johan Gerhardus Marx (1956 —) Gerhard was born in Germiston, Gauteng. He studied Fine Art at University of Pretoria. From 1984 to 1999 he was employed as exhibitions artist at the Albany Museum in Grahamstown where his two and three dimensional reconstructions of prehistoric animals stand out amongst his productive output during this period. Afterwards he moved to the USA where he worked as propagator and artist at Arid Lands Greenhouses in Tucson, AZ., USA for three years before returning to South Africa. He is currently living in the Little Karoo where he works as freelance botanical illustrator and amateur succulent botanist. Ever since 1984 he has been a prolific producer of both succulent artwork and published articles for various international succulent journals. Apart from formally publishing some new species of succulent *Euphorbia*, he has also been honoured in the naming of *Haworthia marxii*.



Gerhard Marx



Alma Moller & Rolf Becker

Rolf Werner Becker (1959—), **Alma Moller** (1954–) Rolf and Alma have done extensive research on the euphorbias of southern Africa, working with the University of Michigan on the Euphorbia Planetary Diversity (PBI) which was funded by the U.S. National Science Foundation.

Burgoyne, Priscilla Merle (1964—) Priscilla was born in Germiston and educated at the University of Pretoria 1983-1985, graduating B.Sc., majoring in Botany and Zoology with Geology as an extra subject, B.Sc. (Hons) (1986) and later an M.Sc. in plant ecology. The last named was a phyto-sociological study of high-altitude grasslands of the former Transvaal. She started her taxonomic career at the then National Botanical Institute in 1992 where she specialised in taxonomic studies of the succulent plant families Mesembryanthemaceae, Crassulaceae and Portulacaceae, and published extensively in this area. Priscilla is currently the Curator of the Southern Cape Herbarium in George.

Herbarium specimens number over 12000, which are housed at PRU and PRE. She has the dubious distinction of


Priscilla Burgoyne


Judd Kirkel Welwitch

being the only woman to have collected over 1200 specimens in her travels on a motorbike.

Judd Kirkel Welwitch (1973—) Judd was born in Johannesburg. He has dedicated his life and art to depicting the world of indigenous plants and flowers. His plant hunting and photography, have lead him to remote parts all over Southern Africa. A well known speaker on all groups of Southern African plants, he has delivered numerous presentations on the subject. He publishes in various periodicals and is a member of 11 botanical and nature related societies. Judd is also a tour operator for botanical tours throughout southern Africa.

Jakub (Kuba) Jilemicky (1980—) Kuba was born in Prague (Czech Republic) he is a university graduate in International Territorial studies, majoring in tourism. His diploma work was on specifics of South African tourism which led to his interest in the study of the South African genera *Haworthia*, *Gasteria* and *Astroloba* in which field he has been involved for a number of years. He spent more than a year in South Africa and since then he visits the country regularly. He has travelled in other southern African countries - Namibia, Botswana, Zambia and Zimbabwe, sometimes as a tour guide. He has a well known web site - www.haworthia-gasteria.com, which is dedicated to the genera *Haworthia* and *Gasteria*.



Kuba Jilemicky

Information: There are several important succulent plant societies, information on which is freely available on the internet. The principal organisation relative to southern African succulents is the Succulent Society of South Africa. Its journal 'Aloe' is internationally known and appreciated:

Succulent Society of South Africa
E-mail: gasteria@mweb.co.za
Website: www.succulentsociety.co.za

Gariep Plants - The largest succulent plant nursery in the region:
E-mail: gariep@kambroo.com
Website: www.kambroo.com
Gariep Plants is also the home of Euclea Books, which carries a large range of botanical literature and specialises in books on succulent plants.

Other important overseas succulent plant societies and groups are listed as follows:

British Cactus & Succulent Society
E-mail: dslade@bcss.freeserve.co.uk
Website: www.bcss.org.uk
Three other British societies specialising mainly in the succulent plants of the region are The Mesemb Study Group, which is dedicated to the Mesembryanthemum (mesembs) group, Alsterworthia International, established for the study of the genera *Aloe, Haworthia* and *Gasteria* and the International Asclepiad Society, which encourages the study and knowledge of the Asclepiadaceae (Stapeliads, cero-pegias, brachystelmas etc.)

The Cactus & Succulent Society of America
E-mail: cssa@hughes.net
Website: www.cssainc.org

The International Asclepiad Society
E-mail: plantsman@tiscali.co.uk
Website: www.asclepiad-international.org
The Society is the publisher of the journal *Asklepios*.

International Euphorbia Society
E-mail; plantsman@tiscali.co.uk

Website: www.euphorbia-international.org

The Society publishes the journal *Euphorbia World*.

The Haworthia Society

29, Sunset Avenue, North Chingford, LONDON, E4 7LW, U.K.

Email: jackson.343@btinternet.com

Alsterworthia Society

Email: hmays@freenetname.co.uk

Mesemb Study Group

E-mail: msg@mesemb.org

Website: www.mesemb.org

The Group publishes a quarterly bulletin.

Design and text style: The textual style and content of this work avoids the standards adopted by most similar books, where the plant descriptions slavishly follow a set style and pattern, and which, in the opinion of this author, tends to make their perusal somewhat boring. The descriptions of the taxa throughout does, therefore, not follow a set pattern but rather, through its diffuse style, attempts to make its reading more interesting and enjoyable. This factor may annoy some reviewers, but so be it.

I have been obliged in producing the book to sacrifice some of the usually acceptable design functions in order to have the photographs as large as possible.

In designing and producing the work, I have avoided the old fashioned and irritating design feature, where the illustrations are confined to fascicles and the reader is obliged to seek these out when perusing the contents. Each plant discussed is represented by at least one picture, which is illustrated on the same page spread.

Some comments on taxonomy: Unfortunately, in the opinion of some, there has been an active movement by some workers to incorporate various genera or species into other related genera based solely upon common ancestry as revealed by the analyses of various DNA marker sites. This has had the effect of merging together visibly different groups of taxa, instead of retaining the long-standing criterion of using morphological features for their separation and classification. This approach to classification can be been seen for example by the recent incorporation of *Sarcocaulon* into *Monsonia*, and in the recent move which has divided and re-allocated the genera *Haworthia*, *Gasteria*, *Chortolirion*, and *Poellnitzia* into other genera. This criterion is also impacting somewhat on the genera of the Stapelieae, where, if the principle is applied very stringently, it could perhaps result in the bizzare situation where all of its genera could ultimately be subsumed into just one genus—*Ceropegia*. Who knows where this plunge into nomenclatural madness could end if morphology is ignored and phylogenetic considerations are allowed to override the differences and divergences that evolution and adaptation have brought about.



Aloe claviflora in habitat
photo Gerhard Beukes



South Western, Western Cape & Southern Namibia

A1 Aalwynsfontein **D2, C3**
A2 Anenous Pass **B2**
A3 Annisfontein **B2**
A4 Aurora **C4**
A5 Bowesdorp **B3**
A6 Brakfontein **C3**
A7 Bulletrap **B2**
A8 Chabiesies **B2**
A9 Chamies **A1**
B1 Concordia **B2**
B2 De Hoop **B2**
B3 Doornpoort **B2**
B4 Doorn River **C4**
B5 Doringbaai **C4**
B6 Doringbos **C4**
B7 Eendoorn **C2**
B8 Eenriet **B2**
B9 Eksteenfontein **B2**
C1 Elands Bay **C4**
C2 Eselfontein **B3**
C3 Geselskapbank **C2**
C4 Groenrivier **B3**
C6 Grootmis **B2**
C7 Haalenberg **A1**
C8 Henkries **B2**
C9 Holbank **C4**
D1 Holgat **B2**
D2 Holrivier **C4**
D3 Hondeklipbaai
D4 Houmoed **C2, C4**
D5 Jakkalswater **C4**
D6 Kangnas **B2**
D7 Karoopoort **C4**
D8 Karrachabpoort **B2**
D8 Kharkams **B3**
E1 Khubus **B2**
E2 Kinderlê **B2**
E3 Klipbok **B2**
E4 Kliprand **C3**
E5 Koekenaap **C4**
E6 Koingnaas **B3**
E7 Komkans **C3**
E8 Kommagas **B3**
E9 Koringhuis
F1 Koringnaas **B3**
F2 Kosies **B2**
F3 Kotzesrus **B3**
F4 Kouberg **C3**
F5 Kouefontein **B2**
F6 Koup **D4**
F7 Lamberts Bay **C4**
F8 Lekkersing **B2**
F9 Leliefontein **B3**
G1 Lemoenhoek **D5**
G2 Leipoldville **C4**
G3 Lorelei **B2**
G4 Mesklip **B3**
G5 Messelpad **B3**
G6 Middelpos **D4**
G7 Nababeep **B2**
G8 Naip **B2**
G9 Namies **C2**
H1 Nigramoep **B2**
H2 Numees **B2**
H3 Pakhuis **C4**
H4 Papendorp **C4**
H5 Paternoster **C4**
H6 Platbakkies **C3**
H7 Ratelpoort **B2**
H8 Riethuis **B3**
H9 Rooifontein **C3**
J1 Sendelingdrift **B2**
J2 Silverfontein **B2**
J3 Skilpad **B3**
J4 Skitterykloof **C4**
J5 Smôrenskadu **C2**
J6 Soebatsfontein **B3**
J7 Spektakel Pass **B3**
J8 Spoegrivier **B3**
J9 St Helena Bay **C4**
K1 Umdaus **B2**
K2 Vanrhyns Pass **C4**
K3 Wallekraal **B3**
K4 Wildeperdehoek Pass **B3**
K5 Witputs **B1**
K6 Witsand **C2**
K7 Wuppertal **C4**

Hills & Mountains

K8 Augrabiesberg (Oograbies) **B2**
K9 Aurusberg **B1**
L1 Blesberg **B2**
L2 Boegoeberge **C4**
L3 Bokkeveldberge **C3**
L4 Carolusberg **B2**
L5 Cedarberg **C4, C4**
L6 Farquharson se Kop **B2**
L7 Great Helskloof **B2**
L8 Harrasberg **A1**
L9 Heiob **A1**
M1 Khamiesberg **B3, C3**
M2 Klinghardt Mountains **A1**
M3 Kobeeberge **C4**
M4 Kourkam **B3**
M5 Langeberge **D4, D5**
M6 Little Helskloof **B2**
M7 Matsikamma (Gifberg) **C4**
M8 Meulsteenberg **C3**
M9 Namiesberge **C2**
N1 Namusberge **B1**
N2 Nutabooi **B1**
N3 Quaggaskop **C3**
N4 Rooiberg (SA) **B2**
N5 Rooiberg (Namibia) **B1**
N6 Rosyntjieberg **B2**
N7 Sandberg **B2**
N8 Skimmelberg **B2**
N9 Stinkfonteinberge **B2**
O1 Swartberge **D5**
O2 Tatasberg **B2**
O3 Udabibberge **B1**
O4 Wildeperderant **B2**
O5 Witteberge **D5**


1
2
3
4
5
6
7
A
B
C
D
E
F
G
H
I
Cunene
Baynes Mountains
Hartmann Mountains
Hoarusib
Opuwo
Oshakati
Ondangwa
Okavango
CAPRIVI STRIP
Zambezi
Omuramba Ovambo
Etosha Pan
Namutoni
Sesfontein
Hoanib
Okaukuejo
Tsumeb
Grootfontein
Otavi
Outjo
Otjiwarongo
Huab
Ugab
Brandberg
Omaruru
Erongo
Cape Cross
Usakos
Okahandja
Khomas Hochland
Henties Bay
Windhoek
Swakopmund
Walvis Bay
Kuiseb
Namib Desert
Rehoboth
Kalkrand
Sossusvlei
Maltehöhe
Mariental
Aub
Nossob
Molopo
Helmeringhausen
Lüderitz
Aus
Seeheim
Keetmanshoop
Great Karas Mountains
Sperrgebiet
Fish
Karasburg
Grünau
Rosh Pinah
Oranjemund
Alexander Bay
Vioolsif
Warmbad
Richtersveld
Goodhouse
Pella
Augrabies Falls
Kakamas
Upington
Lutzputz
Port Nolloth
Steinkopf
Pofadder
Orange (Gariep)
Prieska
Springbok
Kleinzee
Namaqualand
Gamoep
Kamieskroon
Bushmanland
Brandvlei
Vanwyksvlei
Hondeklipbaai
Garies
ATLANTIC OCEAN
Bitterfontein
Loeriesfontein
Nieuwoudtville
Williston
Nuwerus
Calvinia
Vanrynsdorp
Vredendal
Olifants
Fraserburg
Clanwilliam
Swartland
Citrusdal
Sutherland
Velddrif
Piketberg
Saldanha
Berg
Tulbagh
Ceres
Langsburg
Prince Albert
Touws River
Calitzdorp
Worcester
Paarl
Montagu
Ladismith
Robertson
Breede
Robertson Karoo
Little Karoo
Riversdale
Swellendam
Caledon
Heidelberg
Albertinia
Mossel Bay
Hermanus
Overberg
Bredasdorp
Cape Town
Plettenberg Bay
George
Knysna
Uniondale
Oudtshoorn
Willowmore
Steytlerville
Jansenville
Somerset East
Aberdeen
Graaff-Reinet
Beaufort West
Great Karoo
Carnarvon
De Aar
Victoria West
Loxton
Middelburg
Colesburg
Vosburg
Britstown
Cradock
Adelaide
Fort Beaufort
Grahamstown
Uitenhage
Port Elizabeth
Port Alfred
East London
Great Kei
Kingwilliamstown
Elliot
Aliwal North
Phillipolis
Orange
Vaal
Sand
Riet
Douglas
Kimberley
Ladybrand
Bloemfontein
Maseru
Kroonstad
Potchefstroom
Klerksdorp
Vereeniging
Johannesburg
Rustenburg
Pretoria
Zeerust
Kanye
Gaborone
Molepolele
Thabazimbi
Lephalale
Limpopo
Kalahari
Tsodilo Hills
Okavango Delta
Maun
Nata
Makgadikgadi Salt Pans
Francistown
Ghanzi
INDIAN OCEAN



GAZETTEER

A Western Cape Province
B Eastern Cape Province
C KwaZulu-Natal
D Free State Province
E Northern Cape
F North West Province
G Gauteng
H Limpopo Province
I Mpumalanga
J Swaziland
K Mozambique
L Zimbabwe
M Botswana
N Namibia
O Lesotho

Aberdeen 5H
Albertinia 5H
Adelaide 6H
Alexander Bay 3F
Aliwal North 7G
Augrabies Falls 4F
Auob 4F
Aus 2E
Baynes Mountains 1B
Beira 10C
Beit Bridge 8D
Beaufort West 5H
Birchenough Bridge 9C
Botletle 6C
Brandberg 2C
Brandvlei 4G
Bredasdorp 4I
Bitterfontein 3G
Bloemfontein 6F
Britstown 5G
Bulawayo 7C
Caledon 4H
Calitzdorp 5H
Calvinia 4G
Cape Cross 2C
Cape Town 3H
Carnarvon 5G
Ceres 4H
Chimoio 9B
Citrusdal 4H
Clanwilliam 4H
Colesburg 6G
Cradock 6H
Crocodile 8D
Cunene 1A
De Aar 5G
Douglas 5F
Durban 8G
East London 7H
Elliot 7G
Empangeni 8F
Ermelo 8E
Erongo 2C
Eshowe 8F
Etosha Pan 2B
Fish River 3F
Francistown 7C
Gaborone 6D
Gamoep 3G
Gamtoos 6H
Garies 3G
George 5H
Ghanzi 5C
Goodhouse 3F
Graaff Reinet 6H
Grahamstown 6H
Great Karas Mountains 3F
Great Fish 7H
Grootfontein 3B
Grünau 3F
Gweru 8B
Harare 8B
Hartmannberge 1B
Helmeringhausen 3E
Heidelberg 4H
Henties Bay 2C
Hermanus 4I
Hoanib 1B
Hoarusib 1B
Huab 1C
Isiteki 9E
Jansenville 6H
Johannesburg 7E
Kakamas 4F
Kalkrand 3D
Kamieskroon 3G
Kanye 6E
Karasburg 3F
Keetmanshoop 3E
Kimberley 6F
Kingwilliamstown 7H
Kleinzee 3G
Klerksdorp 7E
Knysna 5H
Kuiseb 2D
Laaiplek 3H
Ladismith 4H
Ladysmith 8F
Ladybrand 7F
Laingsburg 4H
Lephalale 7D
Loeriesfontein 4G
Louis Trichardt 8D
Loxton 5G
Lüderitz 2E
Lutzputz 4L
Makgadikgadi 6C
Maltehöhe 3E
Maputo 9E
Mariental 3D
Maseru 7F
Mashishing 8E
Masvingo 8C
Maun 5C
Mbabane 8E
Mbombela 8E
Middelburg 8E
Middelburg 6G
Mokopane 7D
Molepolele 6D
Molopo 5E
Montagu 4H
Mookgophong 7E
Mossel Bay 5H
Mthatha 7G
Musina 8D
Mutare 9B
Namutoni 3B
Nata 6C
Nieuwoudtville 4G
Nossob 4E
Nuwerus 3G
Ohrigstad 8E
Okaukuejo 2B
Okavango Delta 5B
Omaruru 2C
Omaruru River 2C
Omuramba Ovambo 3B
Ondangua 2B
Oograbies Mountains 3F
Opuwo 1B
Oranjemund 3F
Oshakati 2B
Otavi 3B
Otjiwarongo 3C
Okahandja 3C
Oudtshoorn 5H
Pella 4F
Pietermaritzburg 8F
Piet Retief 8F
Penge 8D
Phalaborwa 8D
Phillipolis 6G
Piketberg 4H
Pofadder 4F
Polokwane 8D
Port Alfred 6H
Port Elizabeth 6H
Port Nolloth 3F
Port Shepstone 8G
Potchefstroom 7E
Pretoria 7E
Outjo 2C
Paarl 4H
Plettenberg Bay 5H
Prieska 5G
Prince Albert 5H
Rehoboth 3D
Riversdale 4H
Robertson 4H
Rosh Pinah 3F
Rustenburg 7E
Saldanha 3H
Save 9C
Seeheim 3E
Sesfontein 1B
Somerset East 6H
Sossusvlei 2E
Springbok 3G
Standerton 7F
Steinkopf 3F
Steytlerville 6H
Sundays 6H
Sutherland 4H
Swakopmund 2D
Swellendam 4H
Thabazimbi 7E
Tsodila Hills 5C
Tsumeb 3B
Tzaneen 8D
Tugela 8F
Tulbagh 4H
Ugab 1C
Uitenhage 6H
Uniondale 5H
Upington 4F
Usakos 2C
Vanwyksvlei 5G
Vereeniging 7E
Victoria West 5G
Vioolsdrif 3F
Vosburg 5G
Vredendal 3G
Windhoek 3D
Walvis Bay 2D
Warmbad 3F
Willeston 4G
Willowmore 5H
Vanrynsdorp 4G
Worcester 4H
Zeerust 6E

Map drawn by Robin Frandsen

ASPHODELACEAE Juss.

ALOE **L.** (See page xxxi)

Aloes are a dominant species in places in the region with many thousands of plants dotting the landscapes. Some species are also very rare in nature. In size they range from very small plants, such as *Aloe saundersiae*, to giant trees such as *A. marlothii*. They occur in very varied habitats and are found throughout Africa, Madagascar, and Arabia. The medicinally–famous *A. vera* is recorded as far afield as India and the Americas, but has probably been introduced into those areas. A total of more than 500 species is recorded.

ALOE ACULEATA **Pole-Evans** *Aloe aculeata* is usually a stemless aloe, although sometimes with a procumbent, but never erect, short simple stem, with densely lanceolate leaves with marginal and surface pungent spines. The plants are usually solitary and are never in dense groups. Their height is up to 0.8 m. It usually produces only one 2–4 branched inflorescence with a densely multi-flowered raceme of yellowish to orange flowers; the yellow flowers are sometimes bi-coloured with orange tips.

Distribution: Widespread and common in N Limpopo Province from Mokopane (Potgietersrust) northwards into much of Zimbabwe.

ALOE AFFINIS **Berger** This is a solitary acaulescent species not found in groups. It forms rosulate, erect to sub-erect clusters of broad leaves usually with twisted dried apices. The surface is immaculate, but clearly lineate with many longitudinal dark lines. The margins are armed with pungent reddish-brown teeth. The base of the plant is covered with persistent dried leaves. The inflorescence is up to 1 m with 5–10 branches. The racemes are densely-flowered up to 25 cm long, cylindrical not conical with a rounded apex, dull brick-red to scarlet.

Distribution: Occurs in the mountainous areas of Mpumalanga and E Limpopo Province, from W Swaziland, northwards to the Strydom Tunnel in the N Drakensberg.

ALOE AFRICANA **Mill.** This is a tall, stemmed aloe, up to about 4 m tall. Tall plants have been encountered in dense bush. They are usually solitary and the stems are covered to the base with persistent dried leaves. It favours bush and shrub country. The leaves are densely rosulate, spreading and recurved, dull green, somewhat glaucous. The inflorescence is up to 80 cm tall; 2–4 branched with the racemes cylindric-acuminate. The buds are dull red and the open flowers are yellow-orange.

Distribution: Confined to the E Cape where it occurs from Humansdorp in the E to E of Grahamstown. It is locally common.

ALOE ALBIDA **(Stapf) Reynolds** This is a very small grass aloe which grows singly or in small groups. The small rosette of spirally-arranged leaves tends to grow horizontally out of the ground. The leaves are green, narrowly lineate, immaculate with small white marginal teeth. The inflorescence is simple with two-lipped lobes to the white flowers which have greenish tips.

Distribution: Occurs only in the Barberton area and narrowly into Swaziland, in the mist region, high-up in the mountains.

ALOE ALOOIDES **(Bolus) Druten** *Aloe alooides* is a spectacular single-stemmed aloe which was formerly and validly named *A. recurvifolia*, which seems to be a more appropriate name as *alooides* means 'resembles an aloe', but it *is* an aloe! The plant grows up to 2 m tall with the stem covered with marcescent leaves and the long, recurved, spreading, sometimes downward-pointing leaves which may reach the ground or with the apices touching the stem.





Aloe alooides plant & flower in habitat near Graskop in Mpumalanga
Photo Gerhard Beukes



Tim Peatling



Tim Peatling



Darrel Plowes



Philip Nel

Tim Peatling

1 - 3. ***Aloe aculeata*** (1) In habitat at the Save River, (2) 10 km E of the Birchenough Bridge, SE Zimbabwe (3) The inflorescence showing the bi-coloured effect.
4. ***Aloe africana*** in habitat 50 km north of Grahamstown
5. ***Aloe affinis*** Plant and inflorescence in habitat near Machadodorp, Mpumalanga
6 & 7. ***Aloe albida*** in habitat near Barberton, Mpumalanga



Philip Nel. Inset Gerhard Beukes



Philip Nel





The green, sometimes reddish, leaves are lanceolate-ensiform. The margins are distinctly red with brownish-tipped pungent teeth. The inflorescence is always simple, in excess of 1 m tall with densely multi-flowered racemes which are narrowly cylindric. The buds are greenish and when opened the yellow exserted stamens give a bi-coloured green-yellow effect.

Distribution: This species has a very limited range, but which is fairly densely populated, near Graskop/Sabie in Mpumalanga

ALOE ANGELICA **Pole-Evans** This species is up to about 4 m tall, single stemmed or sometimes branching. The rosette comprises narrowly ensiforme immaculate leaves which gradually taper towards the apex. The younger spreading and the older much recurved. The brownish edges are armed with pungent brownish teeth. The inflorescence is much-branched and rebranched low down with a densely capitate panicle of orange-red to red flowers which are greenish-yellow to yellow when open, giving a distinct 2-toned effect.

Distribution: Confined to the Soutpansberg Mountains, N of Louis Trichardt. It favours dense bush, where its height raises it well above the surrounding vegetation.

ALOE ARBORESCENS **Mill.** This iconic and variable species is one of the best known of our aloes. It is a common garden and public areas plant and its brilliant display of flowers is a delight in Spring. The plant is up to 3 m tall, many branched and arborescent. Its rosettes are up to 80 cm in diameter and the leaves are erect to erect-spreading, dull- to grey-green with the margins armed with firm, not pungent teeth. The inflorescence is usually simple, about 80 cm in length with a conical to elongate-conical raceme, 2–4 to a rosette. The colour is usually bright orange-red, with yellow flowers not unknown.

Distribution: Very widespread from near Cape Town between the S and E Cape mountains and the sea, northward through the E parts of KZN Natal, Swaziland, between Mashishing (Lydenburg) and the sea, along the Soutpansberg, northwards to E Zimbabwe and Mozambique and further N.

ALOE ARENICOLA **Reynolds** This beautiful species is difficult in cultivation. It is solitary or sparingly branched with the stems decumbent in the open and sub-erect when supported by other plants, with the apical third somewhat ascending. The leaves are densely rosulate and sheathed at the base with the edges corneous with teeth. The leaves are bluish-green with large prominent oval white spots. The inflorescence is up to 50 cm long, usually simple but with up to 2 branches. The raceme is densely capitate with the flowers pale orange, yellowish to greenish towards the tips.

Distribution: This species has a limited distribution, but is locally plentiful. It is a coastal species and is reported from south of Hondeklip Bay to near the Orange River mouth.

ALOE ASPERIFOLIA **Berger** This arid-land species is similar to *A. claviflora.* It is acaulescent, or rarely with short sideways-creeping stems, which grow radiating outwards with the inflorescences pointing sideways. The plants form up to 30 rosettes. The leaves are almost white, with the surfaces roughly granulated with minute asperities and rough to the touch. The inflorescences are 2–3 branched up to 75 cm long and are produced sideways with uni-coloured scarlet flowers.



Aloe arenicola
in habitat near Kleinzee, north western Cape
Photo Gerhard Beukes



Philip Nel



Priscilla Burgoyne SANBI

1. ***Aloe angelica*** The tall tree aloe in habitat at Wylliespoort, Soutpansberg
2 - 4. ***Aloe arborescens*** (2) in habitat, God's Window, Mpumalanga
(3 & 4) In cultivation near Winterton, KwaZulu-Natal
5 & 6. ***Aloe asperifolia*** inflorescence and plant in habitat near Uis, southern Namibia



Robin Frandsen



Gerhard Beukes





Robin Frandsen

Distribution: This is a desert plant from the Namib occurring in Namibia from Uis in the south, northwards to N of Cape Cross in a band up to 60 km from the coast.

Aloe ballii **Reynolds** *Aloe balii* is a small cremnophile usually found hanging down sheer rock faces and is popular in hanging baskets. The pendulous spiral stems can develop up to and longer than 1 m. The leaves are soft and pale green with faint oblong white or pale green spots scattered on the lower parts. The long inflorescence, up to 60 cm long, is simple and produced obliquely or horizontally with the raceme facing downwards or occasionally upturned. The flowers are scarlet to darker red.

Distribution: This species is confined to a very small area in the N Chimanimani Mountains in E Zimbabwe.

Aloe barbertoniae **Pole-Evans** This is an acaulescent, usually solitary, maculate species with persistent old dry leaves which may form a very short stem. It forms dense rosettes of slightly canaliculate leaves with twisted dry apices. The leaves are covered on the upper surface with many elongated whitish spots which are more or less confluent, forming undulating and interrupted bands. The lower surface is unspotted. The margins are armed with pungent deltoid teeth. The inflorescence is tall, up to 1 m with up to 8 branches. The flowers are dull reddish-pink.

Distribution: In the Lowveld around Mbombela (Nelspruit), and to Kaapmuiden. Also near Polokwane (Pietersburg) and with an outlier distribution near Weenen in KwaZulu-Natal where reddish to orange flowered plants are found.

Aloe bergeriana **(Engler) A. Berger** (prev. *Chortolirion bergeriana)* Although this species was described in 1908, it had since been placed in synonymy with *Aloe welwitchii*. Detailed study has shown this to have been incorrect and, based on many compelling factors, it has been reinstated. This much larger and robust species is single, with ciliated, greyish-green broader leaves which are immaculate on both surfaces and are up to 29 cm in length. These are less spiraled than the other two species. The autumn-flowering simple inflorescence is up to 40 cm long. The horizontally disposed flowers are pink-whitish and these are larger than the other species and appear with the leaves.

Distribution: This is a rare species, occurring on rocky outcrops in Gauteng, Mpumalanga and Namibia.

Aloe bowiea **Roem. & Schult.f.** These very small plants are easily overlooked in habitat. They almost always form dense mats of many offshoots. The roots are fusiforme and the leaf-bodies are broad and concave at the base, narrowing abruptly into an almost linear erect form, giving the effect of the base being bulbous. The green leaves have minute white spots towards the base with the wide outside base somewhat striate. The margins have minute, white teeth. The inflorescence is simple, with brownish, inconspicuous stalked flowers arranged spirally off the peduncle. They were previously known as *Bowiea africana.*

Distribution: This endangered species is confined to a small area around Port Elizabeth and Kariega, near the coast.

Aloe boylei **Masson** This grass aloe is solitary or forms small groups and grows up to about 60 cm tall. The older plants off-shoot from the base to form groups of up to about 12. The leaves are broad, up to 9 cm long, and flat or channelled, lanceolate to ensiform, deep green with a few oblong white spots on the lower portion. The margins are soft and white with soft white teeth. The inflorescence is simple, with 1—3 produced from the rosette. The raceme is capitate with salmon-pink, greenish-tipped flowers.

Distribution: This somewhat widespread species is found in the grasslands from the region of Mthatha in the former Transkei, northwards through KwaZulu-Natal, into

Aloe bowiea in habitat in the S Cape *Photo Ernst van Jaarsveld*





Darrel Plowes





Org Fritz



Darrel Plowes

Darrel Plowes



Darrel Plowes



1. ***Aloe ballii*** in habitat in the Haroni Gorge, near Melsetter, Zimbabwe
2. ***Aloe bergeriana*** The plant in habitat. Inset: the inflorescence
3. ***Aloe barbertoniae*** in habitat in Thornveld, east of Estcourt, KwaZulu-Natal
4 & 5.***Aloe boylei*** Left: in habitat near Howick, KwaZulu-Natal *Photo Darrel Plowes.*
Above. in habitat in Mpumalanga
Photo Judd Kirkel Welwitch

Swaziland and E Mpumalanga to near Mashishing (Lydenburg) in the N.

Aloe branddraaiensis **Groenew.** A beautiful species which is much sought after as a garden subject. It is an acaulescent plant which sometimes offsets from the base. This plant is rosulate with lanceolate-attenuate leaves which die back at the tips. The surface is flattish to slightly concave; the colour is green becoming somewhat reddish towards the tips with numerous H-shaped whitish, irregularly-scattered dots. The inflorescence is a much-branched panicle with many secondary and tertiary branches growing up to 1.5 m tall, the racemes are capitate to corymbose with the flowers being dull scarlet-red.

Distribution: Recorded from Ohrigstad-Branddraai, about 40 km N of Mashishing (Lydenburg) to Penge in the Olifants River Valley in Mpumalanga.

Aloe brevifolia **Mill.** *Aloe brevifolia* is a dwarf and popular acaulescent species which divides into largish groups of densely compact rosettes up to about 9 cm in diameter. The immaculate leaves are lanceolate, flat to slightly concave and glaucous-green. The margins are armed with pungent white deltoid teeth. The leaf-tip is armed with a sharp white tooth. The inflorescence is simple with 1—2 produced from a rosette, about 40 cm tall. The raceme is conical and the flowers are pale scarlet. Two other varieties are recognised: var. *depressa* and var. *postgenita.* The variety *depressa* varies from the nominate variety in being considerably larger, with rosettes up to 30 cm in diameter and with some spots (not always present) on the upper and lower parts of the leaves. The variety *postgenita* varies in being intermediate in size between the other 2 varieties. It should perhaps be subsumed under var. *brevifolia*.

Distribution: A popular species which occurs from about Bredasdorp to Riversdale in the SW Cape. The variety *depressa* occurs near Caledon. The variety *postgenita* occurs E of the Breede River between Ashton and Swellendam.

Aloe broomii **Schönland** This is a short-stemmed aloe sometimes dividing into 2–3 rosettes. The leaves are densely rosulate, up to 1 m in diameter. The tips of the stems die back. The inflorescence is usually simple, up to 2 to a rosette. The racemes are very densely multi-flowered, cylindric and very long. The flowers open successively from the base to the tips. The unique feature is that the flowers are completely hidden in the bracts with the only evidence that the flower is open is the long exserted brightly brownish-orange coloured genitalia. There is one variety: *tarkaensis*. Its distinguishing features are the more robust, up to 1.3 m in diameter, rosettes, the much shorter, dry bracts with the flowers exposed. The flowering time also differs.

Distribution: The nominate species occurs just N of the Orange River, southwards to Molteno, westwards to Carnarvon and in the E to Dordrecht. The limited distribution of the variety *tarkaensis* is in the region of Graaff-Reinet, Tarkastad and Cradock in the E Cape.

Aloe buhrii **Lavranos** This is a rare stemless aloe which ultimately divides to form large groups. The glaucous leaves are broad, spreading, to erect and are green to purplish-green and marked with small distinctly 'H'–shaped white markings. The margins vary from smooth to very minutely toothed. The inflorescence is 1–few with as many as 15 capitate racemes of yellow to orange flowers.

Distribution: This species has a very limited distribution in the dry region above the Roggeveld Mountains W SW of Loeriesfontein across to near Calvinia.





Aloe buhrii in habitat at the type locality WSW of Loeriesfontein on top of the Roggeveld escarpment
Left: The inflorescence of a plant near Calvinia *Photo left:* Gerhard Beukes
Photo below: Robin Frandsen



Org Fritz



Org Fritz



Robin Frandsen



Ernst van Jaarsveld

1 & 2. ***Aloe branddraaiensis*** in habitat at Branddraai, near Ohrigstad, Mpumalanga
3. ***Aloe brevifolia* var. *brevifolia*** in habitat W of Caledon, SW Cape
4 & 5. ***A. brevifolia* var. *depressa*** in habitat SW of Worcester.
6. ***A. brevifolia* var. *postgenita*** in habitat SE of Ashton in the Robertson Karoo
7. ***Aloe broomii*** in habitat W of Colesberg, N. Cape
8. ***A. broomii* var. *tarkaensis*** in habitat near Graaff-Reinet, Great Karoo



Ernst van Jaarsveld

Ernst van Jaarsveld



Philip Nel



Priscilla Burgoyne SANBI



Aloe burgersfortensis **Reynolds** This species is usually a single rosette up to about 65 cm in diameter but sometimes divides to form a small group, or suckering to form larger groups. The leaves are acuminate with the upper brownish-green surface densely marked with oblong scattered white spots. The under-surface is pale grey-green and immaculate with linear markings. The margins are armed with pungent brownish teeth. The inflorescence is up to about 1.3 m tall; usually much branched above the middle, with a long terete loose panicle of dull-reddish flowers with a bloom coating, sometimes shaded orange towards the tips.

Distribution: Prolific in the Lydenburg Valley and towards Burgersfort/Steelpoort. Also occurs near to Louws Creek, near Barberton.

Aloe cameronii **Hemsley** This is an extremely variable and attractive species, especially when in winter the leaves turn bronze. It is a plant of shrubby growth, growing to more than 1 m in height usually forming smallish rosettes with short stems which are covered with persistent dead leaves. Plants seen in Malawi are sometimes more robust, with longer stems and larger rosettes. Leaves are convex to rounded on the underside and mainly slightly canaliculate on the inner surface, green, unspotted and turning bronze in winter. The margins have pungent pale-brown teeth. The inflorescence is produced usually 3 together, with 2–3 branches. Racemes are cylindric and densely flowered, deep scarlet in colour. Yellow flowers have been reported.



Distribution: *A. cameronii* occurs in W Zimbabwe, into W Mozambique from the Manica-Sofala region and from Malawi in the Zomba-Blantyre regions.

Aloe carnea **S. Carter** *Aloe carnea* is similar to *A. greatheadii* and replaces that species in its range. Indeed it seems that the separation of the two species may not be justified. A description of this species could well be a description of the other. The plant is perhaps smaller with a taller inflorescence. It is simple or in small groups and is acaulescent. The leaves are heavily marked with transverse, confluent or separate oblong spots or H–shaped markings and are dark green to reddish in colour—depending on their situation—heavily armed with pungent brownish deltoid teeth along the leaf-margins. The inflorescence is a branched panicle, up to 1.75 m tall. The racemes are capitate-corymbose, are fleshy-pink (hence their name – *flesh-coloured*) with white longitudinal stripes—which is in common with *A. greatheadii*.

Distribution: This species is recorded from much of the length of E Zimbabwe and the adjacent W Mozambique.

Aloe castanea **Schönland** *Aloe castanea* is a large tall species up to 4 m tall with branches near the stem which may be as thick as 30 cm, branching near the base and sometimes rebranching. The rosettes are dense and the leaves are glaucous with thin brown margins armed with small teeth. The inflorescence is always simple with up to 5 to a rosette and as long as 2 m in length, most of which is the densely multiflowered raceme. The flowers are copiously supplied with dark red nectar. The name 'the chestnut aloe' is derived from the dark reddish-brown flowers.



Aloe castanea Far left: in habitat near Mashishing (Lydenburg) Mpumalanga *Photo Philip Nel.*
Left: in habitat near Ohrigstad
Photo Gerhard Beukes



Tim Peatling

1. ***Aloe burgersfortensis*** in habitat at the Forever Resort, Blyde River, Mpumalanga Inset The inflorescence
2 & 3. ***Aloe cameronii*** (2)in habitat Chiduku.near Rusape
(3 in habitat at Kyle Dam, Masvingo.
4. ***A. cameronii* var. *bondana*** in habitat near Bonda, Eastern Highlands, Manicaland and detail of flowers
5. ***Aloe carnea*** in habitat at the Mannika Communal Centre, near Mutare, Zimbabwe. Inset: close-up of the flowers



Darrel Plowes



Tim Peatling



Darrel Plowes







Tim Peatling



Distribution: Common from N of eMalahleni (Witbank) across to Mashishing (Lydenburg) and N and NW towards Polokwane (Pietersburg).

ALOE CHABAUDII **Schönland** This is an acaulescent or very shortly caulescent species up to about 85 cm in diameter. It forms dense large groups from divisions or prolific basal offshoots. The rosettes comprise of dull grey-green to glaucous flat to sub-canaliculate leaves which are armed with small teeth. The inflorescence is much branched and re-branched with a loose raceme of pale brick-red flowers which are paler at the tips.

Distribution: A widespread species, which favours the base of granite hills, has its main concentration in central Zimbabwe and extends northwards into Malawi, westwards into W Mozambique and southwards through the Soutpansberg to Mookgophong (Naboomspruit) across to Mpumalanga, near Kaapmuiden and south eastwards into Swaziland.

ALOE CHALLISII **van Jaarsveld & A.E. van Wyk** This small species suckers freely, forming dense patches. The canaliculate leaves are glaucous, flaccid and sparingly spotted with oblong whitish dots on both sides, more concentrated towards the base. The margins are armed with small teeth. The inflorescence is decumbent to erect and the panicle is capitate to sub-conical. The flowers are red with greenish tips.

Distribution: On south east-facing cliffs on the Steenkampsberge, W of Mashishing (Lydenburg) in Mpumalanga.

ALOE CHLORANTHA **Lavranos** *Aloe chlorantha* is a recently discovered species is similar in growth form to *A. broomii*, but differs in the clustered growth-form and its smaller flowers. The young plants are single but the older plants divide to form up to 4, rarely up to 10 rosettes. The bright green lanceolate leaves, which can become reddish in unfavourable weather conditions, are armed only on the margins with pungent brownish teeth. The simple inflorescence, of which up to 3 to a rosette, may be produced, grows up to about 40 cm. The panicle is terete and pale green and small greenish-yellow flowers, striped with darker green are produced laterally.

Distribution: Occurs on rocky hillsides in a small area around Fraserburg in the N Cape.

ALOE CHORTOLIRIOIDES **Berger** *Aloe chortolirioides* is a small species which produces multiple branches of up to 50 stems. The leaves are rigid, erect, narrowly linear and multifarious, dull-green and unspotted. The inflorescence is robust, simple, producing one per stem in a season. The raceme is up to 25 cm tall, with the colour of the flowers scarlet with yellow to greenish tips. The many stems all flowering at once make this a very showy species. Flowering depends upon the plant being subject to veld fires. In cultivation the plant rarely, if ever, flowers but may be induced to do so if the plant is piled with dry grass, burnt and then watered in season.

Distribution: Fairly widely distributed. Most common along the mountain ridges around Barberton in Mpumalanga, northwards along the Drakensberg Range into Limpopo Province and southwards into W Swaziland.

ALOE CHRISTIANII **Reynolds** *Aloe christianii* may well be confused with its close relative, *A. pretoriensis*. It has a simple stem which is up to 1.5 m tall, erect or decumbent and covered with the dry dead previous growth. The rosette comprises grey green immaculate leaves which are armed with sharp marginal teeth. The inflorescence is very tall, up to 3 m, with a loose cylindric-acuminate raceme. The flowers are red.

Distribution: This species occurs across N Zimbabwe, N to the Congo and S Tanzania and into W Mozambique.





Robin Frandsen



Tim Peatling





SANBI



Philip Nel



Darrel Plowes



Darrel Plowes

1 & 2. ***Aloe chabaudii*** (1) from south of Mutare.
(2) At the walls of the Zimbabwe Ruins in south east Zimbabwe
3. ***Aloe challisii*** the plant in cultivation in Johannesburg
4 & 5. ***Aloe chlorantha*** (4) in habitat plus inset close-up of the inflorescence. (5) *Photo courtesy SANBI*

6. ***Aloe christianii*** in habitat 50km SW Mutare, Zimbabwe
7 - 9. ***Aloe chortolirioides*** in habitat after a veld fire in Mpumalanga.

Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch



***Aloe claviflora* Burch.** This relative of *A. falcata* is commonly called the *kraal* aloe. The word '*kraal*' means corral and the plants grow outwards from the centre, opening up in the form of a corral (*kraal*) or loop. The rosettes tend to lean over away from the centre and the older leaves die off with the stems, which are eventually exposed by the loss of the dead leaves, lying flat on the ground. It is an inhabitant of well drained rocky flats or rocky slopes in the more arid parts of South Africa. Another colloquial name is *cannon aloe*, derived from the almost invariably single (though rarely up to 4) inflorescence being produced sideways, away from the centre of the group. Flowers are pink with green lateral nerves. The yellow stamens are very prominent.

Distribution: *A. claviflora* is widely distributed in the Great Karoo, from the W parts of the E Cape, southwards along the N parts of the mountains of the S Great Karoo, westwards to W of Kakamas, and into the SE parts of Namibia as far W as Warmbad in Namibia.

***Aloe comosa* Marloth & A. Berger** This stately and unmistakable aloe dominates the landscape where it is found in its limited distribution. It can reach up to 5 m in height, with the tall spiky inflorescence, sometimes up to 3 m in length, adding further to the height. The plant is single stemmed and the leaves of the rosette are gracefully recurved. The old dead leaves are persistent, clothing the stem to the base of the plant. The inflorescence rarely branches and the flowers are usually pinkish but are sometimes yellow. It is a superb addition to a garden but must be watered sparingly in summer.

Distribution: *A. comosa* is confined to a small area N of Clanwilliam, which is in the winter rainfall region. The species sometimes forms quite extensive stands.

***Aloe comptonii* Reynolds** This species is usually acaulescent but does have stems up to 1 m. It forms dense groups of erect, compact rosettes. The leaves are glaucous green and immaculate. The outside keel is armed with a few sharp thorns and the margins are armed with similar pungent teeth. The inflorescence is branched with up to 8 panicles and is densely flowered. The flowers are unicoloured dull scarlet and their racemes are corymbose to rounded.

Distribution: This beautiful species is especially abundant near Willowmore and Uniondale. It occurs across the S Cape from Uniondale in the E across to W of Laingsburg and the hilly regions of the Little Karoo.

***Aloe cooperi* Baker** This grass aloe is solitary or forms small groups. The leaves are distichous and sometimes spirally twisted, up to 70 cm tall; green, with the upper surface usually unspotted, occasionally with a few white spots towards the base. The lower surface is heavily spotted low down and characteristically keeled. The edges are narrowly cartilaginous with sharp white teeth. The inflorescence is simple, up to 1 m tall, with up to 3 per rosette. The raceme is broadly conical with the flowers salmon-pink with greenish tips.

Distribution: Widely distributed in S KwaZulu-Natal, narrowly through central N KwaZulu-Natal, W Swaziland and into Mpumalanga.

Judd Kirkel Welwitch





Gerhard Beukes



Robin Frandsen



Tim Peatling



Judd Kirkel Welwitch



Darrel Plowes

Judd Kirkel Welwitch



Philip Nel



1 - 3. ***Aloe claviflora*** (1) in habitat on the farm Schuitdrift near Pofadder
(2) In habitat between Beaufort West and Merweville in the Great Karoo
(3) Detail of the flower, from near Upington
4 & 5. ***Aloe cooperi*** (1) in habitat near the Tugela Bridge, KwaZulu-Natal (2) In habitat in Mpumalanga
6 & 7. ***Aloe comptonii*** in habitat on the Anysberg in the Little Karoo
8. ***Aloe comosa*** in habitat near Clanwilliam, W Cape. Note the yellow-flowered form

Aloe cryptopoda **Baker** This common aloe is acaulescent or very occasionally with a very short decumbent stem. The rosette comprises sub-erect lanceolate dull to somewhat glossy green leaves with the margins armed with short pungent deltoid teeth. The tall inflorescence can reach as high as nearly 2 m and has up to 8 branches. The flowers are bright red to scarlet. The plants N of South Africa are smaller and less robust.

Distribution: The distribution is wide, from S Mpumalanga, S Limpopo Province and N into much of Zimbabwe, narrowly into Botswana and much of Mozambique and extending further N.

Aloe dabenorisana **Van Jaarsveld** This exceptionally rare aloe was discovered by the notable A.R. Mitchell in his travels while documenting the genus *Conophytum*. The plant is a cremnophile, occurring on steep quartzite cliffs and often forms multi-headed rosettes up to about a metre in diameter. The leaves are dull-green with a reddish tinge. The margins are armed with small sharp thorns. The inflorescence comprises 2–4 branches and the peduncles curve upwards. The racemes are conical and the flowers red to yellowish.

Aloe dabenorisana in habitat at the farm Dabenoris, near Pella, Pofadder
Photo *Gerhard Beukes*



Distribution: Occurs in a very limited range on the steep cliffs of quartzite hills: Dabenorisberg and Pellaberg, between Pella and Goodhouse

Aloe davyana **Schönl.** This species has been reduced to a subspecies of *A. greatheadii*. This is not upheld here. The plants are usually solitary but do ramify into 2–3 rosettes. The very fleshy leaves are spreading with about the apical half of the leaf twisted and dry. The flattish upper surface of the leaves is green with many oblong green spots, sometimes confluent, to form irregular bands. The leaf margins are armed with pungent teeth. The inflorescence is a branched panicle up to 1.2 m tall with a dense conical raceme of pink flowers with longitudinal green stripes and green tips.

Distribution: Widely distributed and very plentiful across the North West Province, Limpopo Province, Gauteng and Mpumalanga as well as the northern parts of the Free State Province.

Aloe decurva **Reynolds** This strange solitary and stemless aloe occasionally divides into two rosettes. It grows up to 1 m tall. The leaves are ensiform and recurve near the apices. They are immaculate and normally green with a reddish tinge. The margins are armed with pungent deltoid teeth. Up to three simple inflorescences are produced with downward-facing racemes of bright red to orange flowers.

Distribution: Of very limited distribution this species is presently only known from the top ridge of the Zembe Mountain, south of Chimoio in central Mozambique.

Aloe dewinteri **Giess** This cremnophile is a stemless, solitary species which occurs on steep cliff faces. The pale greyish-green leaves have brown horny margins with small somewhat sparse deltoid teeth. They are lanceolate, slightly recurved and flattish near the base and slightly keeled on the outside. The raceme is bi-coloured with the unopened buds pink and the opened flowers a pale whitish-cream.

Distribution: Occurs in the N Kaokoveld in the region of Sesfontein in N Namibia.



Darrel Plowes



Darrel Plowes



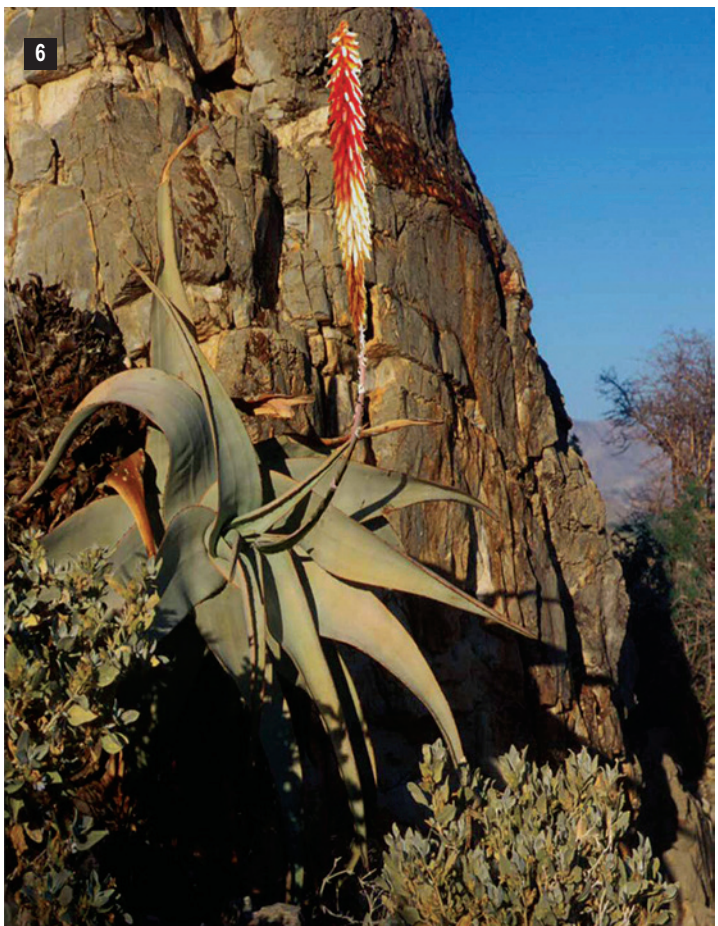
Gideon Smith SANBI

1 - 3. ***Aloe cryptopoda*** (1) in habitat near the Devuli River, Save Valley, E Zimbabwe
(2) Close-up of the inflorescence
(3) in habitat in the Limpopo Province
4. ***Aloe davyana*** in habitat on the Magaliesberg, Gauteng. Inset: flowers from the Magaliesberg,
5. ***Aloe decurva*** in habitat S of Chimoio, W Mozambique
6. ***Aloe dewinterii*** in habitat, hanging down on vertical cliffs near Sesfontein, N. Namibia



Judd Kirkel Welwitch

Philip Nel





Tim Peatling

Darrel Plowes



Aloe distans **Haworth** This is an endangered coastal species, threatened by urban development. It is a sprawling species, up to about 4 m in length, which roots along its length and offshoots frequently to form dense groups. The rosettes comprise erectly spreading lanceolate glaucous-green, somewhat canaliculate, leaves with a few slightly raised white spots on both surfaces. The edges are armed with sharp yellowish teeth, the obtuse keel has a few spines towards the apex. The inflorescence is 2—4-branched and up to about 60 cm in length, curving upwards. The panicle is a densely capitate raceme, which is dull-scarlet.

Distribution: Occurs narrowly along the coastal belt from N near Velddrif, southwards to near Cape Town, among coastal vegetation and rocks on sand.

Aloe dolomitica **Groenew.** This attractive species has been made synonymous with *A. vryheidensis* but the transfer is not upheld in this work. This species occurs only on dolomite. It is solitary with the stem clothed with the old marcescent leaves. It grows to the height of about 2 m with the leaves sub-erect to spreading. The leaves are densely rosulate, dark-green with a reddish margin armed with pungent brownish-red deltoid teeth. The simple inflor-escence is up to 6 per rosette, the raceme is cylindric and densely multiflowered, like *A. sesseliflora* and *A. vryheidensis,* and the buds are greenish-yellow opening to greenish-yellow to yellow with the orange exserted filaments prominent. Like the related species the flowers facing the sun (north) open earliest.

Distribution: N Drakensberg in N Mpumalanga across to near Mokopane (Potgietersrust) and along the Wolkberg near to Polokwane (Pietersburg) in the Limpopo Province.

Aloe dominella **Reynolds** This attractive grass aloe forms branched tufts of many stems. The leaves are narrow and the tips tend to die off. The upper surface is unspotted and the lower surface has numerous white spots near the base. The margins are narrowly cartilaginous with firm white teeth. The inflorescence is solitary and unbranched with a capitate raceme of yellow flowers.

Distribution: Occurs in N and central KwaZulu-Natal from Estcourt northwards to Vryheid and westwards very narrowly into the NE Free State.

Aloe dumoulinii **Marloth** This species has been placed in synonymy with *A. krapohliana*, where it probably does belong. However it is so distinct in appearance and habit that this work prefers to retain it. This small plant grows in an extremely arid region, but which benefits from fog from the sea. The rosettes are usually solitary but large clumps of up to about 15 heads do occur. The leaves are erect, firm and green, red when drought-stressed, with marginal teeth. The inflorescence is a capitate raceme of scarlet flowers. As mentioned above this species is more correctly classed as *A. krapholiana*. However I believe it is sufficiently distinct to be classed as a separate species. It is however a controversial decision.

Distribution: Limited to a small area E of Alexander Bay in the Richtersveld.

Aloe ecklonis **Salm-Dyck** This grass aloe is solitary or develops small groups. The rosette comprises broad flattish green leaves which are generally unspotted but may have a few spots near the base of the lower surface. The margins are narrowly cartilaginous with many short pungent teeth. The inflorescence is solitary and unbranched with a capitate raceme of yellow or pink flowers. It has been established that the three species described as *A. boylei, A. kraussii* and *A. hlangapies* may be conspecific with *A. ecklonis.*

Distribution: Widely distributed from near Magoebaskloof in Limpopo Province, the grasslands of the Mpumalanga Highveld, NW and W Swaziland, through the E Free State Province, NE Lesotho and narrowly along the E KwaZulu-Natal escarpment and southwards into the inland E Cape as far south as Kingwilliamstown.

Philip Nel





Robin Frandsen



Robin Frandsen



A A Kloppers



Robin Frandsen

1 & 2. ***Aloe dumoulinii*** (1) in habitat on the side of a hillock at Kortdoring, E of Alexander Bay. (2) on the crest of the hillock in accociation with *Conophytum* cf. *hians, Crassula plegmatoides, Othonna clavifolia* and many other succulents
3 & 4. ***Aloe distans*** (3) in habitat, (4) in habitat on the coast of Yzerfontein, N of Cape Town
5. ***Aloe dolomitica*** in habitat at Wolkberg, near Haenertsburg
6. ***Aloe dominella*** in habitat near Estcourt, KwaZulu-Natal
7 - 9. ***Aloe ecklonis*** (7) in habitat in vast numbers, in SE Mpumalanga. Inset: close up of the inflorescence
(8) In habitat nr Badplaas, Mpumalanga (originally described as *A. hlangapies*)
(9) close-up of the inflorescence



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Philip Nel



Judd Kirkel Welwitch

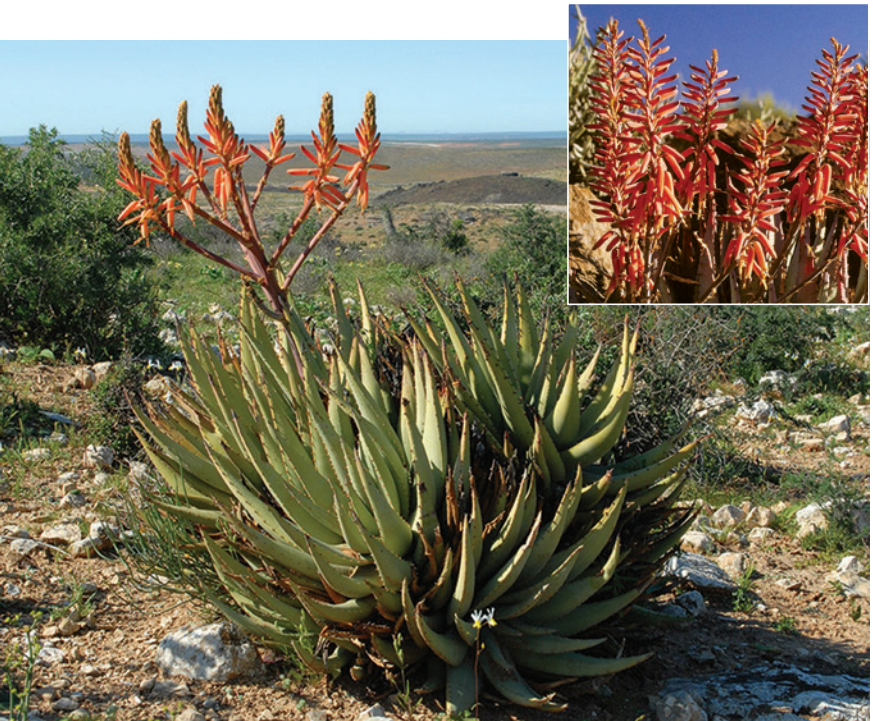


Aloe erinacea **D.S. Hardy** This species is closely allied to *A. melanacantha*. It is probably best allocated as a subspecies of that plant. The vegetative differences are however consistent and it must remain as a separate taxon. The plant forms compact groups, occasionally solitary , but often a fairly large group as can be seen in the accompanying illustration. The grey-green leaves are incurved and densely rosulate. They are heavily armed with pungent black thorns along the keel of the outer surface, with a few randomly situated on the inner face and along the margin. The inflorescence is simple usually one from a rosette. The racemes are cylindric, and densely clothed with dependent buds and open flowers, which are crimson with grey tips.

Distribution: This is an inhabitant of the dry desert region E of Lüderitz, near Witputs in Namibia.

Aloe excelsa **A. Berger** This is a single-stemmed aloe growing up to 4 m in height. The stems are clothed for most of their upper length with persistent dead leaves. The rosette consists of canaliculate dull to reddish green leaves with reddish-brown pungent prickles and a scattering of prickles only on the lower surfaces. The inflorescence ramifies into up to 15 erect racemes. The flowers heads are cylindric, not unlike *A. rupestris*; their colour is red or reddish-orange, very occasionally yellow.

Distribution: *A. excelsa* is widespread in Zimbabwe and narrowly into W Mozambique. Also occurs in the extreme N E corner of South Africa.



Aloe falcata **Baker** This species is closely allied to *A. claviflora*. Like that species it adds rosettes in an outward tendency. It does not, however, open out in the centre and form the ring (or *kraal*) like *A. claviflora*. The outside rosettes tend to lean outwards. Stems are short or absent. The inflorescences are multi-branched, up to 10 racemes and flowers are red, occasionally yellow and slightly greenish tipped. This spectacular species does not thrive outside its natural flat and sandy habitat.

Distribution: *A. falcata* occurs from near Klawer in the south, to NE of Loeriesfontein to the Richtersveld in the north. It does not occur along the coastal strip.

Aloe ferox **Mill.** This stately aloe, up to about 2 m, is an outstanding feature of the landscape where it is sometimes very common. Recent taxonomic activity has regrettably reduced the beautiful Natal race, previously known as *A. candelabrum*, into synonymy with this species. Over its very wide distribution there is much variation but the species can be recognised by its salient features: the leaves are dull green turning reddish when drought-stressed; dark-brown pungent spines line the leaf edges and the stems are clothed with persistent dead leaves. The inflorescence has five to eight racemes with erect tall floral panicles. Flowers are scarlet, sometimes orange-yellow. Even white-flowered specimens occur. Open flowers have long exserted red stamens, strongly contrasting, especially with the lighter-coloured flowers. It is common in cultivation.

Distribution: *A. ferox* occurs from Swellendam in the Western Cape Province in a broad swath encompassing most of the Eastern Cape Province, excepting the NW, and into S KwaZulu Natal. Some populations occur in south east Lesotho.

Aloe fosteri **Pillans** This spectacular maculate aloe is usually stemless with bluish-green leaves with a powdery bloom. The leaves are lanceolate-ligulate and the tips die back and the upper surface is heavily marked with somewhat confluent 'H'-markings which form irregularly transverse bars. The solitary inflorescence branches irregularly from near the base with up to 15 branches

Aloe falcata in habitat on the farm Aties, 15 km S of Vanrynsdorp *Photo Tim Peatling*
Inset: flowers from Annisfontein, Richtersveld *Photo Gerhard Beukes*



Gerhard Beukes



Darrel Plowes



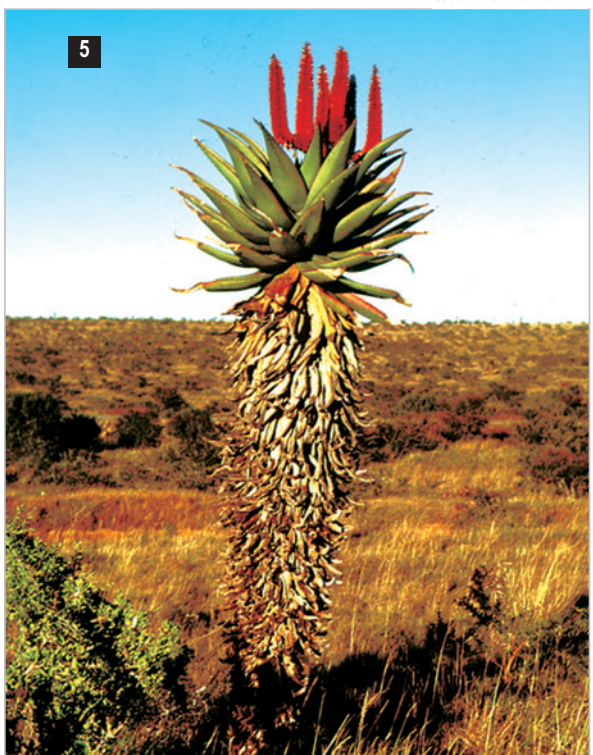
David Frandsen

1. ***Aloe erinacea*** in habitat on the Farm Zebrafontein near Witputs, Namibia
2 & 3. ***Aloe excelsa*** 8 m tall plants from near the Changadzi River-Sabi Valley, Zimbabwe.
Inset: details of the inflorescence from a plant from the Cumberland Valley, E Zimbabwe
4 & 5. ***Aloe ferox*** (*A. candelabrum*)
(4) A young plant in habitat,
(5) In habitat near Bedford, E Cape
6 & 7. ***Aloe fosteri*** Two different colour forms from Ohrigstad, Mpumalanga

Tim Peatling



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch



topped by longish conical racemes of brightly-coloured red orange or yellow flowers, often bi-coloured.

Distribution: *A. fosteri* is native to the region N of Mashishing (Lydenburg) in Mpumalanga, N & NW to Polokwane (Pietersburg) in Limpopo Province

ALOE FOURIEI **D.S. Hardy & Glen** This grass aloe has stems up to 15 cm. The plant forms small groups or is solitary. The green leaves are long and slender, quite heavily spotted at the base of the leaves on the underside with a few spots on the upperside. The inflorescence is simple with a capitate raceme with the flowers deep red with greenish-yellow tips.

Distribution: This rare species occurs between Mashishing (Lydenburg) and Pilgrims Rest in Mpumalanga.

ALOE FRAMESII **L. Bolus** This coastal species forms large dense groups of up to 20 rosettes. The decumbent slender stems are short to long. The leaves are attenuate-lanceolate and incurved, light to dark green with innumerable spots usually present on both surfaces. The margins have sharp deltoid brownish teeth. The erect inflorescence is simple or 1–3 branched near the base with a conical raceme of red flowers, these become paler when opening.

Distribution: The species favours coastal sand and occurs from Saldanha Bay northwards to N of Port Nolloth.

ALOE GARIEPENSIS **Pillans** This species is usually solitary but it does branch to form small groups. The plant is usually stemless but larger specimens up to 1 m can have short stems. Leaves are incurved spreading becoming sub-erect and are green to brick-red and conspicuously longitudinally striated. The margins are armed with small pungent reddish teeth. The inflores-cence is simple but in the very robust forms can be up to 3 branched and up to 1.2 m tall. The racemes are charac-teristically long and narrow and yellow to greenish-yellow and sometimes with red buds which become yellow on opening.

Distribution: Occurs on both sides of the Orange River from Keimoes in the E to near Sendelingsdrif in the Richtersveld National Park in the west. it occurs up to points N of the Fish River Canyon in S Namibia.

ALOE GERSTNERI **Reynolds** This is an acaulescent or shortly caulescent, rarely branching, species which is densely rosulate with lanceolate, erect leaves which are smooth on both surfaces but armed with widely-spaced pungent thorns along the margins. Their colour is dull grey-green. The inflorescence is simple in young plants with 1—3 branches on mature plants. The raceme is densely multiflowered, cylindric and the reddish-orange flowers are cylindric, slightly clavate, turning brownish at the apices.

Distribution: Occurs in a restricted area around Nongoma-Vryheid to Babanango in KwaZulu-Natal.

ALOE GLAUCA **Mill.** This is a stemless or very short-stemmed species. The rosettes are up to 80 cm in diameter. The leaves are flattish, spreading to sub-erect, very glaucous and blue-green in colour. The surface is unspotted but with longitudinal striae. The margins are armed with reddish-brown pungent teeth. The inflorescence is simple with 1 or more to a rosette. The raceme is cylindric, acuminate with densely congested buds which are obscured by their covering bracts. The flowers are red, grading to yellow with greenish tips.

Distribution: On rocky places and mountainous areas of the W Cape. It is discontinuous in its distribution: from Steinkopf in the N to Clanwilliam, near Piketberg, near Laingsberg and S of Swellendam.



Aloe glauca
in habitat
Photo Philip Nel



Philip Nel



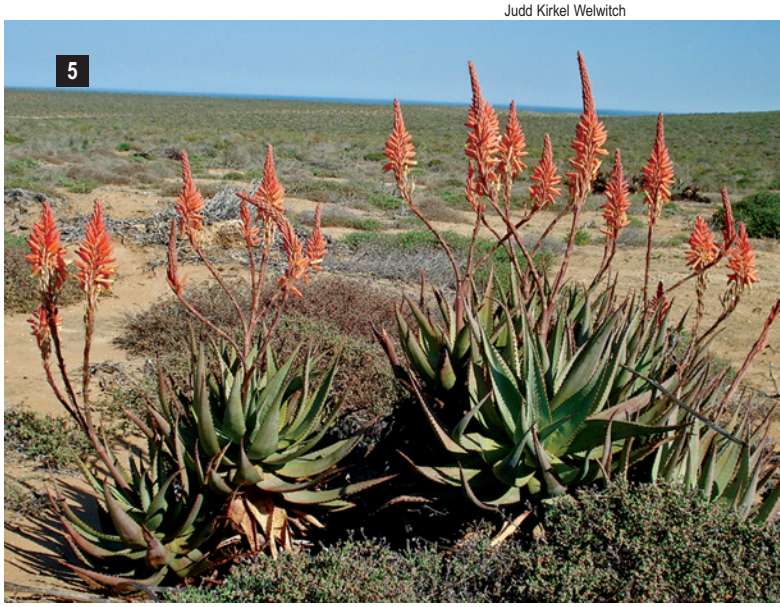
Ernst van Jaarsveld

1 & 2. ***Aloe gerstneri*** in habitat
3 & 4. ***Aloe fouriei*** (3) in habitat at Tubex, Wolkberg, Limpopo Province
(4) In habitat at the Blyde River, Mpumalanga
5 ***Aloe framesii*** In habitat N of Port Nolloth
6 & 7 ***Aloe gariepensis*** in habitat NE of Sendlingsdrift, overlooking the Richtersveld National Park, across the Orange River
8 & 9. ***Aloe glauca*** in habitat near Steinkopf, Namaqualand, NW Cape

Priscilla burgoyne SANBI



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Robin Frandsen



Robin Frandsen



Aloe globuligemma **Pole-Evans** This is a stemless to stemmed species with a creeping habit with suckers and off-shoots which forms dense colonies. The rosette is spreading at the base, then erect and with the tips recurved. The leaves are glaucous, bluish-green to purplish. The edges are armed with non-pungent small teeth. The tall inflorescence, up to 1 m, is horizontally branched above the upper half of the peduncle. The raceme consists of erect, obliquely-disposed flowers all pointing backwards. Their colour is red, grading to pale yellow. The exserted stamens of the opened flowers are blackish with prominent yellow pollen.

Distribution: This is a common species with dense colonies in the W Limpopo Province from the Olifants River in the south and then northwards, avoiding the Soutpansberg Mountains, into S Zimbabwe on the Save River to south of Mutare. It is also reported as occurring in the region of Francistown in Botswana.

Aloe graciliflora **Groenew.** This species was previously transferred to *A. greatheadii* but has recently been reinstated. It is acaulescent or with a short stem. The upper surfaces of the leaves are bright shiny green, with innumerable oblong, white spots, sometimes coalescing to arrange into irregular wavy transverse bands. The lower surface is pale, whitish green, unmarked to copiously marked with spots. The leaf margins have pungent deltoid brownish teeth. The inflorescence produces 3—5 branches from below the middle. The panicle is cylindric-acuminate with deep pink to dull orange-red flowers.

Distribution: Occurs between Barberton and Dullstroom in Mpumalanga.

Aloe grandidentata **Salm-Dyck** This species is acaulescent or with a very short stem. It suckers to form dense groups. The leaves are rosulate, lanceolate, flat at the base and slightly canaliculate towards the tips. The upper face is densely marked with transverse broken bands of dull-white oblong, usually confluent markings. The tips of the leaves usually die back and are persistent. The margins have a brown cartilaginous border and are strongly armed with brown pungent spines. The inflorescence is tall, up to about 95 cm, branching on their upper half. The racemes are usually cylindric, sometimes acuminate. The flowers are dull-reddish, sometimes pale salmon.

Distribution: This is a widespread species occurring from SE Botswana, southwards into the SW Free State, eastwards to near Bloemhof in the North West Province and westward to E of Groblershoop on the Orange River.

Aloe greatheadii **Schönl.** As discussed under that species, *A. greatheadii* is likely to be conspecific with *A. carnea.* It has also included *A. davyana,* a transfer which has not been upheld here. It is simple or forms small groups; is acaulescent. The leaves are heavily marked with transverse, confluent or separate oblong spots, or 'H'–shaped markings and are dark green to reddish in colour—depending on their situation—heavily armed with pungent, brownish deltoid teeth along the leaf-margins. The inflorescence is a branched panicle, up to 1.75 m tall. The racemes are capitate-corymbose and are fleshy-pink to reddish with white longitudinal stripes—which is in common with *A. carnea.*

Distribution: This is a very widespread species. It occurs in the Limpopo Province with the main distribution in Zimbabwe where it is abundant throughout most of the country. It occurs in NE Botswana, from about Francis-town and extends as far N as the Katanga province in the Democratic Republic of the Congo.

Aloe hazeliana **Reynolds** This is a small slender species producing a few stems from ground level. The leaves are sub-erect to spreading and distichous, up to 20 cm long, flat to slightly canaliculate on the upper surface, unspotted or with a few elliptical pale-green spots. The under-surface is


8



Philip Nel



Tim Peatling



Gideon Smith SANBI

1 & 2. ***Aloe globuligemma*** (1) in habitat (2) in habitat at Nyanyadzi, in the Save Valley, E Zimbabwe
3. ***Aloe graciliflora*** in habitat in Mpumalanga
4 & 5. ***Aloe grandidentata*** (9) in habitat NE of Vryburg, N Cape In habitat near Steynsburg N Cape
6 & 7. ***Aloe greatheadii*** in habitat at on the Mutare/Nyanga Road, 50 km N of Mutare with the raceme of flowers inset
8. ***Aloe hazeliana*** in habitat in the Chimanimani Mountains near Melsetter in E Zimbabwe



Tim Peatling



Priscilla Burgoyne SANBI



Tim Peatling



rounded with crowded pale green elliptical spots. The margins have a narrow hyline edge with firm deltoid white teeth. The inflorescence is simple and is produced laterally. The raceme is lax with the flowers pendant, the buds green-tipped and the opened flowers scarlet with green tips.

Distribution: On the Chimanimani Mountains about 28 km SE of Melsetter in Zimbabwe.

ALOE HERERoensis **Engl.** This aloe usually occurs as a single rosette, although it does occasionally form up to three heads. The newer leaves tend to curve inwards, exposing their undersides. The upper surfaces of the leaves are unspotted, but are with indistinct darker veins and the undersides, especially in the younger plants, have 'H'–shaped markings. The leaf-edges are armed with reddish to brown pungent, sometimes twinned, thorns. *A. hereroensis* favours flat sandy or rocky ground and is also found on rocky slopes. The inflorescences are multi-branched and the floral panicles are wider than long. Flowers are red. Yellow-flowered plants, described as var. *lutea* are found only in Namibia.

Distribution: *A. hereroensis* is a very widespread species occurring from the SW corner of the Free State Province to Upington, and in a swath northwards through central Namibia into Angola.

Aloe howmannii in habitat in the Chimanimani Mountains, near Melsetter, Zimbabwe
Photo Darrel Plowes



ALOE HOWMANNII **Reynolds** This rare species could be described as a cremnophile, favouring steep rockfaces where its somewhat linear leaves are pendant with the inflorescence curving upwards and holding the raceme erect. The leaves are distichous and linear; green in colour with a hyaline, entire border or with minute teeth. The inflorescence is simple with the raceme cylindric to sub-capitate. The flowers are red with greenish to yellow tips. This attractive species is almost impossible to keep alive in cultivation.

Distribution: On the south shaded slopes of the highest point, known as Binga, from the Musapa Gap to the Bundi Gorge on the Chimanimani Mountains in E Zimbabwe.

ALOE HUMILIS **(L.) Mills** This is a charming, easy to cultivate, acaulescent plant which forms dense groups of rosettes of erect, slightly incurved lanceolate, strongly acuminate, unspotted, glaucous-green leaves, which are up to 12 cm tall. The upper surface is sparingly tuberculate with soft white prickles, with the under-surface more copiously so. The margins are armed with soft white teeth. The inflorescence is up to about 35 cm high, invariably simple with a loose panicle of cylindric reddish-pink with green tipped or yellow flowers.

Distribution. Occurs in the Little Karoo from S of Calitzdorp, southwards to the coast and NW and W towards Graaff-Reinet, Somerset East and Grahamstown.

ALOE IMMACULATA **Pillans** This as a solitary stemless species which sometimes forms a short stem. It is densely rosulate, erect and with leaves which are acuminate/lanceolate. Leaves are dull-green to brownish and, despite the plant's name, are commonly spotted. They are invariably tipped with a twisted, dried leaf-apex. Margins have a horny edge with deltoid pungent brown to reddish teeth. It is very difficult to separate this species from other maculates and it should perhaps be synonymous with *A. greatheadii*. The inflorescence is 6—10 branched, up to 1 m with a sub-capitate raceme of orange-pink, to coral to red flowers.



Robin Frandsen



Org Fritz

1. ***Aloe hereroensis***: in habitat at Strydenburg, N Cape
2 & 3. ***Aloe humilis*** (2) In habitat at Coega, E Cape (3) in cultivation in Johannesburg
4 & 5. ***Aloe immaculata*** in habitat

Niels Jacobsen



Robin Frandsen



Gideon Smith SANBI



Distribution: Occurs from Polokwane (Pietersburg) south-westerly towards the Olifants River and southwards to Mashishing (Lydenburg).

Aloe inconspicua **Plowes** The plants are acaulescent and well-named as they are difficult to locate in their grasslands habitat when they are not in flower. The leaves are rosulate, narrowly linear, tapering towards the tips. They possess elongate white markings towards the base of the leaves which are dark green. The leaves spread broadly and abruptly at the base so that the base of the plant takes on the appearance of a bulb. The plant reaches up to about 50 mm. The inflorescence is simple, about 150 mm tall. The raceme is triangular when in bud and cylindrical when fully developed. Flowers are sessile and are green with a semi-translucent whitish perianth lobe.

Distribution: In the Bushmans River valley SE and S of Estcourt in KwaZulu–Natal.

Aloe integra **Reynolds** This small grass aloe, which grows up to about 15 cm, is solitary or forms small groups. The leaves are sub-erect, slightly incurved, are green, obscurely lineate and immaculate with the tips usually dying back. The margins are narrowly cartilaginous and usually entire. The inflorescence in simple, up to 50 cm tall, with the racemes densely capitate to sub-conical. The flowers are yellow.

Distribution: Occurs in a narrow range from W Swaziland in a narrow band to about Carolina in Mpumalanga, northwards to about Pilgrims Rest.

Aloe jeppeae in habitat, showing the spiralled leaves. Right: Showing the inflorescence
Photo Org Fritz





Aloe inyangensis **Christian** This is a mountain-loving species, favouring the edges and cracks in the tops of bare rock faces, which has densely tufted stems up to 20 cm long. The leaves are up to 20 cm long, sparsely spotted on the upper surface and usually copiously spotted near the base of the lower surface. The margins are minutely toothed. The inflorescence is simple and up to 35 cm long. The flowers are bright scarlet red, and greenish towards the tips.

Distribution: Found in fairly large stands on the tops of the Inyanga Mountains in E Zimbabwe at Rokotso where it forms large clumps up to 2 m in diameter. It is abundant along the tops of the Inyanga Mountains. It is also found E of Troutbeck

Aloe jeppeae **Zonn. & Fritz** This species was formerly known as *Chortolirion angolensis, it* is nearest to *A. welwitchii* with its erect, dull-coloured flowers. It has broader, very contorted leaves and is often clump-forming. The leaves are greyish-green and armed along the margins with minute teeth and sharply pointed at the apex. The leaves are up to 5 mm broad and up to 12 cm tall. The inflorescence is up to about 40 cm tall and the flowers, which are produced in summer are reddish-brown.

Distribution: Occurs in sandy soil in central and S Free State and has recently been found in S Gauteng and near Zeerust, indicating a very wide distribution.

Aloe karasbergensis **Pillans** This species has been described as a subspecies of *A. striata,* a transfer which is not upheld here. The plant is acaulescent but may have a short stem. It may form groups of up to 20 heads. It is a large species with rosettes which may be in excess of 1 m in width. It is a beautiful species, the leaves of which are pale glaucous-green in colour with many longitudinal striations and with a narrow cartilaginous entire margin which may be slightly crenulate. In nature it becomes reddish-pink in the heat of the direct sun and loses its colour in winter. The inflorescence is 1–3 producing an untidy panicle of loosely-disposed flowers, which are pink in the lower half of the perianth and greyish with white and green alternating stripes.



Niels Jacobsen



Niels Jacobsen



Robin Frandsen



Sean Gildenhuys

1 & 2. ***Aloe inconspicua*** in habitat (1) showing the exposed subterranean bulbs of the species (2) the plant growing in habitat
3 & 4. ***Aloe integra*** flowering after rains at Badplaas, Mpumalanga
5. ***Aloe inyangensis* var. *inyangensis*** flowering on the Bideford Kopje, Inyanga, Zimbabwe, inset: close-up of the inflorescences
6 & 7. ***Aloe karasbergensis*** (6) in habitat on a slope of the hills E of Cornellskop, W Richtersveld after rare heavy rains, (7) The plant in the flowering season, showing the untidy habit of the inflorescence



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Darrel Plowes



Distribution: This species occurs widely from the W edge of the Richtersveld mountains, northwards to near Aus in Namibia, across to the Great Karasberg Mountains and south easterly to south of Prieska in the N Cape.

ALOE KHAMIESENSIS **Pillans** This species is closely related to *A. framesii.* It is a mountain-loving species which grows up to 3 m tall on a stout stem which occasionally branches above the middle to form a second rosette. The withered leaves are somewhat marcescent, with the lower part of the stems bare of the shed dead leaves. The leaves are sub-erect, pale dull-green with a few dull white spots, with the apical portion somewhat recurved. The inflorescence branches freely with a long conical, dense raceme. The flower-colour is orange-red and with a greenish tip.

Distribution: It is found only in the mountainous areas of the Northern Cape from N of Steinkopf, southwards along the Khamiesberg range and on the Bokkeveld escarpment to N of Nieuwoudtville.

ALOE KNIPHOFIOIDES **Baker** This solitary species is named after the Red Hot Poker (*Kniphophia* sp.). The unspotted leaves are erect, linear and about 30 cm long and are minutely toothed along the margins or entire. The stems arise from a small subterranean bulb-like swelling, a rare feature in the genus. The inflorescence is up to 55 cm, usually solitary and sometimes 2. The raceme is a loose cone with the long, narrow flowers scarlet with greenish tips.



Aloe kniphofioides in habitat near Amsterdam, Mpumalanga. Note the damage to the flowers due to sunbird activity
Photo Judd Kirkel Welwitch



Distribution: Occurs from the mountainous regions of Mpumalanga, through Swaziland into N KwaZulu-Natal and then occurring along the border with the E Cape and shortly into that province.

ALOE KOMAGGENSIS **Kritzinger & van Jaarsveld** The transfer of this species to *A. striata* is not upheld here. This usually stemless species produces dense groups, although old specimens may develop short stems. The leaves are lanceolate-deltoid, boat-shaped, light yellowish to grey-green with pinkish or reddish margins with darker longitudinal striations. The leaves are suffused with red when drought-stressed. The inflorescence is a large head of pinkish-red to bright orange flowers produced from short to long branches.

Distribution: Occurs on the W slopes of the Escarpment around Kommagas, W of Springbok in Namaqualand.

ALOE KOUEBOKKEVELDENSIS **van Jaarsveld & A.B. Low** This is a decumbent to erect species, usually solitary, but occasionally dividing into small groups. The plants are closely allied to *A. buhrii* but are distinguished by their larger grey-white, bluish tinged leaves, obscurely striate with H-shaped irregular markings, becoming reddish with drought-stress. The cartilaginous margins are armed with small pinkish-white teeth. The inflorescences are longish-branched corymbose panicles with capitate racemes of orange-red flowers. Branching is above the middle.

Distribution: Occurs in a small area in fynbos vegetation on the steep S slopes of the Kouebokkeveld Mountains, W of Citrusdal in the SW Cape.

ALOE KRAPOHLIANA **Marloth** This very distinctive small aloe has glaucous leaves which recurve, which are often transversely banded, with small whitish pungent teeth edging the leaves. The plants are usually simple but can develop into several heads. The plants are usually solitary, not developing into groups. The inflorescence is simple and large in proportion to the plant and the flowers are bright scarlet. The small and charming *A. dumoulinii* is regarded by some as conspecific. This is not accepted by many and I am satisfied that it is sufficiently distinct to retain its specific status. See *A. dumoulinii.*



Philip Nel





Photos: Judd Kirkel Welwitch





Gerhard Beukes

1. ***Aloe khamiesensis*** in habitat near Springbok
2. ***Aloe komaggensis*** in habitat near Kommagas, NW Cape.
3. ***Aloe kouebokkeveldensis*** the plant in habitat at the type locality, N Kouebokkeveld, W Cape
4 - 6. ***Aloe krapohliana*** (4 in habitat W of Port Nolloth. (5) In habitat near Wallekraal, Namaqualand. Note the attractive lateral banding on the leaves (6) the plant in seed. Inset: the inflorescence

Philip Nel



Philip Nel



Distribution: *A. krapohliana* is an inhabitant of the NW Cape, from W of Pofadder across to the Richtersveld. and southwards to the Van Rynsdorp district. It is plentiful near Bitterfontein. *A. dumoulinii* is found in the extreme NW of South Africa, near Alexander Bay. *A. krapohliana* may also occur across the Orange River, in Namibia.

ALOE LINEARIFOLIA **Berger** This grass aloe is a small solitary species and rarely with 1—2 branches at the base. It is up to about 25 cm tall, with fleshy fusiforme roots. The distichous, linear leaves are spreading to sub-erect, pale green with the upper surface unspotted and the underside spotted with white and brown spots near the base. The inflorescence is simple and capitate. The raceme consists of greenish-yellow to yellow flowers.

Distribution: Occurs in dispersed colonies in grasslands in S KwaZulu-Natal, also along the coast from N and S of the E Cape border.

ALOE LINEATA **(Aiton) Haw.** This robust-stemmed aloe has a bulky appearance in more mature specimens. The stems are covered for about 1/3 of their upper length with persistent dead leaves. The rosettes are compact and the leaves are bluish-green. Both surfaces have distinct reddish striations and the edges are armed with pungent reddish-brown teeth. The inflorescences are simple and the flowers range from light pink to scarlet. The species has one variety: var. *muirii*. This variety has larger marginal teeth, the leaves are yellow-green and more distinct reddish striations. The flowering-time is different from the var. *lineata*. Inhabits thicket or dense bush. Very easy and attractive in cultivation. Does not do well in severe frost.

Distribution: The variety *lineata* occurs from Riversdale to Grahamstown, westwards it is found south of the Outeniqua Mountains. The variety *muirii* inhabits the Little Karoo particularly in Renosterveld along the N slopes of the Outeniqua Mountains.



ALOE LITTORALIS **Baker** *A. littoralis* is a stemmed aloe which grows up to about 3 m. It is almost invariably single-stemmed, with double-stemmed plants believed to occur as a result of injury. The stems are covered with persistent dead leaves. The leaves are greyish-green to reddish and are armed with a few brown thorns on the upper side, the edges are armed with sharp brown thorns and the undersides are sparsely marked with laterally oblong spots. The one to two inflorescences are branched—up to five—with conical floral panicles. Flowers are pink to red, with distinct pale yellowish tips. Easily cultivated, even young plants will flower.

Distribution: *A. littoralis* occurs in N Namibia to as far south as Windhoek, N Botswana, S Zimbabwe and narrowly into W Mozambique. It occurs only in the N and SW parts of the Limpopo Province in South Africa.

ALOE LONGIBRACTEATA **Pole-Evans** This is a solitary species which is densely rosulate and up to 35 cm in diameter. It has thick triangular-lanceolate leaves which wither at the tips. They are dark-green sometimes with a reddish tinge with numerous dull-green to whitish oblong spots somewhat arranged in irregular transverse bars. The edges are armed with reddish to brownish sharp deltoid teeth disposed along a corneous margin. The inflorescence is usually about 80 cm tall, sometimes taller, usually solitary but sometimes 2, branching well below the middle with a narrow, long, cylindric raceme. The flowers are reddish, usually with a yellowish mouth.

Distribution: Widely distributed from near Polokwane (Pietersburg) in the NW, across to N of Mashishing





Gerhard Beukes



Gerhard Beukes

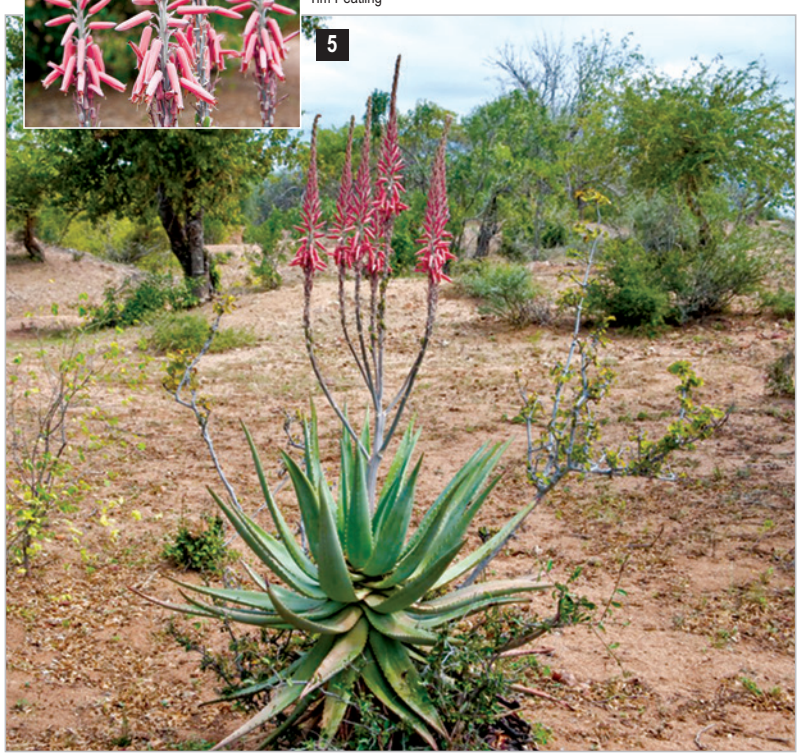


Judd Kirkel Welwitch



1 & 2. ***Aloe lineata* var. *lineata***
(1) in habitat near Grahamstown, E Cape
(2) Close-up of the inflorescence
3. ***A. lineata* var. *muirii*** in habitat in the S Little Karoo
4 *Aloe longibracteata* in habitat. Inset: close-up of the inflorescense. *Photo Philip Nel*
5. ***Aloe littoralis*** in habitat 15 km S of Nyandzi, Save Valley S.E. Zimbabwe
6. ***Aloe linearifolia*** in habitat,

Tim Peatling



Philip Nel



(Lydenburg), southwards towards Dullstroom and eastwards to the Crocodile River Valley.

Aloe longistyla **Baker** This distinctive stemless species cannot be confused with any other, either in or out of flower. It is usually solitary but does produce up to 3, and very occasionally more, rosettes. The leaves are sub-erect, densely crowded with many leaves which are glaucous-green with a waxy coating. They are spined on the margins, occasionally on all surfaces but then generally only towards the apex. The inflorescence consists of a large raceme in relation to the size of the rosette with disproportionately large seedpods. The short peduncles have the racemes appearing almost within the rosette. They are cone-shaped, with long, slightly recurved perianths which are pale salmon pink to red.

Distribution: It occurs widely from Calitzdorp in the W to near Grahamstown and northwards towards Graaff-Reinet.

Aloe lutescens **Groenew.** This species is usually stemless but, with age, may develop a short stem. It clusters freely forming dense stands. It is very similar to *A. cryptopoda*, but is distinguished by its freely-clustering habit. The semi-glossy yellowish leaves are densely rosulate, erect and slightly canaliculate towards the tips. They are armed with pinkish-brown pungent teeth along the margins. The inflorescence is 2—4 from a rosette (usually 3), branched from low down to the middle with vertical narrow-cylindric racemes of red buds, opening yellow.

Distribution: This occurs mainly between the Soutpansberg and the Limpopo River and in parts of the Waterberg in Limpopo Province

Aloe maculata **All.** This widespread species has been previously and incorrectly classified under *A. saponaria*. It is stemless or with a very short stem. The rosette is spreading to sub-erect with the leaves slightly recurved towards the dried twisted tips. The surfaces are marked with longitudinal oblong spots. The margins are armed with deltoid pungent teeth. The colour is bright green to reddish. The inflorescence is a dichotomously-branched panicle with the racemes densely capitate-corymbose. The flowers range from deep red through pink to yellow with whitish tips.

Distribution: This widespread species ranges from S Mpumalanga to N of Amsterdam, and a band through central KwaZulu-Natal, to coastal Eastern Cape, W and S Lesotho to near Stutterheim, then disjunctly N of Port Elizabeth and also locally approximately between Mossel Bay and Plettenberg Bay.

Aloe marlothii **A. Berger** This is probably the best-known tree aloe in the region. This invariably single-stemmed, widely-occurring aloe covers numbers of hills in parts of its distribution range in countless thousands. It is best known for its laterally spreading inflorescence, although recent attempted taxonomic changes, with the incorporation of *A. spectabilis*, with its almost erect inflorescences, into the species is calculated to bedevil identification. This transfer is not upheld in this work. It grows up to 4 m, sometimes even up to 6 m, in height and the stems are usually cloaked for much of their length with persistent

Photo AW Klopper SANBI







Kuba Jilemicky



Judd Kirkel Welwitch



AW Klopper SANBI



Darrel Plowes



Tim Peatling



Tim Peatling

Org Fritz





Judd Kirkel Welwitch

1 & 2. ***Aloe longistyla*** (1) in habitat near Willowmore.
(2) a seeded specimen in habitat
3. ***Aloe lutescens*** in habitat in Limpopo Province
4 - 6. ***Aloe maculata*** (4) in habitat. (5) red-flowered form
(6) yellow-flowered form
7 - 10. ***Aloe marlothii*** (7 -8) Plants with red flowers, note the abundant spines on both leaf surfaces, from 7 km N of Utrecht, KwaZulu-Natal (9) in habitat, with *Euphorbia ingens,* between Polokwane and Haenertzburg, Limpopo Province
(10) A plant with orange flowers from the Magaliesberg, W of Pretoria

dead leaves. The leaves are dull green to greyish-green with pungent reddish-brown marginal thorns. The upper surfaces are studded with few to many pungent brown teeth and the undersides are heavily studded with pungent teeth. The inflorescence consists of an erect peduncle with laterally-produced racemes of upwardly pointing flowers. Many colour forms exist from deep scarlet, through red to orange, yellow to pale yellow. The long exserted red stamens are striking on the more yellow-flowered forms. The species is easily cultivated and is common in gardens and parks.

Distribution: *A. marlothii* is widely spread from the extreme E parts of Botswana, across the N North West Province, all of Limpopo Province and into Mozambique. The range extends southwards into northern Kwa-Zulu Natal. Apparently it does occur narrowly into S Zimbabwe.

ALOE MELANACANTHA **A. Berger** This species forms large stands. The plant is decumbent, shortly caulescent and forms up to 10 neatly rounded rosettes. The green to red leaves are spreading and curve upwards with the margins and dorsal keel armed with large black pungent thorns. The inflorescence is simple, rarely with a branch, up to 1 m. The conical raceme is densely flowered with red flowers with the open flowers grading to pale yellow.

Distribution: An inhabitant of sandy and rocky places from narrowly into S Namibia across the Orange River N of the Richtersveld National Park, to S from Bitterfontein across to Nieuwoudtville.

ALOE MEYERI **Van Jaarsveld.** This recent discovery is another pendant cremnophile, being found hanging down the inaccessible sides of cliffs. The stems are up to 1 m in length and branch from the base or along the stem. The grey-green to reddish-green leaves form rosettes up to 70 cm in diameter and are armed by small marginal teeth. The inflorescence hangs down and curves upwards with the capitate raceme comprising of reddish-orange flowers with green tips.

Distribution: This species is as yet only recorded from the Rosyntjieberg Mountains in the Richtersveld National Park.

ALOE MICRACANTHA **Haw.** This small grass aloe, which grows to about 60 cm tall, is the only grass aloe to occur in the W Cape and in the fynbos biome. The leaves are rigid, canaliculate, green and spotted on both surfaces. The inflorescence is simple with a capitate raceme flowers which are salmon-pink and greenish towards the tips.

Distribution: Found on dry sandy ground from about Uniondale in the W to about Grahamstown.

ALOE MICROSTIGMA **Salm-Dyck** This widespread species usually occurs as a solitary plant but sometimes forms small groups. Its stem is short to up to 50 mm and is covered with persistent dried leaves. The leaves are densely rosulate, lanceolate-deltoid, usually obscurely lineate, green sometimes with a reddish tinge with sharp deltoid reddish teeth on the margins. The inflorescence is usually 2–3 produced simultaneously with long narrow conical racemes which are generally red, with the open flowers becoming yellowish. Colonies of all-yellow flowered specimens occur.

Distribution: From near Grahamstown in the E to Worcester-Robertson in the W and northwards to N of Sutherland. Also latterly recorded from near Aus in S Namibia and southwards.

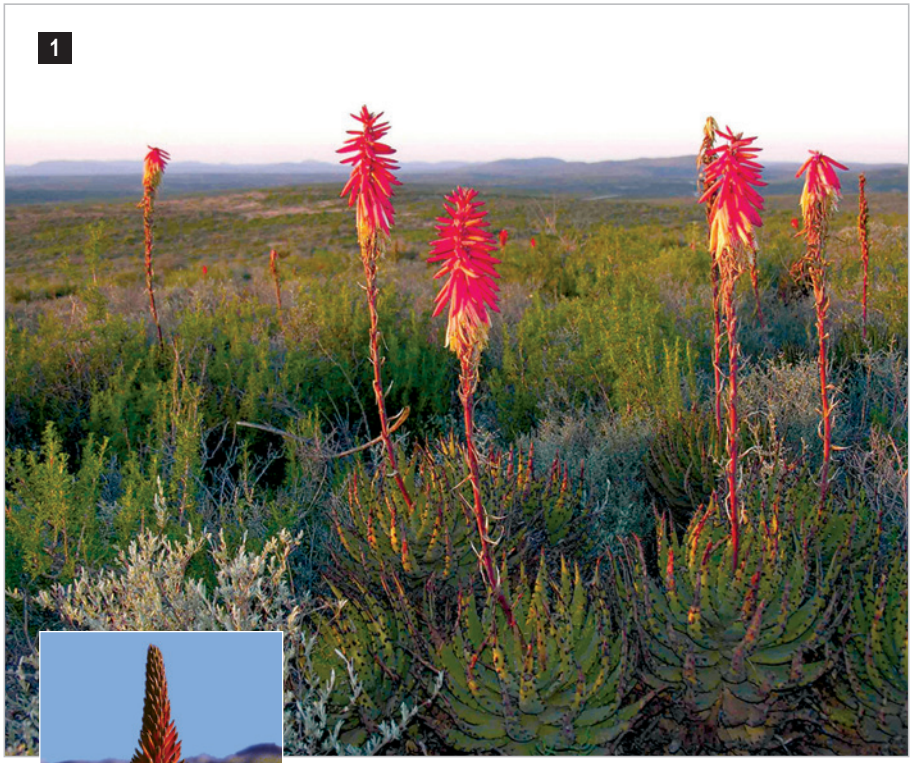
ALOE MINIMA **Baker** This is a solitary stemless grass aloe. The roots are spindle-shaped and the sub-erect leaves are



Philip Nel

Ernst van Jaarsveld





Philip Nel. Inset Gerhard Beukes





Philip Nel





7 & inset Philip Nel

1. ***Aloe melanacantha*** a plant from W of Steinkopf, Richtersveld, N Cape. Inset: a flower from near Springbok
2 & 3.***Aloe meyeri*** in habitat on the Rosyntjieberg, Richtersveld National Park, NW Cape
4. ***Aloe micracantha*** In habitat in the S Cape
5 & 6. ***Aloe microstigma*** (5) in habitat in the Gannagakloof, E Tanqua Karoo. (6) in habitat on the Rosyntjieberg, Richtersveld. Generally believed to occur only in the south, a form is found near Aus in Namibia. This illustration is of a plant from S of that locality. Distribution of this species is in need of revision.
7 & 8. ***Aloe minima*** (7) in habitat on the Steenkampsberge, Mpumalanga
(8) In habitat at Willowgrange, nr Estcourt, KwaZulu-Natal

David Frandsen



Gerhard Beukes



Darrel Plowes



linear and up to 30 cm long. The leaves are spotted on the basal half of the undersides of the leaves and the margins are minutely toothed on the lower half. The inflorescence is solitary and simple with a cone-shaped raceme. The flowers are lilac-coloured to yellowish.

Distribution: Recorded as widespread in the Blyderivier district of Mpumalanga, S Swaziland and S in a band to exclude coastal Zululand to near the coast south of Durban in KwaZulu-Natal.

ALOE MODESTA **Reynolds** This is a rare, small, somewhat inconspicuous species. Apart from a few scented species in Madagascar it is the only other known scented aloe. The plant is cryptic, grass-like and easily overlooked. The plant is stemless with the leaves rosulate, ascending and up to 20 cm long linear, but tapering at the upper half to a point. The leaves are unmarked with the margins very narrowly cartilaginous with small teeth. The inflorescence is simple, up to 30 cm tall. The raceme is subcapitate, slightly conical. The flowers are pale strongly-scented, yellow-green, with conspicuous orange stamens when open.

Distribution: Only 2 known localities: near Dullstroom and near Wakkerstroom in Mpumalanga.

ALOE MUDENENSIS **Reynolds** This is a solitary short-stemmed species which does sometimes form small groups. The leaves are densely rosulate, green to olive-green in colour with oblong white markings, occasionally unmarked, on the upper surface. The leaf-ends are inclined to die back. The edges are armed with pungent teeth. The inflorescence is a branched panicle up to 1 m tall with a sub-capitate raceme of red through pale orange flowers.

Distribution: Large numbers are found in the Muden Valley, N to Keate's Drift and E to near Greytown and in the nearby Tugela Valley in KwaZulu-Natal.

ALOE MUNCHII **Christian** This is a tall species, up to 3 m and rarely up to 5 m tall. It is usually simple-stemmed, but which occasionally branches sparingly. The immaculate leaves are dull grey-green with a reddish tinge and the margins are corneous with pungent small teeth. The inflorescence is 3–4 branched and the flowers are scarlet to orange with the unopened grey-green buds.

Distribution: Occurs on the Chimanimani Mountains both in Zimbabwe and neighbouring Mozambique.

ALOE MUSAPANA **Reynolds** This species is closely allied to *A. inyangensis*. it is mostly pendant with numerous shoots forming large groups. The leaves are falcately decurved with a few whitish spots low down. The leaf-margins are minutely toothed near their bases. The inflorescence is simple, up to 40 cm long. The flowers are scarlet to orange and greenish towards the mouths.

Distribution: Confined to the Musapa Mountains N of Melsetter in Zimbabwe and southwards towards the Chimanimani Mountains.

ALOE MUTABILIS **Pillans** This species is similar to *A. arborescens* but has notable characteristics which

Judd Kirkel Welwitch



Darrel Plowes



Philip Nel





Tim Peatling



Philip Nel

Darrel Plowes



1 & 2. ***Aloe mudenensis*** in habitat near Muden, KwaZulu-Natal
3. ***Aloe munchii*** in habitat near Melsetter, in the Chimanimani Mountains, where it is endemic
4. ***Aloe modesta*** Inflorescence of this attractive small grass aloe in habitat near Dullstroom, Mpumalanga
5 & 6. ***Aloe musapana*** (5) in habitat near Cashel, S of Mutare, E Zimbabwe. (6) Close-up of the inflorescence.
7 & 8. ***Aloe mutabilis*** in habitat W Johannesburg



Judd Kirkel Welwitch

Philip Nel





separate it from that species. This is a large, short-stemmed species which is never erect in habit and branches sparingly from the base. It favours rocky slopes and cliffs with the sub-erect rosette up to 1.2 m in diameter. The leaves are bluish-green and the tips are often shrivelled on the mature leaves. The inflorescence is usually unbranched but may have up to 2 branches. The attractive conical raceme is bi-coloured with red unopened buds becoming yellow when opening.

Distribution: Occurs from Johannesburg in the S to near Polokwane (Pietersburg) in Limpopo Province in the NW towards Rustenburg along the Magaliesberg Mountains.

Aloe myriacantha **(Haw.) Schult. & Schult.f.** This grass aloe is very widespread and disjunct. It is stemless and is invariably solitary. The leaves are long, channelled and narrow with a few spots towards the bases and small white teeth. The inflorescence is solitary with a capitate raceme. The double-lobed flowers are pinkish in South Africa and somewhat purplish elsewhere.

Distribution: In South Africa it is confined to the E Cape inland from East London to Port Elizabeth; in KZN Natal it occurs near Richards Bay. In Zimbabwe it is found in the E of the Country and probably in the immediately adjacent Mozambique; it extends northwards as far as Rwanda in East Africa.

Aloe namibensis **Giess** This beautiful species is stemless or decumbent up to about 1 m, rooting along its length. The rosettes are about 70 cm in diameter and the leaves are pale-green with a rough feel and armed along the margins with hard deltoid spines. The inflorescence is up to about 1 m tall, 3—6 branched with the racemes upright. The flowers are pinkish-red.

Distribution: Occurs N of Windhoek across to near Karibib in Namibia.

Aloe nubigena **Groenew.** This charming little aloe forms dense groups and favours rocky slopes, where the plant usually hangs down with the flowers curving upwards. The distichous leaves are long and narrow, green and the margins are with minute teeth, they are spotted towards the base. The inflorescence is simple, up to about 30 cm long with a capitate raceme of reddish flowers with green tips.

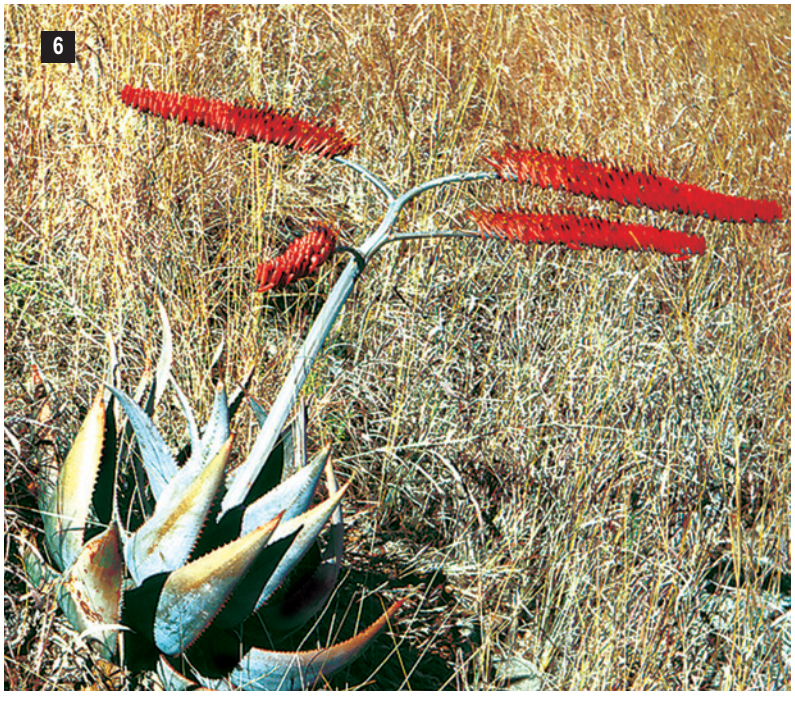
Distribution: Of limited distribution on the escarpment of Mpumalanga around Graskop.

Aloe omavandae **Van Jaarsveld** This species is another of the fairly recent cremnophile *Aloe* discoveries from the remote Baynes Mountains of NW Namibia. This is a pendant plant which cascades its clusters of rosettes down steep sandstone cliffs. The heavily-spotted leaves have a whitish cartilaginous margin with small reddish-brown teeth. The inflorescence is produced downwards and curves upwards to present the orange-red raceme in an erect position.

Distribution: It is endemic to the Baynes Mountains in NW Namibia, from W of the Epupa Falls eastwards to the Omavanda Mountain west of Omaramba.

Aloe orthopha **Christian et Milne-Redhead** This is a solitary stemless aloe with erect spreading to erect lanceolate, slightly in-curved immaculate, grey-green leaves with reddish to pinkish margins armed with pungent teeth. The inflorescence is 2–3 branched, sub-erect with almost horizontal racemes. The flowers are all upright, blood-red to light orange-red.

Darrel Plowes





Darrel Plowes



Judd Kirkel Welwitch



Judd Kirkel Welwitch

1. ***Aloe myriacantha*** in habitat on the Inganyani Mountain, Zimbabwe
2. ***Aloe namibensis*** in habitat near Ganab, SW of Walvis Bay, Namibia.
3 & 4. ***Aloe nubigena*** in habitat at Graskop, Mpumalanga
5. ***Aloe omavandae*** in habitat in the N Kaokoveld, Namibia
6. ***Aloe ortholopha*** in habitat in the Mtoroshanga Pass, a botanical reserve created for this species on the chrome-rich Great Dyke - serpentine rocks

Gerhard Beukes



Ernst van Jaarsveld



Distribution: This very localised species is found only in the Mtoroshanga Pass in the Umvokwe Hills on the Great Dyke, some 60 km NW of Harare in Zimbabwe. Some plants have also been seen in Zambia.

ALOE PACHYGASTER **Dinter** This is another acaulescent 'kraal-forming' species like *A. asperifolia*. The rosettes tend to be somewhat decumbent and radiate outwards. The leaves are bright grey-green and the margins are heavily armed with long pungent yellow spines which blacken with age. The inflorescence is simple, erect to sub-erect with the raceme long, narrowly cylindric-acuminate. The raceme is dense with the flowers coral-red.

Distribution: This is a desert to semi-desert plant, occurring in W central Namibia E of Lüderitz, towards Aus. It occurs near the Garub Pan, 20km W of Aus and on the Mickberg, S of Aus.

ALOE PARVIBRACTEATA **Schönland** This species is one of the maculate, acaulescent plants which suckers freely and forms large, dense groups. The leaves are narrowly lanceo-late, slightly canaliculate and spreading to sub-erect. The surface is covered with oblong, confluent, sometimes interrupted whitish spots which form transverse bands. The inflorescence is 1–3, forming consecutively from a rosette, branching above halfway to form loose, cylindric to acuminate racemes. Flowers are dull red with a longi-tudinal broad to narrow white edging of the perianth lobes.

Distribution: From Komatipoort in E Mpumalanga, through Swaziland to Pongola in the S, across S Mozambique to Maputo and onto Inhaca Island.

ALOE PARVIFLORA **Baker** This small rosulate grass aloe is similar to *A. minima*. It grows singly, rarely more. The few green leaves are purplish on the base on both surfaces with soft white prickles along the margins and base, are narrowly ligulate and canaliculate, up to about 18 cm long and grow almost horizontally to the ground before bending upwards. The unbranched inflorescence is up to about 40 cm tall with a densely capitate raceme of pinkish to white flowers.

Distribution: Poorly-known but it occurs in the central parts of KwaZulu-Natal.

ALOE PEARSONII **Schönland** This aloe forms erect tall much-branched shrubs with branching from the base. The leaves do not form rosettes but clothe the branches from bottom to top with dull-bluish to red, short, flat, almost triangular recurved leaves. The inflorescence is simple with an almost capitate raceme of red or yellow flowers.

Distribution: This prolific, though localised, species clothes the hillsides in their countless thousands of the western hill-slopes of the Richtersveld National Park in the general region of Helshoogte.

ALOE PEGLERAE **Schönland** Usually solitary but rarely forms small groups. This aloe is acaulescent but very rarely with a short stem and up to 30 cm tall. The leaves are erect, curved inward to sometimes being almost connivent at the apex to form a compact rosette. The colour is bluish-green to reddish green. The margins and keel are armed with not many sharp long reddish brown spines. The single inflorescence is usually simple but up to 3 branches do occur. The long cylindrical raceme is dull red with the flowers becoming pale yellow when open.

Distribution: Occurs along the Magaliesberg Mountains from Rustenberg to Pretoria also south of the Mountains on the N side of the long hills E of Magaliesburg.

ALOE PERFOLIATA **L.** This species is better known as *A. mitriformis*. It produces long decumbent stems of up to 2 m which sends off side shoots. The rosettes are decumbent. The leaves are triangular, dull-greenish-red and are armed with small white teeth. The dead leaves are persistent and cover much of the balance of the stem. The tops of the rosettes curve slightly upwards and produce 1–few

Judd Kirkel Welwitch





Gerhard Beukes



Philip Nel



Judd Kirkel Welwitch



Niels Jacobsen

1. ***Aloe pachygaster*** in habitat on the Huns Mountains near Goageb, Namibia.
2. ***Aloe parvibracteata*** in habitat
3 & 4. ***Aloe parviflora*** in habitat at Mvoti, KwaZulu-Natal
5 & 6. ***Aloe pearsonii*** in habitat on the Helshoogte, Richtersveld National Park
7. ***Aloe peglerae*** in habitat near Magaliesburg, NW Province
8 & 9. ***Aloe perfoliata*** (8) in habitat on the Swartberg Pass
(9) In habitat in the W Cape



Priscilla Burgoyne SANBI



Gerhard Beukes

Philip Nel





branched inflorescences. The racemes are erect and are densely capitate with dull red flowers. The incorporation of *A. comptonii* into this species is not accepted here.

Distribution: This is a W Cape species from the Riviersonderendberge Mountains in the south to the Bokkeveld Mountains E of Vanrhynsdorp in the north.

ALOE PETRICOLA **Pole-Evans** This species is acaulescent, solitary or forms small groups. The rosettes are dense with the leaves erect-arcuate, glaucous with a few scattered thorns on the surface. The margins are armed with pungent dark-brown teeth. The inflorescence is simple in young plants and 3—6 branched in older plants and about 1 m in length. The raceme is very cylindric, densely multi-flowered, usually bi-coloured with the unopened buds dull-red and the open flowers cream to ivory to greenish with prominent deep-brown anthers.

Distribution: Restricted to a small mountainous region of Mpumalanga around Mbombela (Nelspruit) where they favour sandstone slopes and granitic domes.

ALOE PICTIFOLIA **Hardy** This cremnophile plant forms groups of up to, or more than, seven rosettes. This 'painted leaf' species overhangs steep cliff faces in large clusters. The leaves are grey-green to reddish-green, liberally marked with white spots, narrow, recurved, somewhat twisted with small reddish-brown marginal teeth. The inflorescence curves upwards with a narrowly cone-shaped raceme of red flowers, with the mouth tinged with yellow.

Distributioni: Known from a small area N of Humansdorp.

ALOE PLOWESII **Reynolds** This small grass aloe is acaulescent with fusiform roots. The leaves form rosettes and the leaf-bases are amplexicaul with the leaves spreading to sub-erect. The upper surface is dull-green with a few scattered whitish spots on the lower portion and the lower surface has many whitish spots crowded near the base. The leaf-margins have small whitish teeth, more crowded towards the base. The inflorescence is simple with a cylindric-obconic raceme of scarlet flowers which are paler and somewhat greenish towards the tips.

Distribution: Of limited distribution in the Chimanimani Mountains in E Zimbabwe and narrowly into The W Chimanimani Mountains in Mozambique.

ALOE PLURIDENS **Haworth** This is a tall arborescent species, growing up to about 5 m tall. It is single-stemmed or with several tall branches. The rosettes have gracefully recurved pale green to yellowish-green to bright-green leaves with small white teeth on a narrow cartilaginous margin. The inflorescence is up to 3 to a rosette with up to 4 branches. The raceme is conical with coral red flowers which are green-tipped.

Distribution: Occurs in a broad coastal band from about Port St Johns in the former Transkei in the NE to about Humansdorp in the SW, inland to Somerset East, with an outlier NW of Durban in the Umgeni Valley.

ALOE POLYPHYLLA **Pillans** This is a remarkable species which has become very popular in cultivation, where it is not particularly easy to grow, maintaining its spectacular appearance as in the wild. The plant is usually single but does occasionally produce up to 3 rosettes. The leaves are flat becoming broader towards the tip where they abruptly narrowed with a pointed tip which characteristically dies back becoming dark purple. The pale green leaves are irregularly armed at the margins with pale small spines – sometimes on the upper half only, sometimes on the lower half sometimes on one side only. The rosette is spiral sometimes clockwise and sometimes anti-clockwise. The inflorescence has up to 8 branches topped with a capitate



Aloe plowesii in habitat in the Chimanimani Mountains, SE Zimbabwe
Photo Darrel Plowes



Judd Kirkel Welwitch



Darrel Plowes



Dawie Human

1. ***Aloe petricola*** in habitat on granite domes near Mbombela (Nelspruit), Mpumalanga
2 & 3. ***Aloe polyphylla*** (2) in habitat in the mountains of W Lesotho
(3) In habitat on the Phurumela Mountain, W Lesotho (Note the clockwise spiral of the plant in the upper picture and the anti-clockwise spiral of the plant in the lower picture)
4. ***Aloe pictifolia***) in habitat at Kouga, E Cape
5. ***Aloe pluridens*** in habitat 50 km NW of Grahamstown

Gerhard Beukes



Philip Nel



raceme with the flowers pink, shading to yellow at the tips of the opened flowers.

Distribution: This species is restricted to the steep basaltic slopes of the mountainous W parts of Lesotho.

ALOE PRATENSIS **Baker** This aloe is rather rare and is seldom encountered. It has a small, compact to larger clustered growth form. The leaves are glaucous, lineate with white mottling on the outside, dying off at the tips and heavily spined with pungent teeth, which arise from a whitish tuberculate base, along the margins and outside midrib. In dry times the leaves curve inwards, reminiscent of *A. peglerae* and they also retract under the soil if they are in sandy places, leaving only the upper half of the recurved rosette exposed. The stout, simple, to up to 7 inflorescences, are attractive, having a unique combination of green outer segments of the perianth, blending through yellow to the dominant colour of the bright orange flower

Distribution: Occurs in the E Cape and into S Lesotho. The plants from the S parts are less robust than those of the N parts

ALOE PRETORIENSIS **Pole-Evans** This solitary aloe is notable for its tall inflorescence, up to 3.5 m tall. It branches into several racemes and the flowers are usually a bright red, but occasionally orange-red colours do occur. The neat rosette is densely packed with bluish-green leaves which die back at the tips and the dying-back colour is reddish. The leaf edges are armed with pungent reddish thorns. The plant has a short stem. This beautiful aloe is ideal for gardens as it is easily cultivated.

Distribution: *A. pretoriensis* is widely distributed from Pretoria northwards into central Limpopo Province and eastwards to Mpumalanga and Swaziland.

ALOE PRINSLOOI **Verdoorn & Hardy** This is a solitary acaulescent species, but occasionally forms several rosettes. The leaves are a tight rosette of fleshy leaves, somewhat flat to slightly concave, marked with loosely transverse white oblong spots on both surfaces, but denser on the upper. The margins are armed with pungent spines and the tips of the leaves die back. The branched inflorescence is conical-capitate, with creamy pink flowers.



Aloe pruinosa in habitat near Wartburg, central KwaZulu-Natal
Photo Darrel Plowes

Distribution: Occurs in the Weenen area in KwaZulu-Natal, from Colenso to Muden.

ALOE PRUINOSA **Reynolds** This little-known distinctive maculate and solitary species is slow-growing. The stem is decumbent and rooted along its length. The rosette is dense bright-green canaliculate leaves are recurved and armed with pinkish-brown thorns and are densely spotted on both



Aloe prinslooi in habitat W of Colenso in KwaZulu-Natal
Photo Ernst van Jaarsveld



Judd Kirkel Welwitch



Judd Kirkel Welwitch

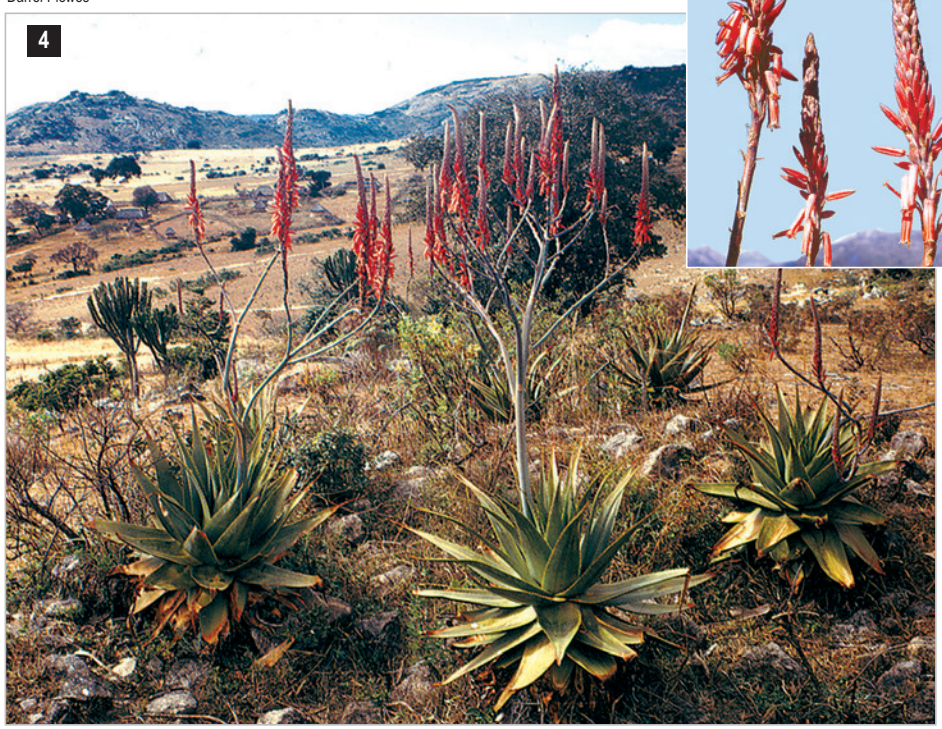


Judd Kirkel Welwitch

Philip Nel

1 - 3. ***Aloe pratensis*** in habitat in S KwaZulu-Natal,
4 & 5. ***Aloe pretoriensis*** (4) in habitat at the Manyika Communal Area, NW Mutare (5) in habitat near Pretoria, South Africa

Darrel Plowes







surfaces with 'H'–shaped whitish markings which are more or less confluent to be irregularly barring. The solitary inflorescence is up to 2 m long and is much-branched with pale pink to pale reddish-brown flowers. The flowers and peduncle are covered with a white bloom.

Distribution: Recorded only from around Pietermaritzburg and from Maphumulo, south of the Tugela River.

ALOE REITZII **Reynolds** This species is usually single but may divide into 2 or 3 rosettes. It is acaulescent, or with a very short decumbent stem, with upcurved lanceolate light-green leaves. The apex of the leaf is armed with a sharp thorn. The leaves are immaculate, without thorns except for a very few on the keel near the tips on the underside. The inflorescence is 2–6 branched from near the base with upright long cylindrical racemes of tightly-packed downward-pointing buds and opened flowers, these having turned yellow with long yellow exserted stamens.

Distribution: Occurs in an area in the Belfast district, to NW Gauteng across to near Barberton and a disjunct occurrence near Louwsburg in N KwaZulu-Natal.

ALOE REYNOLDSII **Letty** This species is acaulescent or very shortly caulescent. The plant divides at the summit to form 3—12 rosettes. The leaves are ovate-lanceolate, glaucous-green with H—shaped dull-white markings. The crenulate margins are minutely dentate with a cartilaginous pink border. The inflorescence is usually solitary, but occasionally with 2 produced successively. The raceme is sub-capitate, lax. The flowers are yellow.

Distribution: This rare species appears to be restricted to the hills and valleys along the Bashee River in the former Transkei, in the Eastern Cape.

ALOE RHODESIANA **Rendle** This small species forms longish stems with age, is solitary or divides into 3 or more branches. The erect leaves are up to 30 cm long, are green in colour with cartilaginous narrow white edge with minute firm white teeth. They are immaculate, canaliculate and taper to a sharp point. The inflorescence is simple, sometimes producing up to 3 per rosette. The raceme is cylindric-acuminate with the flowers salmon-pink with grey-green tips.

Distribution: Eastern Zimbabwe from near Mutare, northwards to Inyanga; also narrowly into adjacent Mozambique.

ALOE RUPESTRIS **Baker** This is a solitary plant which usually occurs in groups amongst trees. They are tall, up to 8 m high with a stem of which the top half is usually covered with persistent dead leaves. The leaves are armed with reddish pungent thorns, the leaf surfaces are smooth, dull to glossy deep green in colour. The inflorescence is much-branched and is produced near to the top of the rosettes, spreading over the top of the plant. The densely-flowered panicle is somewhat cylindrical. The yellow to bright orange opening flowers exsert long red stamens, which give a bi-coloured effect to the panicle. It is very popular in gardens but is susceptible to white scale (see 'pests and their control' in the Introduction).

Distribution: *A. rupestris* is widely distributed from the Tugela River in N Kwa-Zulu Natal and across to Muden in the W and Ithala in the NW and northwards to S Mozambique and E Swaziland.

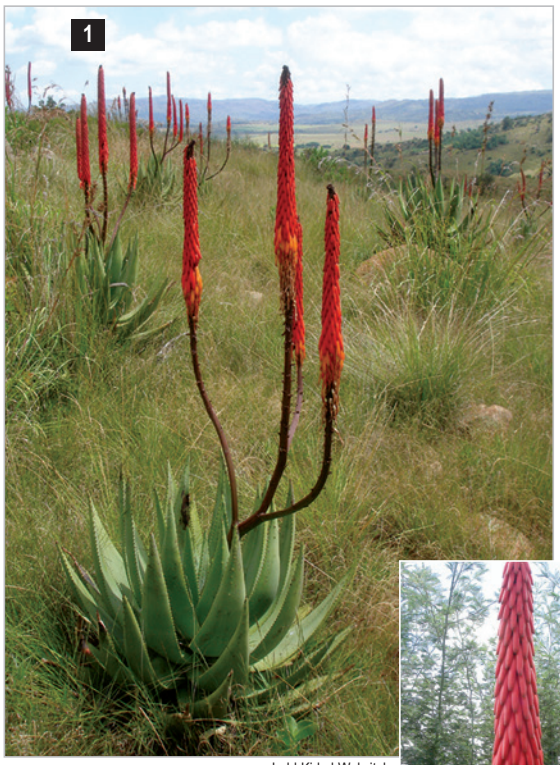


Pictures: 2 *Gideon Smith* SANBI,
3 *Judd Kirkel Welwitch*,
4 *Darrel Plowes*,
5 *Tim Peatling*

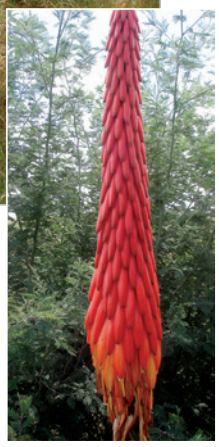








Judd Kirkel Welwitch





Tim Peatling





Org Fritzl



Gerhard Beukes

Aloe

1. ***Aloe reitzii*** in habitat in Mpumalanga
2 & 3. ***Aloe reynoldsii*** (2) in cultivation
(3) Close-up of the inflorescence
4 & 5. ***Aloe rhodesiana*** (4) in habitat on granite & dolorite at Nyanga, E Zimbabwe (5) in habitat on the Mozambique border at Mountain Home, Penhalonga, Eastern Highlands, Manicaland, Zimbabwe
6. ***Aloe rupestris*** (1) in habitat in the Sodwana District, N KwaZulu-Natal. (2) The inflorescence
7 & 8. ***Aloe saponaria*** (7) in habitat (8) In cultivation
9. ***A. saponaria* var. *ficksburgensis***, near Ficksburg, Free State Province

Judd Kirkel Welwitch



Aloe saponaria **(Ait.) Haw.** This is usually an acaulescent species but sometimes with a stem up to 50 cm. It is sometimes solitary but usually suckers freely to form dense groups. The slightly canaliculate leaves are narrowly to broadly lanceolate and spreading to somewhat erect, sometimes slightly recurved near the twisted, dry tips. The colour is pale to darkish green with white oblong dots which tend to coalesce into wavy transverse lines. The inflorescence is dichotomously branched and up to 30 cm long. The inflorescence is densely capitate to corymbose and the flowers are pendant, orange-scarlet to deep scarlet to yellow in colour. The variety *ficksburgensis* differs from the typical form mainly in its smaller leaves and in its smaller and broader racemes.

Distribution: This variable species has an very widespread distribution: from the Cape Peninsula, to the E Cape, through the former Transkei northwards through N and central KwaZulu-Natal, through the hilly parts of Swaziland then into E Zimbabwe in the Inyanga Province. The variety *ficksburgensis* occurs in the E Free State Province in the region near Ficksburg, Ladybrand, and also in the W Lesotho in the region of Leribe.

Aloe saundersiae **(Reynolds) Reynolds** This dwarf deciduous species, arguably the smallest species in Africa, is stemless with horizontal spreading leaves, barely 10 cm long, which turn upwards. The leaves are green with a few basal spots. The plants are single or in small groups. The inflorescence is simple and up to 17 cm tall, unbranched, with a capitate raceme of a few pinkish flowers.

Distribution: The restricted range is in the higher regions of central KwaZulu-Natal centred around Nkandhla in Zululand across to south of Greytown.

Aloe saundersiae Left: in habitat near Nkandhla, KwaZulu-Natal, *Photo Philip Nel*



Aloe speciosa **Baker** This unusual and quite spectacular aloe, which is sometimes single-stemmed and sometimes branching with several stems, has its rosettes produced sideways to the erect stem. The leaves are produced somewhat haphazardly and not in an orderly spiral and are tilted to the side, giving the plant a somewhat untidy appearance. The blue-green leaves have a pinkish edging of small and harmless teeth. The plant grows to 6 m, and the stem is clothed for about two thirds of its length with persistent dead leaves. The inflorescence is always simple and has a tall panicle of pinkish flowers which, when beginning to open usually longitudinally on one side of the panicle, turns yellow and exserts long reddish stamens. This is a very popular plant in gardens and is easy to cultivate. It usually occurs in very large numbers and covers the landscape.

Distribution: *A. speciosa* inhabits the SE Cape province and in the SE of the Western Cape Province.

Aloe spectabilis **Reynolds** This species is closely related to *A. marlothii*. It grows up to 4 m in height. Its stems are cloaked with persistent dead leaves. The plants are invariably single-stemmed. The leaves are dull green to reddish-green and are heavily armed along the edges and surface with pungent reddish to brownish teeth. It cannot be distinguished from *A. marlothii* when not in flower. One to three inflorescences are produced. The pedicel is upright, the branches are laterally produced and the floral panicle is erect or sub-erect and rather truncate. The flowers are evenly distributed around the axis. The exserted stamens are orange. The racemes are uni-coloured yellow to orange varying to the buds being red and the opened flowers are yellow to orange. This species is easily cultivated.

Distribution: *A. spectabilis* is confined to a limited area in central Kwa-Zulu Natal, in the hot and dry valleys of the Mooi and Tugela rivers, the Keate's Drift, centred around the small town of Muden.

Aloe spicata **L.f.** This is a large single or multi-stemmed species growing up to 2 m tall. The leaves are often reddish green in colour. The inflorescence is single often with more than one per rosette. The 'bottlebrush'-like raceme consists of dense tightly-packed yellow sessile flowers and the opening flowers have long exserted stamens and dark-



Philip Nel

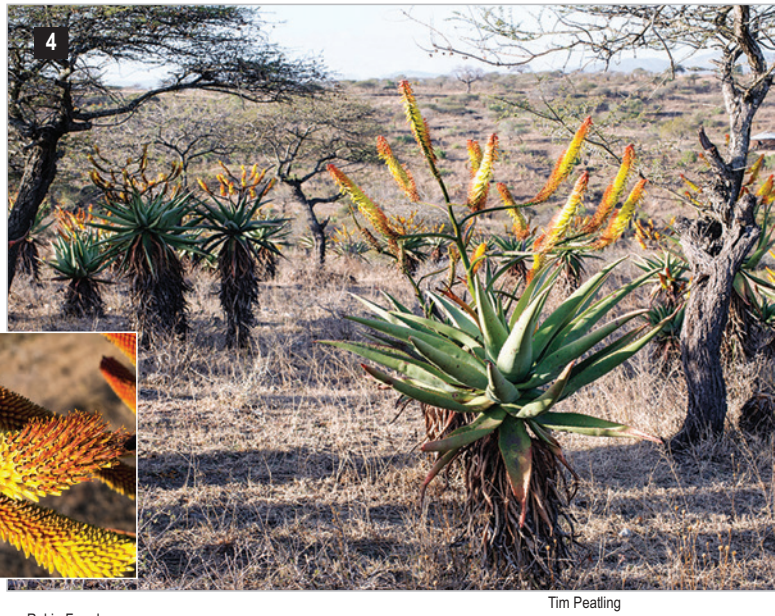


Judd Kirkel Welwitch



Gerhard Beukes

1 & 2. ***Aloe speciosa*** (1) in habitat in the E Cape showing the typical 'sideways' slant of the rosettes (2) Close-up of the beautiful inflorescence
3 & 4. ***Aloe spectabilis*** (3) in habitat 20 km NE of Kranskop, KwaZulu-Natal. inset: Close-up of a nearly horizontal Inflorescence. (4) In habitat near Dundee
5 - 7. ***Aloe spicata*** (5) In habitat in Mpumalanga (5) inflorescence from a plant at Tanganda Valley, Chipinga, Zimbabwe. (7) In cultivation at Mopani Camp, Kruger National Park



Tim Peatling



Tim Peatling

Philip Nel



Robin Frandsen



Darrel Plowes



coloured nectar which seems to climb up the raceme higher on one side than the other.

Distribution: This species is widely distributed from N KwaZulu-Natal through E Swaziland into much of the Kruger National Park and disjunctly in the Soutpansberg and SE Limpopo Province.

ALOE STRIATA **Haw.** This is a wide-spread and very attractive aloe which is much-favoured and frequent in cultivation. It is usually stemless but old specimens may have stems up to 1 m in length lying level with the ground. The rosettes are decumbent and the old dry leaves are persistent. This aloe is usually solitary but may on occasions develop up to 3 rosettes. The leaves are boat-shaped, glaucous, glabrous, without spines and have soft reddish or pinkish edges. Up to three, branched inflorescences are formed with campanulate racemes of rich-red, pinkish-red to orange-coloured, with yellow-tipped flowers. Yellow flowers are also occasionally encountered. This is a very easily cultivated plant. The species *A. karasbergensis, A. komaggensis, A. reynoldsii* and *A. buhrii,* which were previously transferred as subspecies of *A. striata*, they have been shown by Lavranos (Aloe 41:2–3, 50–51) to deserve their species status. This view is upheld in this work.

Distribution: *A. striata* is widely spread and in places in the E Cape it is very abundant. Plants are found from W of Laingsburg in the Western Cape Province, narrowly into the Northern Cape Province across to N of East London.

ALOE SUCCOTRINA **Lam.** This species is rarely solitary and often forms large stands. It has short stems which branch freely from the base. The stems are covered with old dried persistent leaves. The leaves are dull-green, stiff, erect slightly channelled with the margins armed with pungent white thorns. The inflorescence is usually simple with a conical to longish racemes of deep red flowers.

Distribution: This is a component of the Cape Floral Kingdom and one of the very few aloes of the region. It is restricted to the mountain slopes from Hermanus to Hout Bay in the Cape Peninsula.

ALOE SUFFULTA **Reynolds** This is a small species which is found under bushes. The stem is foliate from the base with long narrow leaves, sheathed at the base with striate marking on the sheath. The leaves recurve along their length with the upper surface deeply canaliculate, green in colour and heavily spotted with white oblong spots, which tend to coalesce into transverse bands. The remarkable inflorescence, which is too weak to be self-supporting, is up to nearly 2 m in length and is scandent in the branches of the bushes under which it grows. The loose few-flowered raceme has pink flowers. It is reported to be difficult in cultivation.

Distribution: Occurs in NW KwaZulu-Natal, northwards into the coastal strip of Mozambique, where it was first discovered near Vila Luiza, just N of Maputo. It occurs narrowly in the middle Save River Valley at Zamuchiya at the Lundi River confluence and is also believed to occur rarely in S Malawi.

ALOE SUPRAFOLIATA **Pole-Evans** This usually acaulescent species is also known as the 'book aloe' as in its early stage the leaves are distichous, gradually swivelling into a rosette form as the plant develops. The plant flowers at a young age. The leaves are lanceolate-acuminate, unspotted bluish at the base becoming reddish towards the tips, with the tips dying off and the dry section contorted. The inflorescence is simple with the raceme cylindric-conical. Flowers are rose-red to scarlet wth more than one inflorescence being produced at the same time.

Distribution: Occurs rather widely in the mountainous areas of N KwaZulu-Natal, Swaziland, Mozambique and south of Barberton in Mpumalanga.





Aloe succotrina Left: in habitat on Lions Head, Cape Town. *Photo Gerhard Beukes* Below: at Bettys Bay *Photo Judd Kirkel Welwitch*



David Frandsen





Robin Frandsen

Robin Frandsen



Tim Peatling

1 - 2. ***Aloe striata*** (1) in habitat near Graaff-Reinet, with the famous Spandaukop in the background.
(2) In habitat S of the Witteberge, SW of Matjiesfontein
3 & 4. ***Aloe suffulta*** in habitat near Sodwana Bay, N KwaZulu-Natal
5 & 6 ***Aloe suprafoliata*** (5) A young plant from 17 km S of Barberton, Mpumalanga prior to its 'twisting' into a rosette
(6) in cultivation in Johannesburg, just commencing its spiralling



Tim Peatling





Aloe swynnertonii **Rendle** This is a solitary species which sometimes forms small clumps. The plant is stemless. The rosettes are up to 1.5 m in diameter and the leaves are canaliculate and marked usually only on the upper surface with white spots. The leaves are purplish to dark green and lighter green underneath. The margins are armed with pungent teeth. The inflorescence is up to 2 m tall and is solitary with up to 15 branches. The flowers are deep red and the raceme is capitate.

Distribution: In South Africa it occurs from the Waterberg in Limpopo Province. It is more frequent in E Zimbabwe as far N as the Chimanimani Mountains. It also occurs across into W Mozambique.

Aloe tauri **Leach** This short-stemmed large aloe is known as 'Bullock's bottlebrush aloe' having been discovered by Mr E.J. Bullock. The leaves are brick-coloured, recurved and armed with short pungent teeth. The inflorescence is simple and topped with a bottlebrush-like raceme of yellow flowers opening to orange-coloured.

Distribution: Zimbabwe, near Mnene Mission, Igar Mountain: SW end of the Mweze Range about 50 km E of West Nicholson in south W Zimbabwe.

Aloe tauri in habitat at the Mbibi Mission, 100 km SW of Fort Victoria, Zimbabwe
Photo Darrel Plowes



Aloe thompsoniae **Groenew.** This is a small stemless, or with a very short stem, plant suckering freely and forming dense groups of dull-green, obscurely lineate leaves, copiously white spotted near the base on the underside and with a few whitish spots near the base on the upperside. The edges are cartilaginous with firm white teeth. The inflorescence is simple, with 1—3 per branch. The raceme is pyramidal-acuminate with the coral-red opening and open flowers pendulous.

Distribution: Limited to the Wolkberg in Limpopo Province near to Haenertsburg.

Aloe thorncroftii **Pole-Evans** this is a solitary acaulescent species which sometimes produces a short stem. The rosette is spreading with the broadly lanceolate leaves slightly canaliculate, smooth on both surfaces and armed with corneous, pungent reddish-brown teeth. Their colour is dull grey-green at the base and reddish towards the apices. Leaves of the young plants are rough to the touch and curiously speckled, this disappears with age. The inflor-escence is rarely branched, when it does it does so from near the base. The raceme is cylindric-acuminate and the flowers are dull rose-red to scarlet and green at the tips.

Distribution: Restricted to a small area in the mountains around Barberton in Mpumalanga.

Aloe thraskii **Baker** Known as the Strand or Dune Aloe, this is a really spectacular and stately aloe, inhabiting coastal sand dunes and never far from the coast or above 100 m above sea level. It is probably not suitable to grow this plant away from the coast, but in coastal gardens it is a must due to its exceptional appearance. The leaves are long, deeply canaliculate and very recurved. The leaves are armed with small reddish teeth along the edges and sometimes in a row along the mid-rib of the lower surface of the leaves. Young plants produce a single inflorescence but older plants produce up to four. Each inflorescence ramifies into, from 15 to 20 branches. Flowers are yellowish-orange and the exserted stamens are bright orange.

Distribution: *A. thraskii* is confined to a narrow coastal strip from N of Durban to S of Port Edward.



Darrel Plowes



Darrel Plowes

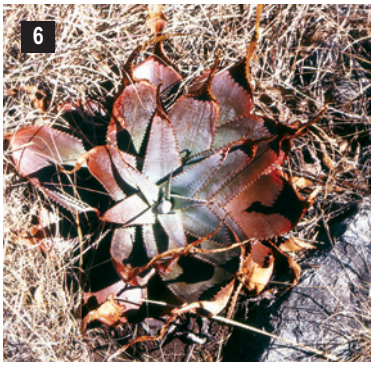
1 - 3. ***Aloe swynnertonii*** (1) In habitat in the Manga Reserve at Nyanga (2) from a plant from near Mutare, (3) In habitat in the Erin Forest Reserve, Blouberg, Limpopo Province
4 & 5. ***Aloe thompsoniae*** (4) in cultivation (5) In habitat
6 & 7. ***Aloe thorncroftii*** (6) in habitat
(7) In habitat on the Swaziland, South African border
8 - 10. ***Aloe thraskii*** (8) in habitat at Port Edward
(9) In habitat near Durban (10) Inset Close-up of the unflorescence



Niels Jacobsen



Unknown



Niels Jacobsen



Judd Kirkel Welwitch



Philip Nel



Tim Peatling



Tim Peatling



Aloe vanbalenii **Pillans** This species prefers flat rocky places but also occurs along the top of the Lebombo Mountains. It is usually a stemless, although sometimes very shortly-stemmed. It divides at the summit and branches at ground level to form dense groups. The green to copper-red leaves are very deeply channelled, long and strongly recurved, sometimes touching the ground. The inflorescence is 2—3 branches, erect with a narrow, conical raceme of buffish-yellow flowers.

Distribution: Locally common it occurs in KwaZulu-Natal from the Imfolozi River in the south to the Swaziland border and along the top of the Lebombo Mountains to N of Ingwavuma and onto the adjacent eastern plains.

Aloe verdoorniae **Reynolds** This is a small, stemless and solitary species with densely rosulate leaves which are bluish-grey, obscurely lineate, usually immaculate but with a few obscure oblong whitish spots. The margins are armed with deltoid, somewhat recurved reddish-brown spines on a continuous corneus reddish-brown margin. The inflorescence is 2—4 per plant and 2—3 branches, with a unicoloured cylindric raceme of coral-red flowers.

Distribution: Occurs from Cullinan in Gauteng in the W to Dullstroom and Belfast in Mpumalanga in the E.

Aloe verecunda **Pole-Evans** This short-stemmed grass aloe forms small groups or is sometimes solitary. The leaves are sub-erect, lanceolate and canaliculate and up to 30 cm long. The lower part of the outsides are densely spotted with the inside sometimes lightly spotted near the base. The inflorescence is simple with dense racemes of red flowers with the tips somewhat greenish.

Distribution: Widely distributed across central Gauteng, westward narrowly into the North West Province and eastward narrowly into Mpumalanga; near Polokwane (Pietersburg) in the Limpopo Province and Pietersberg in N KwaZulu-Natal.

Aloe verecunda in habitat in Johannesburg, Melville Koppies Reserve
Photos Judd Kirkel Welwitch





Aloe viridiflora **Reynolds** this distinctive and rare aloe has a compact dense rosette of sub-erect leaves with the apices slightly recurved. The colour of the leaves is pale glaucous green, they are immaculate with obscure longitudinal striae. The inflorescence is a branched panicle up to 1.5 m tall topped with a densely-flowered capitate raceme. The flowers are characteristically a peculiar greenish colour which is tinged with lemon about the middle. Like many of the Namibian desert species, *A. viridiflora* is very difficult in cultivation.

Distribution: This unique and rare Namibian endemic species is confined to a narrow range from the Hohenschein Mountains E of Windhoek to N of Rehoboth, where they are locally quite common.

Aloe vogtsii **Reynolds** This species has a short stem, with a rosette of broad, lanceolate to attenuate green leaves which are obscurely striate, with numerous white elliptic double spots coalescing into transverse wavy lines. The margins are armed with slightly recurved pungent teeth. The inflorescence is tall and branched with cylindric, slightly acuminate racemes of scarlet flowers.

Distribution: on the top of the Soutpansberg, NE of Louis Trichardt.

Aloe vossii **Reynolds** This grass aloe is similar to *A. verecunda*, differing in the longer leaves which are spotted on both sides. The plant is single or with small groups, up to about 50 cm tall. The elongated spots are scattered with the greater concentration lower down. The leaf-margins are very narrowly cartilaginous, with small, firm teeth. The inflorescence is simple, up to about 55 cm tall with a capitate raceme of red flowers.



Philip Nel

1 - 2. ***Aloe vanbalenii*** in habitat
3. ***Aloe verdoorniae*** in habitat near eMalahleni (Witbank) Mpumalanga
4. ***Aloe viridiflora*** in habitat on the Khomas Hochland, central Namibia
5. ***Aloe vogtsii*** in habitat at Entabeni,
E of Louis Trichardt, on the Soutpansberg Mountain
6. ***Aloe vossii*** in habitat on the Soutpansberg Mountains NE of Louis Trichardt



Philip Nel



Tim Peatling

Philip Nel



AW Klopper SANBI



Gerhard Beukes



Distribution: It is restricted to the Soutpansberg Mountains, centred roughly just N of Louis Trichardt.

ALOE VRYHEIDENSIS **Groenew**. This is usually a stemless but is also a single- very short-stemmed aloe which occasionally produces up to four stems. It attains the height of up to 2 m. The short stem is clothed with the old dead leaves. The upper surface of the leaves is canaliculate and the leaves are glaucous-green with a bluish tinge. They are armed along the edges with pungent reddish thorns. The inflorescence, which is up to 1½ m tall, is usually simple and with up to 5 being produced. The peduncle is produced at an angle with the racemes erect. The multiflowered racemes are cylindrical and very densely packed and the flowers are sessile. These are rose-coloured and the opening flowers, with their exserted lemon- to orange-coloured filaments and anthers, with a bright orange stigma, open successively upwards, like an advancing smouldering flame. This attractive species grows well in cultivation and should be given an alkaline soil. This work does not accept that this species is conspecific with *A. dolomitica*.

Distribution: *A. vryheidensis* occurs in N KZN-Natal it is centred in the mountainous parts around Louwsburg. In some localities it is massed.

ALOE WICKENSII **Evans** This very attractive and popular species has been transferred as a synonym under *A. cryptopoda*. This has not been upheld in this work. This iconic species is acaulescent or very shortly caulescent, usually solitary, does not sucker, but sometimes producing small groups. The leaves are lanceolate-ensiform and incurved. The leaves are coriaceous and dull-green in colour and unmarked. The margins are armed with deltoid blackish pungent teeth. Up to 3 inflorescences are produced simultaneously, branching from about the middle. The raceme is cylindric to obconic with distinctly bi-coloured flowers.

Distribution: Occurs in a broad band from near Mashishing (Lydenburg) across to near Polokwane (Pietersburg).

ALOE WILDII **(Reynolds) Reynolds** This charming little species is acaulescent sometimes multi-stemmed which stems develop at ground level. The leaves are sub-erect and strap-shaped, with the lower surface greenish brown with some spots lower down, decreasing upwards and the upper surface is copiously spotted lower down, decreasing upwards. The inflorescence is simple and up to 30 cm tall up to 50 cm tall in robust specimens. The flowers are bright orange-scarlet with green tips.

Distribution: Confined to the N Chimanimani Mountains on the E side of Zimbabwe and the W sides of Mozambique.

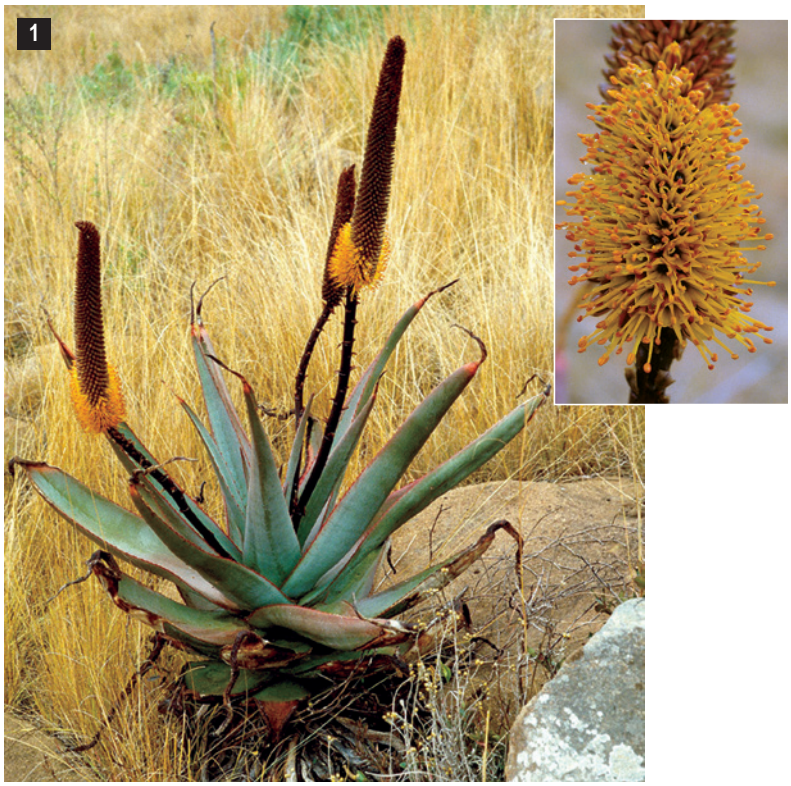
ALOE WELWITSCHII **(Baker) A. Berger** This species has grass-like, rosulate leaves up to 12 cm in length with a subterranean bulbous base. It is usually single. The sometimes spirally-twisted leaves are up to 20 cm long, greyish-green with small whitish marginal teeth and white markings at the base. The spring flowering inflorescence, which is up to 35 cm in length, has insignificant green to brownish-beige flowers which are semi-erect and which appear before the leaves are produced.

Distribution: Widespread and common on grassy plains throughout South Africa, Botswana and Zimbabwe, with the exception of the W Cape.

ALOE WOOLLIANA **Pole-Evans** This species is closely related to *A. chortolirioides*. It is similar to that species but is more robust. Unlike that species it does not rely on veld-fires to stimulate flowering. Stems are somewhat woody and branched about halfway up. The leaves are narrowly linear, dull-green flat with a few scattered white spots near the base. The inflorescence is simple–up to 45 cm with a densely capitate raceme of bright red flowers.



Aloe woolliana in habitat near Ohrigstad
Photo Neils Jacobsen



Gerhard Beukes



Gerhard Beukes

1. ***Aloe vryheidensis*** in habitat near Louwsburg, KZN-Natal
2. ***Aloe wickensii*** in habitat at Penge, Limpopo Province
3. ***Aloe wildii*** in habitat on granite & dolorite Inyanga, Zimbabwe,
4. ***Aloe welwitschii*** the plant in habitat showing the narrow, grass-like leaves
Inset: showing the *Haworthia*-like inflorescence

Darrel Plowes



Org Fritz



Distribution: Occurs from the mountains of N Swaziland to the Mpumalanga mountains and to Haenertsburg and near Tzaneen in the Limpopo Province.

ALOE ZEBRINA **Baker** This is a proliferous species and occurs often in very large stands. Solitary plants are also encountered. The dense rosette's colour is variously dull to darker green to purplish. The leaves are transversely marked with confluent longitudinally oblong spots. Easily confused with *A. davyana* but is summer flowering, whereas that species is mid-winter flowering. The inflorescence is much-branched with pinkish to light orange flowers.

Distribution: Very widely distributed from south W Mpumalanga, Gauteng, N North West Province central and W Limpopo Province, E Botswana, central and W Zimbabwe and into Angola.

ALOIAMPELOS Klopper & Gideon F. Smith

This plants from this genus have been excised from the genus *Aloe*. The plants are shrubby, or climbing, with sheathed immaculate leaves. The inflorescence is usually simple.

ALOIAMPELOS CILIARIS **(Haw.) Klopper & Gideon F. Smith** This is a member of the group which comprise of plants which are characterised by the rather thin sometimes scandent, sometimes bushy, multi-branched species with leaves which are thin and sheaths which clasp the stems and are minutely and softly toothed. The leaves of this species have characteristic longer teeth on the margins surrounding the sheath and lower parts of the leaves. The stems of *A. ciliaris* are long, sarmentose and scandent, growing up to 5 m long. The inflorescence is simple, about 30 cm long, broadly cylindric, longer in cultivation, in shape with deep red flowers.



Aloiampelos ciliaris This little aloe is common in cultivation. The plant in habitat near Peddie in the eastern Cape *Photo Gerhard Beukes*

Distribution: This bush-loving species is common in the regions from the Kei River mouth in the N to W of East London.

ALOIAMPELOS COMMIXTA **(Berger) Klopper & G.F. Smith** This is a shrubby species, densely grouped to form somewhat untidy bushes; up to about 1 m tall. The leaves are narrowly lanceolate-acuminate, erectly spreading with striated basal sheaths. Their colour is green, with the margins armed with firm white deltoid teeth. The inflorescence is simple with a sub-capitate raceme of yellowish to orange flowers.

Distribution: Restricted to the Cape Peninsula, south of Fishhoek.

ALOIAMPELOS DECUMBENS **(Reynolds) Klopper & Gideon F. Smith** This species is closely related to *A. gracilis* and *A. commixta*. It has long, thin branches which sprawl along the ground and over the rocks. The green leaves are lanceolate-deltoid and sheath the stem basally. The cartilaginous margins are armed with short soft to firm white teeth. The sparse inflorescence is erect with a raceme of scarlet flowers which turn brownish-green at the apex.

Distribution: Small isolated pockets in the Langeberg Mountain from W of Garcias Pass to as far E as Swellendam.

ALOIAMPELOS GRACILIS **(Haw.) Klopper & Gideon F. Smith** In keeping with its group of plants, this species has thin slender sheathed leaves. The plant is shrubby, which branches from the base with several erect stems up to about 2 m tall. The internodes (sheaths) have pale green striae. The leaves are dull green, unspotted, narrowly lanceolate and spreading; flat at the base and slightly canaliculate towards the tips. The inflorescence is usually simple but sometimes branched, with 2—3 to a stem. The panicle comprises a cylindrical, slightly conical raceme of bright red or scarlet flowers which are pendulous.

Distribution: Occurs in thicket vegetation in the Port Elizabeth, Uitenhage district.



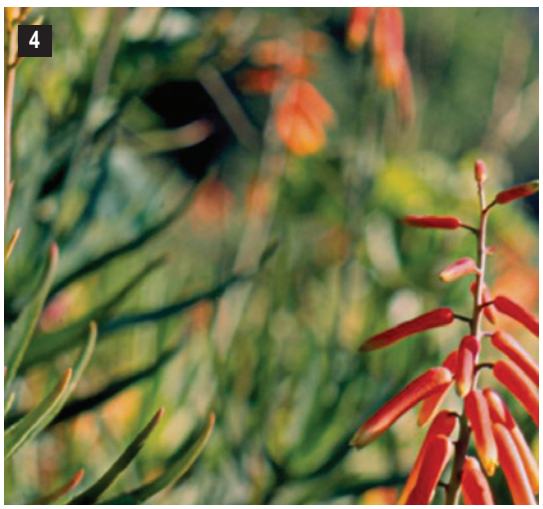
Tim Peatling



Tim Peatling



Tim Peatling



GF Smith

1 - 3. ***Aloe zebrina*** (1 & 2) in habitat near the Birchenough Bridge, SE Zimbabwe. (3) close-up of the rosette
4. ***Aloiampelos gracilis*** in habitat near Port Elizabeth
5 & 6. ***Aloiampelos commixta*** in habitat on the Vlakkenberg, Cape Peninsula
7. ***Aloiampelos decumbens*** in habitat in the SW Cape

Judd Kirkel Welwitch



Judd Kirkel Welwitch



Philip Nel



ALOIAMPELOS STRIATULA **(Haw.) Klopper & Gideon F. Smith** This is a large, rather untidy, but attractive, shrub growing up to 1.75 m. The sub-glossy green leaves are lanceolate, acuminate, spreading to recurved. The leaf-base is sheathed around the stem and is with prominent green lines, hence the species' name and small marginal teeth. The inflorescence is unbranched with a cylindric-conical raceme of reddish to orange-yellow flowers, with the open flowers showing prominent orange stamens.

Distribution: Occurs on the S Drakensberg mountains, southwards through Lady Grey, across to W of Graaff-Reinet and southwards to Queenstown.

ALOIAMPELOS TENUIOR **(Haw.) Klopper & Gideon F. Smith** This is a small to medium untidy species with slender sarmentose stems up to 3 m with the leaves crowded at the apex and laxly lower down the stems. The stems arise from a large rootstock which becomes woody at or near ground level. The leaves are immaculate and grey-green with small marginal teeth. The inflorescence is solitary with a dense to lax cylindric raceme of yellow to orange to red flowers. The three recorded varieties are probably simply extreme floral colour variations.

Distribution: Occurs in a broad band from the coast inland from south of East London to near the KwaZulu-Natal border.



Aloiampelos striatula in habitat in the S. Drakensberg, KwaZulu-Natal
Photo Judd Kirkel Welwitch

ALOIDENDRON **Klopper & Gideon F. Smith**

The plants from this genus have been excised from the genus *Aloe*. They are shrubby to arborescent succulents with smooth, sometimes fissured bark.

ALOIDENDRON BARBERAE **(Th. Dyer) Klopper & Gideon F. Smith** This tree aloe is the tallest, but not the bulkiest, of the genus. It can achieve the height of 18 m. Better, and formerly known as *Aloe bainesii*, this impressive plant is popular in gardens and public places. The trunk can measure an impressive 3 m in diameter, branches copiously and rebranches, forming a rosette of ensiform and deeply channelled leaves with the margins armed with firm small teeth. The dead leaves are not persistent. The inflorescence is branched with about 3 racemes. The raceme is cylindric, rose to rose-pink.

Distribution: It occurs from near Grahamstown in the south, northwards in a broad band as far W as Muden in KwaZulu-Natal, through Swaziland to N of Mashishing (Lydenburg) in Mpumalanga.

ALOIDENDRON DICHOTOMUM **(Masson) Klopper & Gideon F. Smith** This is one of the largest of the aloes and can reach up to 9 m in height. It is more bulky than the more slender *A. pillansii* and *A. barberae*, but not as tall. The accompanying photos show the more typical plant with fewer and more open branches and the unusually dense, many branched, squatter specimens from SW of Upington, S of Louisvale. Unlike *A. pillansii* the inflorescences are produced above the leaf rosettes. The flowers are bright yellow. The light yellowish-brown bark forms irregularly large to small flakes with sharp edges. *A. dichotomum* inhabits dry, semi-desert. It is found on level sandy or rocky ground and on rocky hills. It is less difficult in cultivation than *A. pillansii* but does not thrive in regions of high rainfall. Its compact branches is often the nesting site of the social weaver.

Distribution: *A. dichotomum* is found in a broad swath from near Kuruman, southwards to south W of Loeriesfontein; westwards to near the mouth of the Orange River. It also occurs N of the river northward to about the Etosha Pan. It is missing from the extremely dry coastal regions of the Namib Desert, as well as the sandy inland Kalahari Desert.



Gerhard Beukes



Gerhard Beukes

1 & 2. ***Aloiampelos tenuior*** (1) in habitat near Peddie, E Cape
(2) in habitat at the Mthatha Falls, E Cape
3. *Aloidendron barberae* formerly *Aloe. barberae* in habitat. Inset: Detail of the inflorescence
4 & 5. ***Aloidendron dichotomum*** (4) in habitat, in the Richtersveld National Park, Inset: a close-up of the flowers
(5) In habitat, S of Louisvale, SW of Upington. Note the different form



Tim Peatling





Judd Kirkel Welwitch

Robin Frandsen



***ALOIDENDRON PILLANSII* (L. Guthrie) Klopper & Gideon F. Smith** *Aloidendron pillansii* is found in only very arid country. It is a close relative of *A. ramossisimum* and *A. dichotomum* differing from *A. dichotomum* in that it is more slender, less-branched, generally taller and its inflorescences are produced below and not above the leaf rosettes. It can reach in excess of 10 m in height. The stems are thick, with flaky bark similar to *A. dichotomum*. Its dichotomous branches are generally fewer in number than those of *A. dichotomum*. The flowers are yellow and are similar to those of *A. dichotomum* and *A. ramossisimum*. This rare and endangered tree aloe is very specific to its habitat and does not do well or even survive when grown in wetter climes. It should be remembered that, though it occurs in areas almost without rain, it is abundantly provided with water in the form of fog from the cold Atlantic which, of course, does not soak the roots.

Distribution: *A. pillansii* is confined to the NW Richtersveld and is also found northwards along the Namibian desert strip as far as in the vicinity of Brandberg.

***ALOIDENDRON RAMOSISSIMUM* (Pillans) Klopper & Gideon F. Smith** A close relative of *A. dichotomum* it could perhaps be included as a subspecies. Some taxonomists hold that it is conspecific with *A. dichotomum* but this is not upheld in this work as it differs substantially from that species in that it is usually many more branched, much more so than with *A. dichotomum*, and in its lack of a definite trunk. It is a shrub, usually 2 m but can be up to 3 m in height. The flowers are similar, if not stockier, their colour is bright yellow. Cultivation requirements of this species are the same as that of *A. dichotomum*.



Aloidendron ramosissimum in habitat at Helskloof, Richtersveld *Photo Gerhard Beukes*



Distribution: *A. ramosissimum* is confined to the mountainous regions of the Richterveld National Park, growing in association with *A. pillansii* and also in the mountains of Namibia, just N of the Park across the Orange River.

***ARISTALOE* Boatwr. & J.C. Manning**

This monotypic *Haworthia*-like genus has been excised from the genus *Aloe*.

***ARISTALOE ARISTATA* (Haw.) Boatwr. & J.C. Manning**

This is a charming small, usually densely clustering, compact species, which is up to 15 cm in diameter, is well-known in cultivation. The rosettes are acaulescent; the leaves of the dense rosettes are narrowly lanceolate, incurving ending in a long dry awn. The edges are armed with soft white teeth and the upper surfaces have white tubercles. The inflorescence is occasionally simple sometimes with up to 6 branches. The raceme is somewhat capitate with red flowers. The portion of the flower which faces the sun is a deeper red than the rest.

Distribution: It occurs from near Graaff-Reinet across to Zastron, southwards near Cathcart, northwards into the E Free State and W Lesotho; along the Drakensberg in Natal to as far N as Harrismith.

***GONIALOE* Boatwr. & J.C. Manning**

This genus has been excised from the genus *Aloe*. It includes the so-called 'partridge-breast' or 'Kanniedood' plants.

***GONIALOE VARIEGATA* (L.) Boatwr. & J.C. Manning**

This well-known species rejoices in the common names of *Kanniedood* (can't die)—although it is not particularly easy in cultivation—and the *Partridge-breast* aloe, by virtue of its strongly-keeled, distinct transverse banding giving the appearance of a partridge breast. This is a very stoloniferous species, sometimes forming largish clusters. The hard dark-green leaves are erect and recurved, strongly keeled on the outside and deeply canaliculate on the inside. Both surfaces are strongly marked with oblong



Robin Frandsen



Gerhard Beukes

1 & 2. ***Aloidendron pillansii*** (1) in habitat in the Richtersveld National Park
(2) Close up of the decumbent flower spikes, as opposed to *A. dichotomum's* erect spikes (see P. 63). Picture from Cornellskop, Richtersveld
3 - 5. ***Gonialoe variegata*** (3) in habitat near Vosburg, N Cape
(4) the inflorescence
(5) In habitat W of de Rust, S Cape
6 & 7. ***Aristaloe aristata*** (6) in habitat.
(6) In habitat in SW KwaZulu-Natal
(7) In habitat near Elliot in the E Cape
Inset: Detail of inflorescence



Pics 6 & inset Judd Kirkel Welwitch



Gerhard Beukes





Pic 3 Darrel Plowes
Pic 4 Tim Peatling
Pic. 5 Robin Frandsen





white dots which tend to coalesce to form broken bands, particularly so on the outsides of the leaves and with a hard corneous white edge. The inflorescence is usually simple or sometimes 1—2 branched. The raceme is lax and cylindric and the flowers are pinkish-red and very occasionally yellow.

Distribution: This species is widely spread throughout the extreme SW Free State, the W Great Karoo from the Fish River Valley in the E to W of Laingsburg and into the Little Karoo, northwards to the Richtersveld and across into S Namibia.

KUMARA Medikus

This genus has been reinstated. It was originally described in 1786. It is characterised by the 'fan-shaped' disticous leaf arrangement.

KUMARA DISTICHA **Medikus** Better-known as *Aloe plicatilis t*his unusual 'fan aloe' is confined to the Fynbos in mountainous country. The arrangement of its ligulate, distichous leaves is shared only with *K. haemanthifolia*, also an inhabitant of the Fynbos. It forms a small tree with a short trunk, up to 5 m in height. The dead leaves are easily shed, leaving the much-branched stems free of persistent dead material. The inflorescence is never branched, but the plant is prolific in the number of its inflorescences. The unicoloured flowers are scarlet. This plant does not thrive well outside its winter rainfall habitat, but may be cultivated successfully if only limited water is supplied in summer.

Distribution: *K. disticha* is confined to mountainous slopes on the mountains E of Stellenbosch, northwards, the Paardeberg hills, N of Paarl and also on the mountain chain from Worcester and Ceres to N of Tulbagh.

KUMARA HAEMANTHIFOLIA **(A. Berger & Marloth) Boatwr. & J.C. Manning** This unusual and beautiful species is not particularly easy in cultivation. Because of human population pressure on the natural foraging ground for the baboons, which live in this plant's natural mountainous habitat, the apes tear off the fruiting heads for food, making the plants vulnerable in their range. The plants are rarely solitary, suckering freely and producing large clumps of up to 20 rosettes. The distichous, lorate leaves are up to about 18 cm long. The leaves are canaliculate, and flatter towards the top, dull glaucous green, with a reddish margin, slightly crenate. The flowers are simple, up to 45 cm tall. The orange-red to scarlet racemes are capitate.

Distribution: Confined to mountains of the SW Cape from N of Tulbagh to near Stellenbosch.

ASTROLOBA Uitewaal

The plants of this genus are very rigid and caulescent. They are few- to many-stemmed with hard spiralled pungent leaves. The flowers differ from *Haworthia* in the distinctly 'regular' flowers which open like a star.

ASTROLOBA BULLULATA **(Jacq.) Uitewaal** This neat compact species grows up to 60 cm tall and is not as freely-branched from the base as other related species. The leaves are deep olive green, mat with glossy edges and with darker coloured tubercles on the outer surfaces. The white to greenish flowers are attractive.

Distribution: Recorded from the Ceres Karoo across to Sutherland and southwards to Laingsburg, Matjesfontein.

ASTROLOBA CONGESTA **(Salm-Dyck) Uitewaal** This species form large groups. The stems are in straight rows. The unkeeled leaves are light to dark glossy green. The flowers are greenish, with white to cream lobes.

Distribution: Ranges from Cradock to around Grahamstown in the Eastern Cape.

ASTROLOBA CORRUGATA **N.L. Meyer & G.F. Smith** This is a solitary or few-clustered plant, somewhat similar to *A. foliolosa* but with the undersides of the leaves longitudinally corrugated and the upper sides tuberculate. The leaves are with a margin. It grows from 30–66 cm tall. The flowers are white with green or pinkish tinge.

Distribution: Recorded from the Little Karoo from Montagu to Ladismith and on the S side of the Langeberg from Worcester to Riversdale.



Pic 1 & inset Judd Kirkel Welwitch



Philip Nel





Judd Kirkel Welwitch



Kuba Jilemicky



Kuba Jilemicky

1. ***Kumara plicatilis*** in habitat on the Paardeberg, SW Cape . Inset the inflorescence
2 & 3. ***Kumara haemanthifolia*** massed in habitat on the Paardeberg, SW Cape
4. ***Astroloba bullulata*** in habitat near Laingsburg
5. ***Astroloba congesta*** in habitat at Committees Drift, NW of Grahamstown
6. ***Astroloba corrugata*** in habitat W of Barrydale in the Little Karoo



Kuba Jilemicky



Astroloba foliolosa **(Willd.) Uitewaal** This is a wide-spread species which is freely branched with stems up to 50 cm tall. They are closely covered with somewhat rounded triangular leaves which are smooth and glossy, sometimes with a whitish margin. The flower stalks are somewhat stout and dry out in the form of persistent woody stalks.

Distribution: Occurs from west of Willowmore in the Eastern Cape, across to E of Albany in the E Cape, northwards to Graaff-Reinet. It also reported to occur in the Little Karoo.

Astroloba herrei **Herre** The stems of this species are up to 20 cm tall with closely packed leaves with a few branches from the base of the plant. Leaves are somewhat imbricate, in spiral rows, ovoid ending in a terminal sharp brown point. Their colour is green, somewhat waxy, with the underside rounded and sharply keeled towards the tip. Margins are glossy and minutely tuberculate. Flowers are very similar to those of the haworthias.

Distribution: Known only from the region around Prince Albert in the southern Great Karoo.

Astroloba rubriflora **(L. Bolus) Gideon F. Sm. & J.C. Manning** This handsome clustering species grows up to 20 cm tall. The five-seried leaves are glabrous, bluish-green with long, narrow, red flowers, they are hard with a sharp tip.

Distribution: An inhabitant of the southern Cape and is endemic to the Robertson Karoo.

Astroloba spiralis **(L.) Uitewaal** This is a short-stemmed species, with stems up to 20 cm in length. The leaves are bluish-grey, smooth, pungent, more lanceolate and somewhat longer than the other species. They are somewhat keeled near the undersides. The lobes of the flowers are transversely rugose.

Distribution: Occurs in the Little Karoo and NE to Graaff-Reinet in the E Cape

Bulbine Wolf

This is a large genus of non-succulent and succulent plants which are sometimes massed to give an impressive display of spring flowers. Of themselves, like the weedy mesembs, they are generally unimpressive as single specimens and of not much interest to the succulent enthusiast. One species *B. mesembryanthoides*, could be regarded as of interest and is included here.

Bulbine mesembryanthoides **Haw.** This is a wide-spread species. It is a dwarf plant which has two subspecies: subsp. *mesembryanthoides* and subsp. *namaquensis*. The nominate subspecies forms two leaves and 3—4 rosulate leaves in older plants. The leaves are only truncate when older due to the weathering of the apex,. It is usually largely subterranean with the windowed, translucent apices above ground. Subsp. *namaquensis* differs in its production of a single leaf with its flat apex at the surface and a second falcate and terete vestigial leaf. The raceme is shorter and with fewer flowers than the nominate ssp.

Distribution: Subsp. *mesembryanthoides* occurs across from Robertson in the W Cape to Graaff-Reinet, and southwards to Uitenhage in the E. Subsp. *namaquensis* occurs in the S Richtersveld, southwards to W of Springbok.

Gasteria Duval

The genus *Gasteria* is endemic to South Africa, with the exception of a short intrusion of *G. pillansii* into the extreme southern parts of W Namibia and also in Swaziland. It is popular in cultivation and the appeareance of the attractive racemes of flowers are heightened by the dictichous or rosulate formation of the firm and attractive leaves.

Gasteria acinacifolia **(Jacq.) Haw.** This is a large, solitary or cluster forming species, which has a flat-topped paniculate inflorescence. Leaves are lanceolate and the upper parts of the leaves take on a reddish colour. Flowers are glaucous pink with green tips.

Ernst van Jaarsveld





Kuba Jilemicky





Robin Frandsen



Judd Kirkel



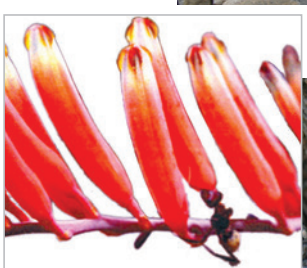
Kuba Jilemicky





Kuba Jilemicky

1 & 2. ***Astroloba foliolosa*** (1) in habitat on the Springbokvlakte, S of Steytlerville.
(2) In habitat W of Prince Albert. Inset: close-up of an inflorescence
3. ***Astroloba herrei*** in habitat near Prince Albert
4. ***Astroloba rubriflora*** in habitat near McGregor, SWCape.
Inset: Flowers of the species. Previously *Poellnitzia rubriflora*
5. ***Astroloba spiralis*** in habitat S of Calitzdorp, Little Karoo
6. ***Bulbine mesembryanthoides*** in habitat N of Oudtshoorn.
Inset: close-up of an inflorescence
7 & 8. ***Gasteria acinacifolia*** (7) in habitat between Beach View & Sea View
(8) In habitat in coastal sand dunes at Natures Valley, S Cape



Org Fritz, inset: Judd Kirkel Welwitch



Ernst van Jaarsveld



Distribution: It prefers coastal conditions and occurs on vegetated sand dunes from Knysna to East London.

GASTERIA ARMSTRONGII **Schönland** This is a cryptic species, difficult to locate when not in flower. It is distichous, green with transverse rows of whitish to pinkish tubercles. The leaves are shortly lorate, truncate and apiculate. The plant is closely adpressed to the ground. The inflorescence has a panicle of bright reddish-pink flowers.

Distribution: Occurs from W of the Gamtoos River to near Port Elizabeth.



Gasteria armstrongii In habitat W of Port Elizabeth *Photo Ernst van Jaarsveld.*
Inset: inflorescence *Photo Niels Jacobsen*

GASTERIA BATESIANA **G.D. Rowley** This is an attractive species which forms small groups. It is characterised by its small rosettes of densely tuberculate triangular to almost linear recurved leaves. The inflorescence is unbranched. It occurs on sheer rock faces, preferring light shade. Var. *dolomitica* has slener elongated leaves.

Distribution: Found in sub-tropical thicket and mixed bushveld from Nkandhla, Zululand, in the S to as far N as southern Mpumalanga. Var *dolomitica* occurs on sheer dolomitic cliffs in Mpumalanga, nort of the nominate species.

GASTERIA BAYLISSIANA **Rauh** This rare species is a beautiful dwarf, barely 40 mm tall, forming dense clusters. The distichous leaves are 'pearly' on both surfaces. The usually simple, rarely branched, inflorescence bears shiny globose flowers which are red-pink with yellowish tips.

Distribution: Steep rock-faces in light shade on the top of the Zuurberg, 80 km N of Port Elizabeth on the farm Oudeklip.

GASTERIA BICOLOR **Haw.** This widespread species is characterised by its distichous or spirally twisted, strap-shaped leaves. The leaves are deep green, liberally marked with elongated pale green to whitish markings, which are sometimes coagulated. Two varieties are recognised, with the nominate having leaves up to more than 25 cm long and the small var. *liliputana* up to 10 cm long.

Distribution: Widely distributed in the E Cape from Humansdorp to Alexandria and N to Fort Beaufort. The variety *liliputana* is confined to the region from the E Zuurberg Mountains to the Kapsrivierberge, east of Grahamstown.

GASTERIA BRACHYPHYLLA **(Salm-Dyck) van Jaarsv.** Characterised by its lorate distichous, shiny, smooth leaves, with obtuse, sometimes acute apices. They are sub-erect to spreading. The white dots are small and sometimes coalesce into irregular bands. The var. *bayeri* has asperulous leaf surfaces.

Top: ***Gasteria brachyphylla*** in habitat at Bassonsrust, SW of Cradock.
Bottom: ***G. brachyphylla* var. *bayeri*** in habitat S of Oudtshoorn
Photos Kuba Jilemicky







Ernst van Jaarsveld



Ernst van Jaarsveld

1 & 2. ***Gasteria batesiana*** (1) in cultivation, a plant from Sifula, W of Isandhlwana in Zululand (2) ***G. batesiana* var. *dolomitica*** growing on dolomite above the Olifants River in Mpumalanga
3. ***Gasteria bicolor*** in habitat at Coegakop, near Coega, E Cape. Inset: the inflorescence from a plant from Coega,
4 ***G. bicolor* var. *liliputana*** in habitat near Driver's Bush, E of Grahamstown
5. ***Gasteria baylissiana*** in habitat at Oudekraal, E Zuurberg, E Cape



Niels Jacobsen, inset Ernst van Jaarsveld



Ernst van Jaarsveld



Distribution: *Gasteria brachyphylla* occurs from N of the Zuurberg, SW towards the Little Karoo, where it is widespread S of the Swartberg. The variety *bayeri* occurs near Ladismith and Calitzdorp.

***GASTERIA CARINATA* (Mill.) Duval** This is a variable rosulate species with leaves which are lorate to acuminate. The surfaces are usually tuberculate. They form small groups up to 20 cm tall. The inflorescence is simple, rarely branched. Several varieties are recognised, but some with little justification because of the variable nature of the species. The best-known is var. *verrucosa.*

Distribution: *Gasteria carinata* occurs in the S Cape, south of the Langeberge, preferring Renosterveld, from Hermanus to Mossel Bay. The variety *verrucosa* occurs from E of the Breede River to W of De Hoop in the SW Cape.

***GASTERIA CROUCHERI* (Hook.f.) Baker** This is a large species, up to 45 cm tall, which is characterised by its lanceolate-triangular, rarely linear, leaves which are smooth and sometimes glaucous, with excentric keels. The flat-topped inflorescence is rarely simple, with pink, white-striped flowers.

Distribution: This coastal species inhabits inland as far W as Richmond and Pietermaritzburg. It occurs from near the Mkuze River in Zululand, southwards to Mkambati Nature Reserve, in the former Transkei.

***GASTERIA DISTICHA* (L.) Haw.** This species is characterised by its distichous strap-like, asperulous leaves with rounded tips and with a small apical point. The inflorescence is up to 20 cm tall. The inflorescence is simple, occasionally branched. Flowers are small. This distinctive species closely resembles *G. pillansii* but is not stoloniferous. Var. *robusta* has short, fat leaves and flowers in summer.

Distribution: Occurs from Beaufort West to the Swartberg in the Great Karoo, in the Breede River area from Worcester to Drew and in the Koo Valley of the W Cape. Var. *robusta* is found from west of the Tanqua Karoo to Beaufort West, in the Great Karoo.

***GASTERIA DOREENIAE* van Jaarsveld & E.A. van Wyk** This small, stemless species, up to 75 cm tall, has distichous, strap-like, smooth leaves with prominent apical points. The inflorescence is simple or branched with pink-based, whitish with green striped petals.

Distribution: Recorded from the Swartwaterspoort, near Riebeek East, E Cape.

***GASTERIA ELLAPHIEAE* Van Jaarsv.** The is an attractive species which is solitary, or in small clusters. It has small rosettes, up to 40 cm tall, with triangular tuberculate leaves which are spreading to recurved. The much-branched inflorescence has small orange-pink flowers.

***Distribution*:** Occurs about 20 km W of Patensie, in the vicinity of the Kouga Dam in the E Cape.





Gasteria disticha Top: in habitat at Potjieskloof, SW of Uniondale, S Cape
Gasteria disticha* var. *robusta below: in habitat at Buitenstekloof, NE of Prince Alfred Hamlet, SW Cape *Photos Kuba Jilemicky*



Kuba Jilemicky



Ernst van Jaarsveld



Ernst van Jaarsveld

Ernst van Jaarsveld



Ernst van Jaarsveld



Ernst van Jaarsveld



Ernst van Jaarsveld

Ernst van Jaarsveld



Ernst van Jaarsveld



1 & 2. ***Gasteria carinata*** in habitat at the Great Brak River
3. ***Gasteria* var. *carinata*** (known as f. *glabra*) in cultivation from N of Bredasdorp
4. ***G. carinata* var. *verrucosa*** in cultivation.
5. ***Gasteria croucheri*** in habitat the Mtentu River, the N border of the Mkambati Game Reserve in the former Transkei.
6. ***G. croucheri* var. *pendulifolia*** in habitat N of Bredasdorp
7. ***Gasteria ellaphieae*** from the type locality at the Kouga Dam, W of Patensie, E Cape
8. ***Gasteria doreeniae*** in habitat at the only-known locality from the Swartwaterspoort, near Riebeek East, E Cape

Gasteria excelsa **Baker** This is a solitary and robust erect species growing as tall as 60 cm. The triangular leaves are sharp-edged and smooth, with the lower surface distinctly keeled. The inflorescence is several to a plant and up to 1 m long with large panicles of pink flowers.
***Distribution*:** Widely distributed from Kentani in the former Transkei, southwards to E of Port Elizabeth.

Gasteria glauca **Van Jaarsv.** This attractive and easily grown species is decumbent to erect, forming dense clusters. It is rosulate, but distichous when newly developed. The plant is up to 70 cm tall with shiny glaucous, strap-like to lanceolate leaves. The lower surface is keeled and the margins are finely denticulate. The inflorescence is simple with white-tipped orange-red flowers.

Distribution: Occurs in the upper reaches of the Kouga River, NW of Joubertina in the E Cape.

Gasteria glomerata **Van Jaarsv.** This remarkable very proliferous cremnophile species forms rounded clusters of many tightly-packed leaves which are paired glaucous and finely tuberculate. The leaves are shortly strap-shaped ending in a sharp point. Plants tend to lose their compactness in cultivation. The flowers are bright reddish-pink.



Gasteria excelsa from Hunts Drift, SW of East London
Photo Ernst van Jaarsveld

Distribution: Confined to steep cliffs at the Kouga Dam, about 20 km E of Patensie in the E Cape.

Gasteria nitida **Salm-Dyck** This small species is either solitary or proliferating from the base. The smooth leaves are short, triangular and sharp-pointed, green to reddish and heavily spotted. The rosette is spreading to ascending up to 20 cm tall. The inflorescence is simple or branched and the flowers are a striking red-pink.

Distribution: Occurs from Uniondale in the W across to the Great Fish River mouth, generally near to the coast.

Gasteria pillansii **Kensit** This is an inhabitant of the more arid and desert regions. It is characterised by its lorate, distichous, spotted leaves and asperulous surfaces. The plants are stoloniferous and form large groups. The inflorescence is a simple, sometimes branched, panicle of large flowers.

Distribution: Occurs in Namaqualand a in the extreme SW of Namibia. The variety *pillansii* occurs in the Ceres Karoo, then NW to the coast from Nieuwoudtville to the Orange River in the N. The variety *ernesti-ruschii* is found in the coastal mountains from Naroegas Mountains, E of Kleinzee northwards to the Lorelei, across the Orange River, N of the Richtersveld National Park and var. *hallii* occurs in the Oograbies Mountains, E of Port Nolloth.

Gasteria polita **Van Jaarsv.** Is an attractive, small to medium usually solitary rosulate species with lorate leaves with excentric keels. White spots concentrate along the keels and margins. The simple inflorescence bears basal pink flowers with tips that are greenish, with white stripes.

Distribution: Occurs at Plettenberg Bay in the S Cape.

Gasteria pulchra **(Aiton) Haw.** This solitary or small grouping species is recognised by its erect, spreading, linear, triangular, nearly smooth leaves, which are slightly keeled. The leaves are usually densely marked with white spots, sometimes coalescing into irregular bands. The inflorescence is tall, up to 1.5 m.

Distribution: Occurs in the Baviaanskloof, from Hankey and the Gamtoos River Valley in the E Cape.



Ernst van Jaarsveld



Ernst van Jaarsveld



Ernst van Jaarsveld

1 & 2. ***Gasteria glauca*** (1) in habitat at the lower reaches of the Kouga River, near Guernakop. (2) The flowers of the species.
3. ***Gasteria glomerata*** in habitat on a steep cliff over-looking the Kouga Dam, E of Patensie, E Cape
4 & 5. ***Gasteria nitida*** (4) in habitat E of Hankey, E Cape (5) near the Krakeel River, E Cape
6. ***Gasteria pillansii*** in habitat in the Geigasberg, Richtersveld.
7. ***G. pillansii* var. *hallii*** in habitat in the Oograbies Mountains, Richtersveld
8. ***G. pillansii* var. *ernesti-ruschii*** in habitat in the western Richtersveld National Park.
9. ***Gasteria polita*** in habitat at Whisky Creek, near Plettenberg Bay
10. ***Gasteria pulchra*** in habitat near Hankey, E. Cape



Ernst van Jaarsveld

Ernst van Jaarsveld



Ernst van Jaarsveld



Robin Frandsen



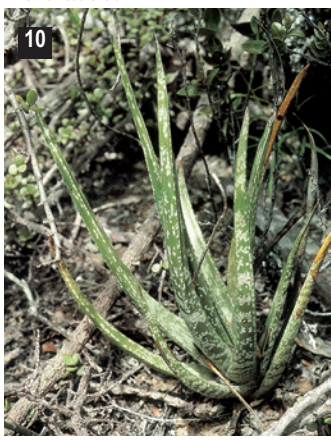
Ernst van Jaarsveld



Ernst van Jaarsveld



Ernst van Jaarsveld



***Gasteria rawlinsonii* Oberm.** This strange species is the only *Gasteria* which has long pendant stems, branching from the base, with leaf-pairs along their entire length, hanging down rock-faces up to and exceeding 1 m. The leaves are distichous or spiraling. The inflorescence is simple and pendant. The flowers are variable in colour.

Distribution: The Baviaanskloof region, SW of Willowmore.

***Gasteria retusa* (Van Jaarsv.) Van Jaarsv.** This species is characterised by and separated from its close relative, the rosulate *G. carinata* by its distinctly undulating, distichous and lorate leaves, which are truncate or notched at the apices. The leaf-surface is distinctly tuberculate. The inflorescence is simple, occasionally branched.

Distribution: Occurs on the N side of the Breede River Valley, between Worcester and Robertson in the W Cape.

***Gasteria thunbergii* N.E. Br.** This is a mat-forming species with strongly channelled, subulate leaves. The attractive leaves are tuberculate with the tubercles arrange d in transverse bands. It is stoloniferous and branches prolifically at the base.

Distribution: From Herbertsdale to the Gamtoos River

***Gasteria tukhelensis* Van Jaarsv.** This is a large, cliff-dwelling stemless species with canaliculate, somewhat falcate leaves with excentric keels, up to 40 cm tall. Leaves are shiny, dark green to reddish, smooth with raised whitish tubercles. The flowers are basally pink with green tips.

Distribution: Recorded only from the Tugela Valley near the confluence of the Buffalo and Tugela Rivers.

***Gasteria vlokii* Van Jaarsv.** This is a small solitary, or small-clustering, rosulate species, up to 40 mm tall. The leaves are recurving and triangular. The leaves have excentric keels, are rough, and densely tuberculate. The simple or branched inflorescence is disproportionately large for the small plant and the flowers are reddish-pink.

Distribution: Restricted to the Groot Swartberg Mountains, N of Oudtshoorn.

Haworthia Duval

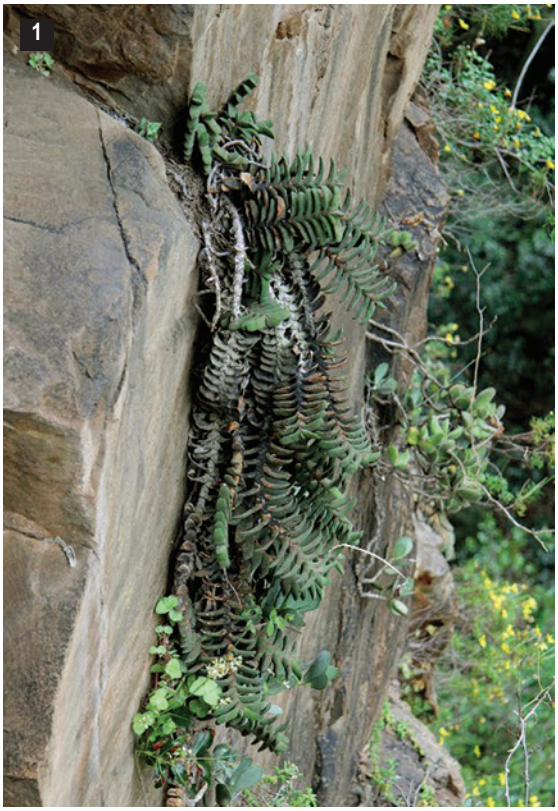
The genera *Haworthia Haworthiopsis* & *Tulista* are arguably the most taxonomically challenging of the southern African succulent genera. Their classifications are mired in much controversy and it would appear that there seems that there are no clear solutions. Many of the species, and recognised varieties are so bewilderingly diverse in appearance, that plants recorded as being of the same taxon are often so dramatically different as to defy simple identification. If the controversial process of classification through cladograms were to be attempted, then the results would be an impossible jungle. The Linnaean classification regrettably does not seem to work very well and to attempt to allocate subgenera and varietal status to many of the species has resulted in a somewhat chaotic situation where little has really been satisfactorily classified or understood.

Nevertheless, on reflection, I have decided that this work will have to rely upon the latest concept submissions of Bruce Bayer, one of South Africa's leading authorities on the group. He has allocated the names to the various taxa, upon which he and John Manning have decided upon as being the most probable classifications of this problematic genus.

Unlike many of the other plants described in this work, where morphological differences generally work in the classification and identification of the plants, this group is so complex that it is beyond the scope of the work to attempt its unraveling. As descriptive detail has been of little use for identification and the bases for his allocation of the taxa,

Examples of abberant colour forms and markings of *Haworthis* species so prized by collectors and enthusiasts *Photos kindly supplied by Mr Hyashi Kobayashi*





Kuba Jilemicky



Kuba Jilemicky



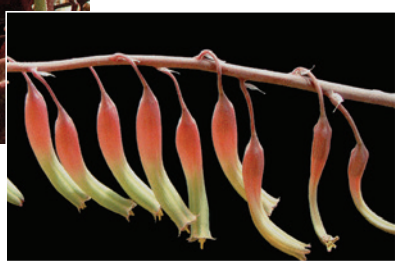
Ernst van Jaarsveld

Robin Frandsen





Ernst van Jaarsveld



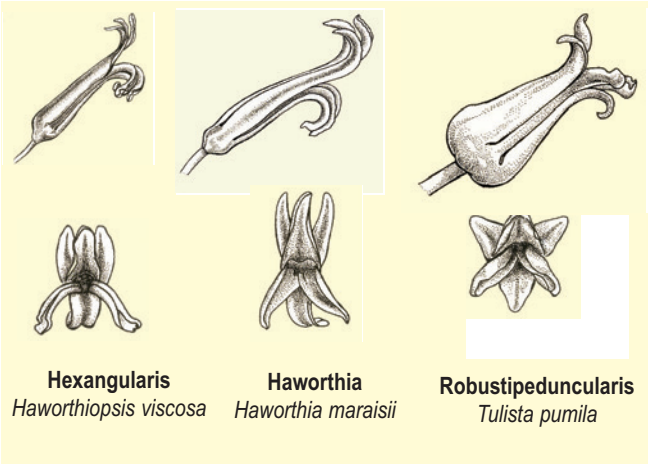
Kuba Jilemicky



Kuba jilemicky



1 & 2. ***Gasteria rawlinsonii*** (1) in habitat at Gert Smitskloof, near Studis, Baviaanskloof E Cape. Branches are in excess of 1m in length
(2) In cultivation in Johannesburg, showing the spiral growth form
3. ***Gasteria retusa*** in habitat at the Nonna River, NE of Worcester
4. ***Gasteria thunbergii*** in habitat near the Gouritz River, E Cape
5. ***Gasteria tukhelensis*** in cultivation from a plant from cliffs above the Tugela River near the confluence with the Buffalo River. Inset the inflorescence
6 & 7. ***Gasteria vlokii*** (6) in habitat at Grootkloof, Swartberg Mountains
(7) In habitat at Scholtzkloof in the Swartberg Mountains



Examples of flower-shapes from the three subgenera of the genera in this section

and particularly for the varieties, I have been obliged to rely mainly on the many exciting and lavish illustrations which portray a very large cross-section of the plants to give some degree of direction as to the allocations of names by Mr Bayer and Mr Manning The inflorescences are fairly similar and are therefore generally not useful for diagnostic purposes.

Of particular interest to some collectors are the aberrant chimerae characteristics which are very evident in some species, notably *Haworthia picta* (and also in some gasterias). Great collection importance is placed on these exaggerated and unusual markings and colour and quite an industry has sprung up, fetching high prices on the collectors' market. (*See pictures on P. 70*).

Sub-genus *Haworthia*

***Haworthia angustifolia* Haw.** This stemless species is proliferous, up to 10 cm tall, with slender, darkish-green to brown to purplish leaves with finely denticulate brownish to dark green margins. Three varieties are recognised: var. *altissima,* var. *baylissii* and var. *pauciflora*. In var. *altissima* the leaves tend to be greyish green and taller. The variety *baylissii* has broader leaves which are somewhat recurved and are flatter. The variety *paucifolia* is not proliferous and has outwardly-flexed leaves, is smaller, with the body of the plant tending to be drawn into the soil.

Distribution: N of Port Elizabeth, across Grahamstown, northwards to Kingwilliamstown and across to East London. With the varieties somewhat admixed across the range.

***Haworthia arachnoidea* L. Duval** This species is solitary, but sometimes forms small clusters. The dense rosettes are up to 100 mm in diameter. The leaves are generally incurved and strongly keeled with long hairy processes along the margins and keel. The leaves are generally a darkish green but may be lighter green. The inner face has several longitudinal stripes and the outside has raised translucent bristle-tipped papillae. The variety *aranea* is uniform green with dense soft hairs and and is smaller—up to 60 mm in diameter. The lighter coloured, pale green variety *namaquensis* is also smaller, up to 60 mm in diameter. The spination is less dense and the plant tends to be more drawn into the soil. The var. *nigricans* is distinguished by its purplish green to purplish colour. The leaves are broader and the spination larger, less dense and is sometimes absent. The var. *scabrispina* has hard, stiff spines and the plants form rounded somewhat rigid rosettes. The variety *setata* has dense white spines which do not blacken with drying and is softer than those of var. *scabrispina*.

Distribution: *Haworthia arachnoidea* occurs in the Worcester region. *The variety aranea* occurs from Ladismith through



Haworthia arachnoidea* var. *arachnoidea Above: in habitat near Eilandia farm, NW of Robertson. Below: in habitat at Bellevue in the Robertson Karoo
Photos Kuba Jilemicky





Kobus Venter

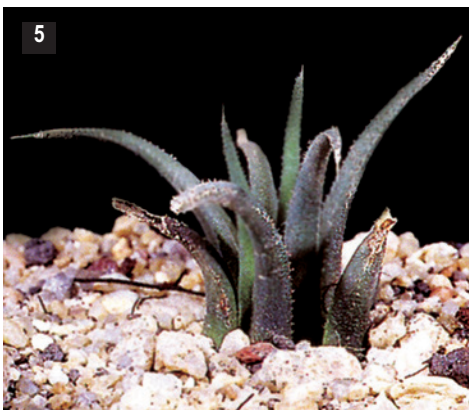


Kuba Jilemicky



Kobus Venter

1 & 2. ***Haworthia angustifolia*** (1) a plant from Coombs, E of Grahamstown (2) In habitat near Grahamstown
3. ***H. angustifolia*** **var. *altissima*** in habitat at Riebeek East
4. ***H. angustifolia*** **var. *baylissii*** from a plant from Oudekraal, E Zuurberg Mts
5. ***H. angustifolia*** **var. *paucifolia*** from a plant from Kaffirdrift NW of Port Alfred in the E Cape
6. ***Haworthia arachnoidea*** **var. *aranea*** in habitat at Matjiesdrif, W of Uniondale
7. ***H. arachnoidea*** **var. *namaquensis*** in habitat in the Oograbies Mountains W of Port Nolloth
8. ***H. arachnoidea*** **var. *nigricans*** in habitat. Note the extreme variability within this group.
9. ***H. arachnoidea*** **var. *setata'*** in habitat at Cogmanskloof, near Montagu.
10. ***H. arachnoidea*** **var. *scabrispina*** in habitat at Koup Station, W of Laingsburg.



Kobus Venter



Kuba Jilemicky

Judd Kirkel Welwitch





Kuba Jilemicky

Kuba Jilemicky



Kuba Jilemicky

Kuba Jilemicky



Oudtshoorn to the Springbokvlakte, in the Steytlerville district. The variety *namaquensis* occurs from the Orange River in the Richtersveld, southwards to Sutherland. The variety *nigricans* occurs in the Little Karoo from Montagu through Ladismith to near Oudtshoorn. The variety *scabrispina* from N of Montagu, through Laingsburg, to Sutherland and E to Merweville. The variety *setata* occurs across the Little Karoo.

Haworthia aristata **Haw.** This is a variable solitary species with rosettes about 5 cm in diameter. The pale green sometimes translucent leaves are erect, incurved with strong keels. The margins and keels have short to long whitish spines and are striped with darker green to purplish lines. The apices of the leaves are tipped with an awn.

Distribution: Occurs in an arch around Port Elizabeth.

Haworthia bayeri **J.D. Venter & S.A. Hammer** This attractive retused-leaved species is much favoured for its ability to produce spectacular colour variation on its leaves. It is stemless with rosettes about 5 cm in diameter, with dark brownish-green to blackish-green with longitudinal leaf vein striping or fine reticulations with the upper surface cloudy-transparent. The surface is slightly scabrid.



Bruce Bayer

Kuba Jilemicky



Haworthia bayeri
Left: in habitat S of Oudtshoorn.
Below: In habitat near De Rust, NE Little Karoo

Distribution: Occurs in the Little Karoo, in the W in the Rooinek Pass, S of Laingsburg and eastwards through the Oudtshoorn/De Rust region to Willowmore in the E.

Haworthia blackburniae **W.F. Barker** This species is characterised by its long slender canaliculate leaves about 4 cm tall, but sometimes short and squat, with a tendency to flex downwards and sideways. It has 2 additional varieties: var. *derustensis* which is much more robust, with the leaves more channeled with a brownish tinge. In var. *graminifolia* the leaves are more channeled and slender and is armed with minute white teeth along the leaf margins.

Distribution: Montagu/Ladismith in the Little Karoo. The variety *derustensis*: near De Rust in the Little Karoo. The variety *graminifolia* near Schoemanspoort, Oudtshoorn and Ladismith.

Haworthia bobii **M. Hyashi** Identification is unmistakable. The upper leaf surface is covered with 'hairy' spinose tubercles. The rosette, leaf shape and the dark bluish-green colour links this species with *H. mirabilis* var. *badia*. When exposed to direct sunshine the leaves turn an attractive red-brown. In habitat they shelter under coastal fynbos. It flowers in summer. Originally this species was known as *H. mirabilis* var. *pilosa.*

Distribution: Known from a single localised location near the coast along the Breede River.

Haworthia bolusii **Baker** This species forms clumps of several plants. The rosettes of this hairy species are up to 15 cm in diameter, the keeled leaves are inwardly curved with the edges of the lobes with long whitish cilia. The leaves are a translucent bluish-green. There are two additional varieties: *blackbeardiana* which is generally larger than the typical variety; and *pringlei* which is closer to *H. decipiens* in characteristics.

Kuba Jilemicky





Kobus Venter



Kobus Venter



Kobus Venter



Kuba Jilemicky



Kuba Jilemicky

1 & 2. ***Haworthia aristata*** (1) in cultivation from a plant from Hopewell in the N Zuurberg Mountains (2). from a plant from Kaboega in the Zuurberg Mountains
3. ***Haworthia blackburniae*** in habitat at Kruisrivier, W of Oudtshoorn
4. ***H. blackburniae* var. *derustensis*** in habitat near Dysseldorp, W of Oudtshoorn
5. ***blackburniae* var. *graminifolia*** in habitat at Schoemanspoort N of Oudtshoorn
6 - 7. ***Haworthia bobii*** in habitat at the Breede River, SW Cape
8. ***Haworthia bolusii*** in habitat just W of Graaff-Reinet
9. ***Haworthia bolusii*** in habitat
10. ***H. bolusii* var. *blackbeardiana*** in habitat at Heatherton, E Cape
11. ***H. bolusii* var. *pringlei*** in cultivation from a plant from S of Eastpoort & W of Bedford E Cape



Kobus Venter



Kuba Jilemicky

Kuba Jilemicky





Kuba Jilemicky



Distribution: Occurs from Middelburg in the N to Cradock in the S and SW to Jansenville. var. *blackbeardiana* occurs from S of Cathcart and westerly to near Jansenville. var. *pringlei* occurs SW of Adelaide in the E Cape.

***HAWORTHIA BREUERI* M. Hyashi** This is a medium-size, solitary species with greyish-green leaves which are thick with a short awn at the leaf ends. The surface is scabrid with whitish translucent dots.

Distribution: Occurs on low hill slopesin the S Little Karoo, from Springfontein, westwards towards Garcia Pass.

***HAWORTHIA CHLORACANTHA* Haw.** This fairly localised species has rosettes of up to 35 mm in diameter. It branches readily and prolifically and the stemless rosettes have semi-erect yellowish to green leaves which are spinescent on the edges and keels. The variety *denticulifera* is dark purplish-green with small teeth and is smaller. The var. *subglauca* is more robust with waxy leaves. The spines are sparser and less numerous. The variety *denticulifera* is dark green in colour.

Distribution: Var *chlorantha occurs* around Herbertsdale and var. *denticulifera* occurs along the lower reaches of the Gouritz. The variety *subglauca* occurs near the coast around Mossel Bay. The variety *denticulifera* occurs around the Little Brak, Mossel Bay through Herbertsdale, Riversdale and Bredasdorp. Var. *robusta* occurs near Mossel Bay

Haworthia breueri in habitat at Kareekloof, S Little Karoo, SW Cape
Photo Kuba Jilemicky



***HAWORTHIA COOPERI* Baker** A very variable common species with many named varieties. The typical species forms rosettes of up to 20 cm in diameter. Usually very proliferous it has fleshy, oblong-lanceolate leaves which are translucent and end in an apical awn. The colour is bluish-green and slightly translucent, usually with obscure reddish veins. The variety *dielsiana* has much-rounded leaf apices. The variety *gordoniana* is small, with the incurved leaves usually sparsely spined, with the tips not truncate. The variety *gracilis* is proliferous with the grey green leaves incurved with short slender marginal spines. The upper surface is translucent between the lines. The variety *isabellae* differs in the more spreading outer and more erect inner leaves. The marginal spines are dense and relatively longer. The variety *leightonii* does not have truncated leaves and is very proliferous. The variety *pilifera* has no marginal cilia. The attractively veined leaf apices are

Haworthia chloracantha Top: in habitat N of Herbertsdale, S Little Karoo *Photo Kuba Jilemicky.*
H. chloracantha* var. *denticulifera Below left in cultivation from a plant near Herbertsdale *Photos Bruce Bayer*
H. chloracantha* var. *subglauca Below right near the Hartebeeskuil Dam on the Hartenbos River near Mossel Bay *Photo Kobus Venter*









Kuba Jilemicky



Kuba Jilemicky



Bruce Bayer

Judd Kirkel Welwitch



1 & 2. ***Haworthia cooperi*** (1) in habitat SW of Uniondale, S Cape. (2) in habitat W of Uniondale
3. ***Haworthia cooperi* var. *dielsiana*** in habitat at Eastpoort. W of Bedford
4. ***H. cooperi* var. *doldii*** from Chalumna.
5. ***H. cooperi* var. *gordoniana*** from N Uniondale.
6. ***H. cooperi* var. *gracilis*** in habitat NE of Grahamstown
7. ***H. cooperi* var. *isabellae*** from Rooikloof, Baviaanskloof.
8. ***H. cooperi* var. *leightonii*** from Kayser's Beach, SW of East London
9. ***H. cooperi* var. *pilifera*** from Chancery Hall, SW of Adelaide.
10. ***H. cooperi* var. *puberula*** from Klipfontein, Kaboega.
11. ***H. cooperi* var. *tenera*** from Pluto's Vale, NE of Grahamstown.
12. ***H. cooperi* var. *truncata*** from Pluto's Vale, NE of Grahamstown
13 & 14. ***H. cooperi* var. *venusta*** (13) in cultivation from S of Grahamstown. (14) in habitat from N of Kenton on Sea
15. ***H. cooperi* var. *viridis*** Perdepoort, NE of Kleinpoort, E Cape

Bruce Bayer



Bruce Bayer



Kobus Venter



Kobus Venter



Bruce Bayer



Bruce Bayer



Bruce Bayer



Bruce Bayer



Kuba Jilemicky



Kuba Jilemicky



obtusely acuminate with a pronounced awn. It is usually well-retracted in the ground and the colour is usually purplish with pinkish and brownish tones. The variety *puberula* is very similar to *H. gordoniana*. The margins and keels have long whitish soft cilia. The colour is usually greenish to reddish-purple. Leaves are erect, incurved and prominently veined. The variety *minima* is very variable, from being almost spineless to the most typical species from Plutovale, which is heavily spined on the margins and the keel. Colour is green to greyish-green. The variety *viridis* is bright green in colour, with the leaves erect, sub-erect and incurved; without spines or very sparse spines on the keel and margins.

Distribution: Occurring from the high-lying ground of the Zuurberg to the valley bushveld of the Fish River. The nominate plants are found between Cradock, southwards to Bedford and eastwards to near Cathcart. The variety *gordoniana* in the Hankey/Patensie area. The variety *leightonii* NE of Hamburg, around Kaysers Beach in the eastern Cape. The variety *gracilis* Bedford, S to E of Riebeek-Oos to E of Steytlerville. The variety *isabellae* near Joubertina and eastwards to Van Stadens River; The variety *pilifera* is distributed around Kingwilliamstown and Grahamstown. The variety *puberula* in the region of Kaboega, S of the Winterhoek Mountains near Addo. The variety *viridis* occurs in the Winterhoek Mountains, N and NW of Glenconnor.

Haworthia cummingii **Breuer & Hyashi** This species has pale, greyish-green erect leaves, incurved at the tips, with toothed-margins and -keels. Its growth to maturity is solitary and then ramifying into large dichotomous branches. It occurs in the shade of *Euphorbia coarulescens* and is known to hybridise with *H. cymbiformis.*

Distribution: Found east of Committees Drift along the Fish River in the E Cape.

Haworthia cymbiformis **(Haw.) Duval** This incredibly variable and widespread, generally very proli-ferous species, has many varieties. This glabrous plant has rosettes about 9 cm in diameter with usually opaque, green leaves which turn yellowish to pinkish on exposure. The typical var. *cymbiformis* comprises the main body of the groupings. The variety *incurvula* has incurved, narrowish leaves. The variety *obtusa* has blunt-tipped leaves. The variety *ramosa* is a branched, stemmed form. The leaves of The variety *setulifera* are quite spined and more triangular in shape.

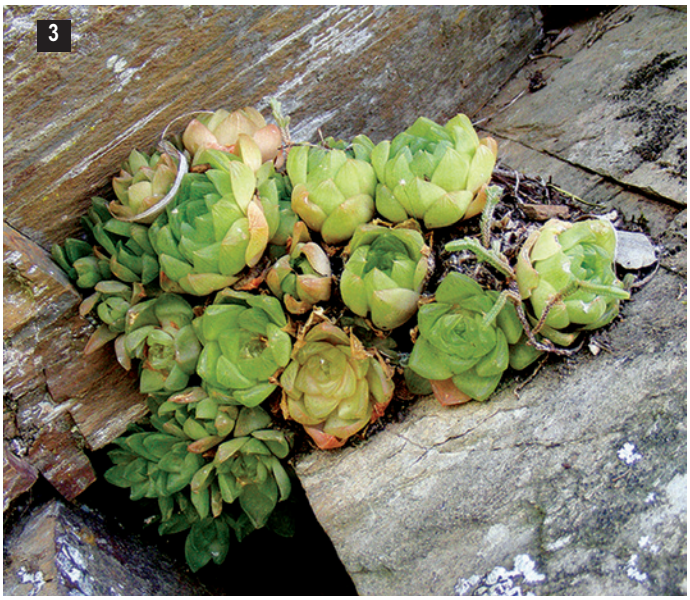
Distribution: This species occurs from N of Port Elizabeth northwards to Fort Beaufort across to near Stutterheim and southwards to East London, with an outlier of the var. *obtusa* occurring near Mquanduli, near Mthatha in the former Transkei. The varieties are somewhat admixed in their range.

Haworthia decipiens **V. Poelln.** This stemless species proliferates slowly. The bright green leaves are broadly ovate, sometimes acuminate with long, heavy marginal and keel spines; with darker green to purplish venation. The variety *cyanea* is smaller with incurved veins and bluish-green leaves. The variety *minor* is even smaller with broad incurved bright green leaves. The variety *xiphiophylla* is a bright green form with short, well-spaced teeth on the leaves which are not translucent.

Distribution: Widespread species with var. *decipiens* occurring from Merweville in the W across to N of Glen Connor, near Port Elizabeth in the E. The variety *cyanea* occurs NW of Merweville across to E of Steytlerville. The variety *minor* is more localised N and NE of Port Elizabeth and var. *xiphiophylla* near Steytlerville and around Port Elizabeth.


1


2



Bruce Bayer



Kobus Venter



Kobus Venter

Kobus Venter



1 & 2. ***Haworthia cummingii*** in habitat E of Committees Drift,
3. ***Haworthia cymbiformis*** in habitat at the Sundays River E of Port Elizabeth
4. ***Haworthia cymbiformis* var. *incurvula*** from Plutosvale
5 ***H. cymbiformis* var. *ramosa*** from Wooldridge, SW of East London.
6. ***H. cymbiformis* var. *obtusa'*** from Blaaukranz, SE of Grahamstown
7. ***H. cymbiformis* var. *setulifera*** from NE of East London
8 ***Haworthia decipiens*** in habitat S of Steytlerville.
9. ***H. decipiens* var. *cyanea*** in habitat at Gwarriepoort, SW of Steytlerville.
10. ***H. decipiens* var. *minor*** NW Grootpoort, W of Willowmore
11. ***H. decipiens* var. *virella*** in habitat at Campferspoort N of Steytlerville
12. ***H. decipiens* var. *xiphiophylla i***n habitat at Coegakop

Kuba Jilemicky



Kobus Venter



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



***Haworthia esterhuizenii* M. Hyashi** This species is often confused with and distributed as *H. splendens.* The plants are however smaller, with scabrid leaf surfaces and is without the characteristic glossy appearance of that species.

Distribution: *H. esterhuizenii* is known from one area E of Albertinia and is found close to *H. vincentii*.

***Haworthia floribunda* V. Poelln.** A distinctive species which is slowly proliferous. The rare typical variety is glabrous, dark green, opaque with twisted, lanceolate leaves with blunt tips. The variety *dentata* is a smaller dark green, slightly scabrid plant with distinct and widely spaced leaf margin spines. The variety *major*, as the name implies, is a large robust form which is darker in colour and slightly scabrid.

Distribution: The typical variety occurs from Riversdale in the E to Swellendam in the W.. The variety *dentata* occurs from Riversdale in the W to the Gouritz River in the E. The variety *major* in several localities around Swellendam.

***Haworthia groenewaldii* Breuer** This very attractive species is a small species with characteristic consistently rounded leaf-tips. The new leaves are produced at a twisted angle at the tips. The leaf surfaces have a few lines but some plants develop dense white flecking and cloud-like markings. It is closest to *H. mirabilis* var. *badia.*

Distribution: It occurs near the Buffelsjacht River in the Swellendam area.

***Haworthia herbacea* (Mill.) Stearn** This is a proliferous stemless species with erect, recurved reticulate-patterned translucent leaves which are scabrid with margins and keel armed with firm teeth. The variety *flaccida* is very variable and differs from the typical variety in being small and delicate. They often form dense clusters. The variety *lupula* is distinctive in its large pink flowers, broader and shorter leaves which are less scabrid and more finely flecked. The variety *paynei* is a small form with bi-coloured flowers.

Distribution: The species is concentrated in a small area in the Robertson and Little Karoo. The typical variety is found throughout this region. The variety *flaccia* occurs on the N facing slopes of the Rooiberg W of Robertson. The variety



Haworthia herbacea in habitat at Sandberg, NW of Baardskeerdersbos, SW Cape *Photo Kuba Jilemicky*

lupula occurs near Villiersdorp and S of McGregor S of Robertson. The variety *paynei* is found near Villiersdorp.

***Haworthia joleneae* M. Hyashi** This attractive species is similar in shape to *H. bobii* but the leaves are totally glabrous. It is larger and and more variable in colour. Some leaves may have attractive black lines and are very dark in colour. The rosette, leaf-shape, and darkish bluish-green colour links it with *H. mirbilis* var. *badia*.

Kuba Jilemicky



Kuba Jilemicky





Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kobus Venter



Kuba Jilemicky



Kuba Jilemicky

Kuba Jilemicky



1 & 2. ***Haworthia esterhuizenii*** in habitat E of Albertinia
3. ***Haworthia floribunda*** in habitat in the Overberg, W Cape
4. ***H. floribunda* var. *dentata*** from NW Potberg, SW Cape
5. ***H. floribunda* var. *major*** in habitat, near Swellendam
6 & 7. ***Haworthia groenewaldii*** in habitat at Buffelsjucht River, E of Swellendam
8. ***Haworthia herbacea* var. *paynei*** in habitat at McGregor in the SW Cape
9. ***Haworthia herbacea* var. *lupula*** in habitat near Villiersdorp,
10. ***H. herbacea* var. *flaccida*** from Rooiberg in the SW Cape
11 & 12. ***Haworthia Joleneae*** in habitat between Potberg & the Breede River

Distribution: Known from several localities between Potberg and the Breede River.

HAWORTHIA LOCKWOODII **Archibald** This interesting and distinctive species is slowly proliferous and somewhat drawn into the soil. In the growing season the flat, broad leaves are bright green with slightly darker veining and no marginal teeth, with the upper half dying back. In winter the dead tips nearly cover the plant.

Distribution: Occurs S of Matjiesfontein in the valley behind the Witteberg. It also occurs SE of the Rooinek Pass.

HAWORTHIA MACULATA **(V. Poelln.) M.B. Bayer** This proliferous species ranges in colour from usually deep purple through red-yellow to green. The leaves are spotted with largish translucent spots and have short spines on the margins and keels.

Distribution: NE of the Brandvlei Dam near Worcester with an outlier population nr Audensburg, N of Worcester.

HAWORTHIA MARUMIANA **Uitewaal** A very proliferous and widespread species which has sub-erect leaves with the margins having softish spines. The some-what translucent leaves are purplish-green and have reticulate patterning. The variety *archeri* is small and brownish green in colour, very similar to the typical variety except for its floral difference, its less markings on slightly incurved leaves and its distribution. The variety *batesiana* is smooth, bright green with a light reticulate patterning. The variety *reddii* was formerly regarded as a form of *H. cymbiformis*. It is very proliferous, some plants are opaque others have distinct translucent spots and lines. The variety *dimorpha* is larger with outflexed, much fewer leaves and has a block patterning on the seeds, not found in the other forms but encountered in *H. pulchella*, close to which it occurs. The variety *viridis* is light green with narrower, more erect leaves.

Distribution: The typical variety ranges from Merweville in the SW to Middelburg in the N and across to Somerset East and Fort Beaufort in the E. var. *archeri* ranges from Merweville in the E to N of Montagu in the Little Karoo and across to near the Gamkapoort Dam. The variety *batesiana* occurs in several areas around Graaff-Reinet. The variety *dimorpha* occurs near Konstabel station, W of Matjiesfontein, and var. *reddii* is found between Fort Beaufort and Kingwilliamstown in the eastern Cape. The variety *viridis* is found between Ladismith and Prince Albert.

HAWORTHIA MARXII **S.D. Gildenhuys** This is an extremely rare and localised species which superficially resembles *H. bayeri* and to some extent *H. picta*. However morphological differences make this a good species. An important difference is the rather flat shape of the rosette when viewed from the side. This is a difficult species to cultivate.

Haworthia maculata (top) in habitat at Die Nekkies, E of the Brandvlei Dam, W Cape (middle) a plant from nr Audensberg, N of Worcester *Photo Kobus Venter*
H. maculata* ar. *livida (bottom) in habitat at Lemoenpoort, S of the Brandvlei Dam *Photo Kuba Jilemicky*



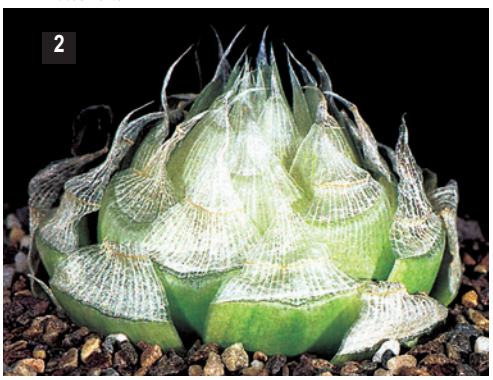






Robin Frandsen

Kobus Venter



Sean Gildenhuys





Kuba Jilemicky

1 & 2. ***Haworthia lockwoodii*** (1) in habitat, S of Matjiesfontein (2) In habitat from SE of Laingsburg
3. ***Haworthis marumiana*** fromE of Murraysburg, N Cape
4. ***H. marumiana* var. *archeri*** in habitat at Josefskraal, near Matjiesfontein
5. ***H. marumiana* var. *dimorpha*** in habitat near Konstable Station, W of Matjiesfontein
6. ***H. marumiana* var. *batesiana*** a plant from Kamdebooberg, near Graaff-Reinet.
7. ***H. marumiana* var. *reddii*** a plant from Inversomo, W of Butterworth
8. ***H. marumiana* var. *viridis*** plant from Kweekvlei, S of Prince Albert
9 & 10.***Haworthia marxii*** in habitat on the Rooinek Pass.

Judd Kirkel Welwitch





Bruce Bayer



Kuba Jilemicky



Kobus Venter

Kobus Venter



Kuba Jilemicky



Distribution: Limited to southern slopes of the Rooiberg Pass, W of Ladismith, Little Karoo.

HAWORTHIA MIRABILIS **Haw.** This is a widespread species with many varieties. It is a stemless, generally proliferous species with markedly retused, acute leaves usually with a translucent face and generally with spines on the margins. All forms are attractive plants and desirable in collections. The typical variety is as described above with the accepted varieties deviating as described below in their descriptions. The variety *atrofusca* is a large brownish-green to blackish form, densely tubercled and scarcely translucent. The variety *badia* is robust, slowly proliferous with quite attenuate leaves, developing into a deep shiny brown in the sun. The variety *beukmanii* is a beautiful robust form with strongly retused leaves. The variety *consanguinea* is a small proliferous soft-leaved form with brownish-red leaves. The variety *heidelbergensis* is a proliferous form with many erect to recurved retused leaves, usually dark green with reddish hues. The ends of the leaves are slightly translucent. The variety *maraisii* has very dark green, opaque, scabrid leaves, which are occasionally spined on the margins and keels. The variety *maraisii* is a robust form with the leaves rather scabrid, which bear short spines and are finely denticulate on the margins. Their colour is generally darkish green to purplish-green to yellowish-brown. The variable var. *meiringii* has erect leaves which are light, but generally dark green, tinged with purple. The variety *notabilis* has erect light to dark green turgid leaves. The proliferous var. *paradoxa* is an attractive brownish- to dark green with retused sharply-pointed leaves with spines on the margins, keels and leaf-faces. The variety *scabra* is a common small dark green form. Leaves are scabrous especially along the margins and keels. The variety *splendens*, is a beautiful form. It is well-named and it is highly sought after in collections, being very variable in its surface markings and colours of the retused surfaces of the leaves and, as the leaf surfaces may also have unusual markings, it is assiduously interbred with others by some growers to enhance the unusual characters to produce cultivars which may fetch high prices. The variety *sublineata* typically has long slender sub-erect light brown to greenish leaves with well-developed margins and keel spines. The variety *toonensis* has recurved leaves with distinctly translucent apices. Some plants have rough surfaces to their leaves. The variety *triebneriana* is a large proliferous plant, with green to brownish leaves with scabrid outer surfaces and smooth inner surfaces. The retused apices are transparent with prominent lighter lines.



Haworthia mirabilis Above: in habitat at Mierkraal near Napier. *Photo Kuba Jilemicky*
Below: in habitat at Oudekraalkop, SW of Heidelberg *Photo Bruce Bayer*



Haworthia mirabilis* var. *atrofusca In habitat at Kweekkraal, nr Napier, SW Cape *Photo Kuba Jilemicky*





Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky

Kuba Jilemicky

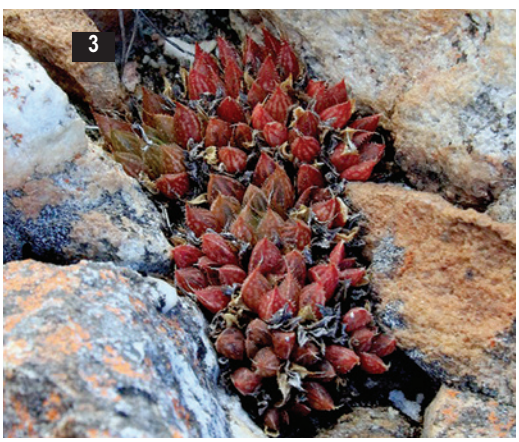


Kuba Jilemicky



Bruce Bayer





Kuba Jilemicky

1. ***Haworthia mirabilis var. badia*** in habitat W of Napier
2. ***Haworthia mirabilis*** **var. *beukmanii*** in habitat at Skuitsberg, SW Cape
3. ***H. mirabilis*** **var. *consanguinea*** in habita at Die Galg, N of Riviersonderend in the SW Cape
4. ***H. mirabilis*** **var. *heidelbergensis*** in habitat at Die Plotte, near Heidelberg
5 & 6. ***H. mirabilis*** **var. *maraisii*** (5) in habitat at Olifantsdoorn, N of Riviersonderend, (6) in habitat at Bontebok NP
7. ***H. mirabilis*** **var. *meiringii*** in habitat at Goudmyn, S of Ashton, SW Cape
8. ***H. mirabilis*** **var. *notabilis*** in habitat at Sandberg, SE of Robertson, SW Cape
9. ***H. mirabilis*** **var. *paradoxa*** in habitat at Koensrus near the coast,S of Heidelberg, SW Cape
10. ***H. mirabilis*** **var. *scabra*** in habitat at Middelrivier, W of Swellendam, SW Cape
11. ***H. mirabilis*** **var. *splendens*** in habitat W of Albertinia, SW Cape



Kuba Jilemicky

Kuba Jilemicky



Kuba Jilemicky



Robin Frandsen



Distribution: The typical variety is common in the Robertson Karoo from S of Worcester, through Montagu southwards to near Infanta in the Overberg. The variety *atrofusca* is confined to small populations to the W and N of Riversdale and a small population near Potberg, W of the Breede River in the Overberg. The variety *beukmannii* occurs at Skuitsberg, near Caledon. The variety *consanguinea* is a montane form from Die Galg, NW of Caledon The variety *heidelbergensis* occurs in and around western Heidelberg. The variety *maraisii* is a fairly widespread form from S of Worcester southwards to Napier and into the Potberg Reserve near the south coast. The variety *meiringii* occurs from E of Bonnievale across to the W of the town. The variety *notabilis* occurs at Wolfkloof a few kilometres NW of Swellendam on the S side of the Marloth reserve. The variety *paradoxa* occurs at Vermaaklikheid, SW of Riversdale near the coast. The variety *scabra* occurs from W of Bonnievale, southwards to the Potberg Reserve near the coast. The variety *splendens* occurs E and W of Albertinia. The variety *sublineata* occurs from N and S of Bredasdorp The variety *toonensis* occurs at Matjestoon, near Bredasdorp. The variety *triebneriana* occurs SW of Swellendam, across to S of Greyton to N of Napier.

HAWORTHIA MONTICOLA **Fourc.** This stemless, proliferous species has elongated, keeled lanceolate leaves with small spines on margins and keels. The typical variety has blackish, through reddish-purple to green mottling on the surface of the leaves. The smoother, turgid var. *asema* is more uniformly grey-green. It flowers much earlier than the typical variety.

Distribution: The typical variety occurs from S of Oudtshoorn, to Klaarstroom, N of the Meiringspoort Pass in the Swart-berg, across to Steytlerville and Uniondale. The variety *asema* occurs S of the Swartberg, NE of Calitzdorp.

H. mirabilis* var. *splendens in habitat 20 km W of Albertinia
photo Bruce Bayer









Top ***H. mirabilis* var. *sublineata*** in habitat S of Bredasdorp, SW Cape
Centre ***H. mirabilis* var. *toonensis*** in habitat SW of Heidelberg, SW Cape
Centre ***H. mirabilis* var. triebneri** in habitat at Oakdene, SW Cape
Photos Kuba Jilemicky

HAWORTHIA MUCRONATA **Haw.** This very variable species, even within specimens from the same variety, is a stemless, proliferous species with soft, incurved, broadly ovate-lanceolate leaves. The leaves are pale green to dark purple, slightly pellucid and the margins and keels are translucent with very short to longish soft spines. The apices may be blunt to sharpish, opaque to translucent with short apical lines. The variety *habdomadis* has shorter and broader



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky

1. ***Haworthia monticola*** in habitat at Williamsburg
2. ***H. monticola* var. *asema*** in habitat at Kraaldoorn, N of Calitzdorp, Little Karoo
3 & 4. ***H. monticola* var. *asema*** in habitat at Buffelskloof, N of Van Wyksdorp, Little Karoo
5. ***Haworthia mucronata*** in habitat at Voorbaat, W of Ladismith.
6. ***H. mucronata* var. *habdomadis*** in habitat at the Seweweekspoort, E of Ladismith
7. ***H. mucronata* var. *inconfluens*** a plant from Limerick, near Calitzdorp
8 ***H. mucronata* var. *rycroftiana*** in habitat near the Gouritz River Bridge
9 ***H. mucronata* var. *morrisae*** in habitat at Volmoed, W of Oudtshoorn.



Kuba Jilemicky

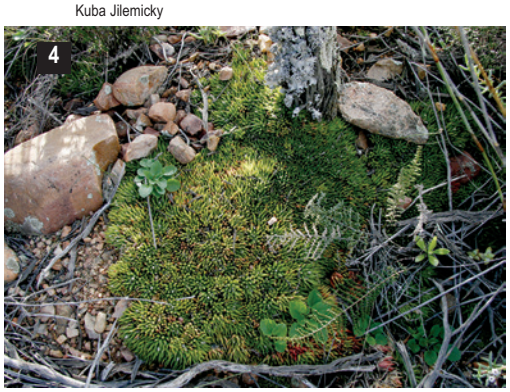


Kuba Jilemicky



Bruce Bayer

Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



leaves, their colour is purplish to green. The variety *inconfluens* has leaves which are paler green and the incurved leaves come together. The variety *morrisiae* is bright, almost emerald green. In summer the leaf-tips or the entire leaf turns deep reddish-brown. The variety *rycroftiana* has smoother and thicker leaves than the typical form.

Distribution: The variety *mucronata* occurs in the Little Karoo from around Barrydale across to N of Oudtshoorn. The variety *habdomadis*: this montane species is found N of Ladismith in the Klein Swartberg, notably in the Seweweekspoort. The variety *inconfluens* occurs across the western and north-central Little Karoo, from N of the Hoekvandenberg range, across to N of Calitzdorp. The variety *morrisiae* is found across the entire Little Karoo from N of Montagu across to the Kammanassie Dam, E of Oudtshoorn. The variety *rycroftiana* occurs in a wide band N of the Langeberge from Vanwyksdorp to Herbertsdale.

Haworthia mutica **Haw.** A stemless species with blunt, strongly-retused, blunt-tipped purplish to pale green leaves. The retused tips are only barely pellucid and have several longitudinal stripes, The typical variety does not appear to proliferate. The var. *nigra*, previously included here has been included under *H. retusa.*

Distribution: This retused species occurs fairly frequently from near Montagu southwards in a broad band across the Overberg to Bredasdorp.

Haworthia mutica in habitat near Napky, S of Swellendam, SW Cape
Photo Kuba Jilemicky



Haworthia nortieri **C.G. Sm.** This is a stemless, proliferous species. The sub-erect, ovate-lanceolate to ovate leaves are many and soft with small teeth on the margins and keels; brownish to purplish-green to pale green in colour with characteristic large translucent spots on the leaves. The variety *albispina* is a beautiful plant with long white spines on the margins and keels. The variety *globosiflora* is a beautiful form with fine spination on the margins and keels of the leaves, which are purplish to bright green. It is well-known for the inflated bulbous base of the perianth of its flowers. The variety *pehlemanniae* is another variety with long spination on the margins and keels. Similar to var. *albispina,* it however lacks the translucent spots. It has globose flowers similar to var. *globosiflora*.

Distribution: The typical variety occurs over a wide area from SE of Citrusdal to SW of Nieuwoudtville and northwards across the Knersvlakte, across to Hondeklipbaai to the Richtersveld. The variety *albispina* is found E of the Dwyka station in the southern Great Karoo. The variety *globosiflora* occurs from W of Nieuwoudtville, S to the Doorn River. The variety *pehlemanniae* occurs N and S of Laingsburg.

Haworthia odetteae **Breuer** This is an attractive dark green, completely opaque species, with a very narrow leaves. The leaf-margins and keels have very fine white hairs. Adult plants divide into clusters. This recently described species was previously believed to be a form of *H. bolusii*.

Distribution: Occurs at several localities E of Jansenville.

Haworthia outeniquensis **M.B Bayer** This is a stemless, very proliferous species with erect light green erect to sub-erect leaves with a long awn and with pellucid dots. The margins and keels have long soft spines.





Bruce Bayer



Bruce Bayer



Bruce Bayer



Kuba Jilemicky



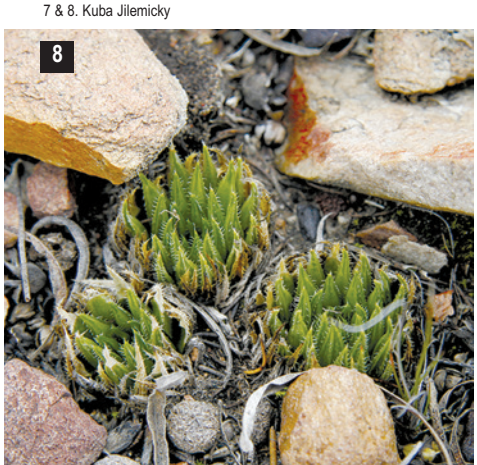
Kuba Jilemicky



Kuba Jilemicky

1 - 3. ***Haworthia nortieri*** (1) in habitat, emerging from hibernation at Nuweplaas near Loeriesfontein.
(2) In habitat at Blinkberg, in the Cedarberg.
(3) A plant from Steenkampsberg, near Vanrynsdorp
4. ***H. nortieri* var. *globosiflora*** a plant from Botterkloof, S of Nieuwoudtville
5. ***H. nortieri* var. *albispina*** in habitat near Koup Station
6. ***H. nortieri* var. *pehlemanniae*** in habitat near Koup Station
7. ***Haworthia outeniquensis*** Below: in habitat at the Moeras River, SW of Oudtshoorn.
8. ***H. outeniquensis* var. *heroldii*** Bottom: in habitat near Herold in the SE Litttle Karoo
9 & 10. ***Haworthia odetteae*** in habitat at Doornfontein, E of Jansenville

7 & 8. Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



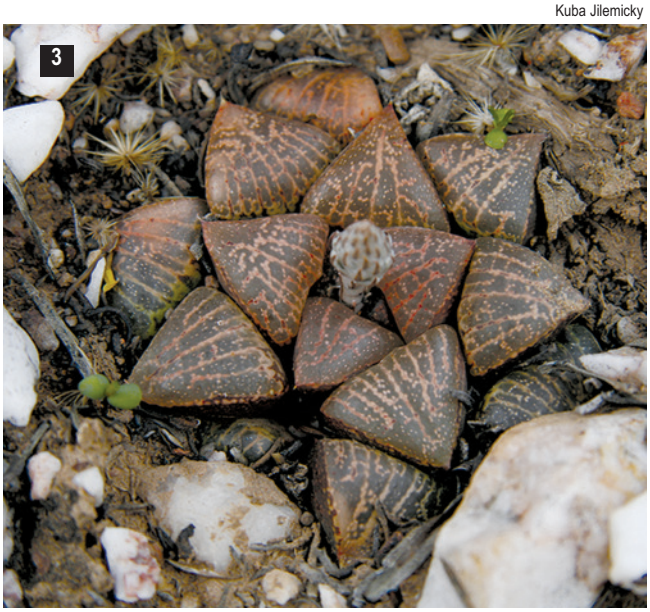
Distribution: Occurs SW of Oudtshoorn in a band across to Herold in the Little Karoo.

HAWORTHIA PARKSIANA **V. Poelln.** This is a small stemless, proliferous species, up to 4 cm in diameter, with sharply recurved blackish to purple leaves and minutely tuberculate. It favours a well-protected habitat in moss, lichen, fallen leaves and karooid bushes.

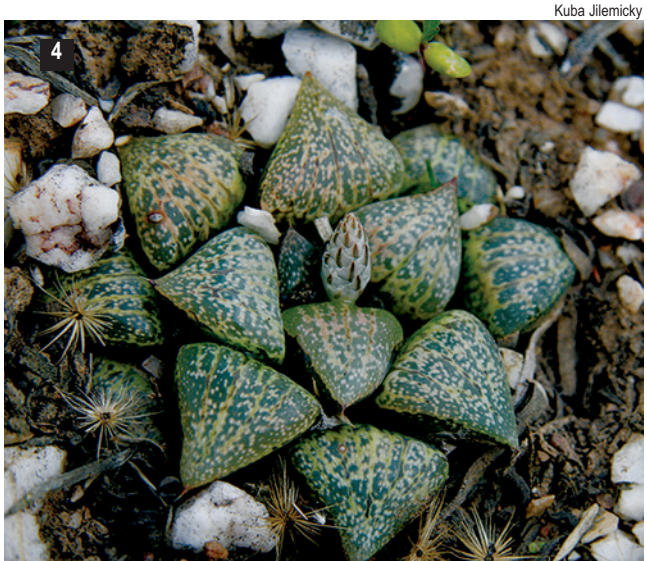
Distribution: This rare tiny plant occurs in three localities: in and near the township of Great Brak, N of Mossel Bay.

HAWORTHIA PICTA **V. Poelln.** This is one of the beautiful retused species which is very variable indeed. Species previously classified under *H. emelyae* are now accepted as being included in this very variable species. It is very rarely proliferous. The pointed leaves are variable in colour from dark purple through greenish to yellowish-brown. They are strongly retused and attractively marked with veins and fine speckles. The variety *comptoniana* is very distinctive and should perhaps have remained a full species in its own right. The translucent retused leaf faces, which are blunt- to sharply-pointed, are beautifully reticulated with prominent veins. The variety *major* is larger, it is shortly, but lightly to heavily, spinescent on the margins, keels and face. The colour is brownish green through to darkish purple. The variety *multifolia* has more leaves than the other varieties and has narrow erect leaves with deltoid marginal teeth. The leaves are translucent with some transparent spots on the back of the leaves with short, translucent veins on the inside.

Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky





Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky

1 & 2. ***Haworthia parksiana*** in habitat at Bottelierskop, N of the mouth of the Klein Brak River , SW Cape
3 & 6. ***H. picta*** (3 & 4) in habitat at Witkliprug, SE of Oudtshoorn, Little Karoo
(5). in habitat at Bewerus, NW of George, SW Cape
(6) in habitat north of the Robinson Pass, Little Karoo
7. ***H. picta* var. *comptoniana*** in habitat at Vaalkranz, near Willowmore
8. ***H. picta* var. *major*** in habitat E of Zandkraal, NW of Garcia Pass, S Little Karoo
9. ***H. picta* var. *major*** in habitat at Muiskraal, E of Garcia Pass, Little Karoo
10. ***H. picta 'tricolor'*** in habitat on the Rooiberg Pass, SW of Calitzdorp
11. ***H. picta* var. *multifolia*** in habitat at Muiskraal, S Little Karoo.

Robin Frandsen



Kuba Jilemicky



Distribution: An attractive species with a somewhat limited distribution across the Little Karoo, with var. *emelyae* occurring from W of Ladysmith across to Willowmore. The variety *comptoniana* is known from one locality near Willowmore and is critically endangered in the wild. The variety *major* is limited to a small area at Muiskraal, near to the Garcia Pass in the Langeberge and var. *multifolia* along the N edge of the Langeberge near to Springfontein, W of the Garcia Pass.

HAWORTHIA PUBESCENS **M.B Bayer** This is a solitary species, rarely proliferous, with short incurved opaque, grey-green leaves, covered with minute spines. The variety *livida* is less pubescent with fewer, broader leaves and with pellucid spots on the leaves.

Distribution: Both of the varieties occur in a restricted area. The typical variety occurs at Sandberg, just S of Worcester. The variety *livida* occurs at Lemoenpoort, S of Worcester.

HAWORTHIA PULCHELLA **M.B Bayer** This stemless species is only occasionally proliferous. It has coriaceous leaves with block-patterned reticulations on an incurved surface. The leaf-colour is dark purple to dark to emerald green with pronounced white spines on the margins and keels. The variety *globifera* is glabrous, forms clusters and is slightly stem-forming.

Distribution: This attractive species occurs from S of Konstabel station, W of Matjiesfontein to W and S of Touws River. The variety *globifera* occurs SW of the Anysberg in the Little Karoo.

Haworthia pulchella (below) in habitat near Touws River.
H. pulchella* var. *globifera (Right) in habitat S of Touwsberg, near Touws River
Photos Kuba Jilemicky







Kuba Jilemicky

HAWORTHIA PYGMAEA **V. Poelln.** This is another retused species which is slowly proliferous and stemless. The purplish leaves are round-tipped with obscure raised tubercles, sometimes very papillose. The variety *acuminata* has sharp tips to the purplish to greenish-red retused leaves. The variety *argenteo-maculosa* is separated from the typical variety by the conspicuous white flecking of the leaves.

Distribution: The typical variety is confined to a restricted area between Mossel Bay and Great Brak. The variety *acuminata* occurs in a restricted area around the Gouritz River mouth. The variety *argenteo-maculosa* occurs E of the Gouritz River across to Mossel Bay. The variety *dekenahii* occurs only at Draaihoek near Riversdale.

HAWORTHIA RETICULATA **Haw.** This is a proliferous species which forms short stems. The sub-erect, yellowish-green to brownish-green leaves are incurved, lanceolate to acuminate, opaque with a reticulated patterning. Margins and keels frequently have short spines. The variety *hurlingii* is a compact form which forms small clumps of small obtuse leaves. It is a smooth to densely spined form with whitish flecking. Var. *nigra* differs in its dark colouration. The variety *subregularis* is a larger form with more spreading leaves.



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky

1 & 2.. ***Haworthia pubescens*** in habitat at Sandberg W of Calitzdorp
3 ***H. pubescens*** **var.** ***livida*** in habitat at Sandberg W of Calitzdorp.
4. ***Haworthia pygmaea*** in habitat at Duinzicht, near Mossel Bay
5. ***H. pygmaea*** **var.** ***acuminata*** in habitat at Vleesbaai, SW of Mossel Bay
6. ***H. pygmaea*** **var.** ***argenteo-maculosa*** in habitat at Cooper Siding, W of Albertinia
7. ***H. pygmaea*** **var.** ***dekenahii*** in habitat at Draaihoek, E of Oudtshoorn
8. ***Haworthia reticulata*** in habitat at Kransriviermond, S of Heidelberg
9. ***H. reticulata*** **var.** ***attenuata*** in habitat S of Bonnievale
10. ***H. reticulata*** **var.** ***subregularis*** in habitat at Uitvlug, W of Heidelberg
11. ***H. reticulata*** **var.** ***hurlingii*** in habitat at Goudmyn, S of Ashton



Bruce Bayer

Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Distribution: The typical variety occurs commonly between Worcester and Robertson in the Robertson Karoo. The variety *hurlingii* occurs W of Bonnievale. The variety *subregularis* occurs E of Worcester in the region around the Hex River Pass.

***HAWORTHIA RETUSA* (L.) Duval** This stemless plant is very slowly proliferous, very proliferous or solitary. The retused leaves are turgid, with pointed tips lined and windowed. The surface is spineless with the margins and keels rarely spined. The colour is brownish-yellow to pale green. The variety *suberecta* is a clump-forming variety with small erect, with very retused leaf ends. It is strongly mottled with the ends slightly truncated and rounded. The variety *turgida* is very proliferous. The leaves are turgid and often thick as they are broad. They are recurved or slightly retused. Their colour is yellow-green to pinkish with margins and keels slightly spined.

Distribution: The typical variety is widely distributed in the Riversdale district. The variety *suberecta* occurs from around Riversdale eastwards to E of Albertinia and S to the Gouritz Mouth. The variety *turgida* is found in the region of Tradouw Pass in the N, S to N of Bredasdorp across to Stilbaai and N to Heidelberg. The variety *nigra* is found N & S of Heidelberg.

***HAWORTHIA ROSSOUWII* V. Poelln.** This species is part of a very variable group related to *H. mirabilis*. It is, however, markedly different in appearance to that species. It is a stemless proliferous plant. The green leaves are erect and slightly retused with the retused apices translucent with a few lines. The margins and keels have short to longish white spines. The variety *calcarea* has shorter, stubbier leaves with shortish spines and is dark purple to darkish green. The variety *elizae* has slightly retused erect shortish leaves the tips of which are incurved. Their colour is reddish to reddish-green. The variety *minor* has green leaves which are slightly recurved, with the outer and inner leaf surfaces tuberculate with the keel and margins armed with short recurved spines. The variety *petrophila* is an erect species with dark green colouration and with whitish spots and the keels and margins are armed with upwardly-pointing whitish spines.



Kuba Jilemicky



Kuba Jilemicky

Top: ***Haworthia retusa*** in habitat at Soetmelksrivier, NW of Albertinia
Centre: ***H. retusa*** in habitat , W of Riversdale
Below: ***H. retusa* var. *suberecta*** in habitat at Hartebeeskuildam, NW of Mossel Bay.

Kuba Jilemicky





Kuba Jilemicky

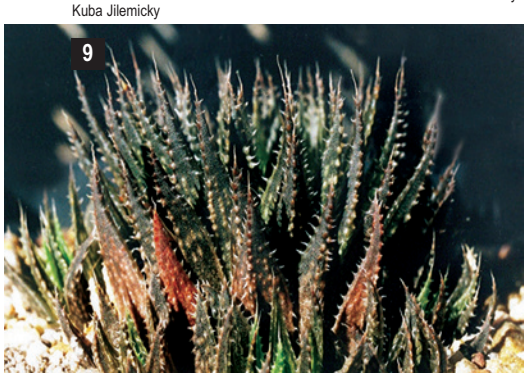


Kuba Jilemicky



Kuba Jilemicky

Kuba Jilemicky





Kuba Jilemicky

Kuba Jilemicky



Bruce Bayer



1 & 2. ***Haworthia retusa* var. *nigra***
(1) in habitat at Kransriviermond, S of Heidelberg
(2) in habitat at Goedehoop, S of Heidelberg
3. ***H. retusa* var. *turgida*** in habitat at Die Plotte, SW Cape
4 & 5. ***Haworthia russouwii*** (4) in habitat NE Grootkloof, E of Vermaaklikheid. (5) in habitat E of Soutkloof, near Bredasdorp
6. ***H. russouwii* var. *calcarea*** in cultivation, a plant from near De Hoop
7. ***H. russouwii* var. *elizeaea*** in habitat at Bromberg, W of Swellendam
8. ***H. russouwii var. minor*** in habitat at Rooivlei,NW of Bredasdorp
9. *H. russouwii* var. *petrophila* in habitat at Renosterfontein at the Karsrivier, SE of Bredasdorp

Kuba Jilemicky



Kuba Jilemicky



Distribution: *Haworthia russouwii* is endemic to the Overberg. The typical variety is known from NW of Bredasdorp to SW of Heidelberg. The variety *calcarea* occurs in the De Hoop nature reserve. The variety *elizae* occurs at Bromberg near Stormsvlei. The variety *minor* occurs near Rooivlei. The variety *petrophila* occurs near Napier.

HAWORTHIA SEMIVIVA **(V. Poelln.) M.B. Bayer** This stemless, seldom proliferous species has leaves that are pale green, translucent, broad at the base, tapering to a usually necrotic point and which are covered with long soft wrinkled hairs. They are incurved giving the plant a globose appearance.

Distribution: Widespread from S of Williston, S to Sutherland, E to Beaufort West and northwards to Victoria West.

HAWORTHIA SPRINGBOKVLAKENSIS **C.L. Scott** This very distinctive species is stemless and non-proliferous with very turgid, rounded leaves. The ends are translucent with several lines. The leaf surfaces are slightly viscid and in habitat this species, which is very attractive in cultivation, appears to be dirty and somewhat unattractive. The colour is dark reddish-purple. Some plants have very attractive reticulated surface markings.



Distribution: Occurs only in the Steytlerville district, on the Springbokvlakte, W of Kleinpoort.



Haworthia springbokvlakensis
in habitat in the eastern Springbok Vlakte
Photos Kuba Jilemicky



Haworthia transiens
in habitat in the Prince Alfred Pass, N of Knysna
Photo Kuba Jilemicky

HAWORTHIA TRANSIENS **V. Poelln.** This attractive compact, proliferous species which is closely related to *H. cymbiformis*, has green, incurved leaves each tipped with an awn. The leaf-apices are translucent with opaque lines.

Distribution: Occurs in the eastern Cape from W of Willowmore, through Steytlerville to near Uitenhage.

HAWORTHIA TRUNCATA **Schönland** This 'truncated' species is well-known in collections and is unmistakable in its appearance. It is slowly proliferous and stemless, very turgid, coriaceous and scabrid with minute tubercles. The leaf-tips are abruptly truncated. Their colour is very dark purplish-green to purple. The variety *maughanii* is similar in all respects except that it is rotate, not distichous.

Distribution: The typical variety occurs from N to S of Oudtshoorn and across to W of Calitzdorp. The variety *maughanii* occurs on the western limit of the typical variety, SW of Calitzdorp.

HAWORTHIA VARIEGATA **Bolus** This is a stemless, proliferous species with erect, slender leaves, dark green with strong variegated markings. The margins and keels are spined. The variety *hemicrypta* is only moderately variegated or plain and slightly recurved. The variety *modesta* has broader and shorter less variegated leaves with less conspicuous spination. The variety *petrophila* has shorter, slender and more recurved leaves than var. *hemicrypta*. The spination is stronger and denser.



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky

Robin Frandsen



Kuba Jilemicky

1 & 2. ***Haworthia semiviva*** (1) in habitat near Beaufort West
(2) A plant from S of Victoria West
3. ***Haworthia variegata*** in habitat at Swartklip, SE of Riversdale
4. ***H. variegata* var. *modesta*** in habitat at Kathoek, ENE of Napier
5. ***H. variegata* var. *petrophila*** in habitat at Windsor, SE of Riversdale
6. ***H. variegata* var. *hemicrypta*** nr Melkhoutrivier. NW of Witsand
7 ***Haworthia truncata*** in habitat S of Calitzdorp.
8 & 9. ***truncata* var. *maughanii*** in habitat near Dysselsdorp, Little Karoo





Kuba Jilemicky

Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Distribution : The typical variety occurs E and N of Stilbaai. The variety *hemicrypta* on the N slopes of the Potberg in the De Hoop Nature Reserve, The variety *modesta* at Kathoek and on the nearby Potberg. The variety *petrophila* at Karsrivier, just E of Bredasdorp.

HAWORTHIA VINCENTII **Breuer** This clump-forming species is somewhat similar to *H. esterhuizenii* and *H. retusa* var.. *turgida*. The leaves are mostly semi-retuse, usually with a slight twist. The lower leaf surfaces have a few dots similar to *H. esterhuizenii,* but this is not shared by var. *turgida*. As it is found in close proximity to *H. esterhuizenii* it could be construed that it is of hybrid origin.

Distribution: *Haworthia vincentii is* localised to a mountain slope E of Albertinia

Top & bottom: ***Haworthia vincentii*** in habitat E of Albertinia
Photos Kuba Jilemicky





HAWORTHIA VLOKII **M.B. Bayer** This is a stemless proliferous species with spreading to sub-erect, slightly incurved at the tips, opaque, reddish to green leaves. The margins and keels are armed with short, thin spines and the leaves are spotted on both surfaces.

Distribution: *Haworthia vlokii* occurs on the upper slopes of the Swartberg around Meiringspoort.

HAWORTHIA WITTEBERGENSIS **W.F. Barker** This is a stemless, slowly proliferous species with long, slender amplexicaul leaves dark green to purplish leaves with white spines on the margins and keel. Nearly always found in rock crevices.

Distribution: *Haworthia wittebergensis occurs on the* S side of the Witteberg, S of Matjiesfontein through to the Rooiberg in the east..

HAWORTHIA ZANTNERIANA **V. Poelln.** This is a stemless, proliferous species which may form dense clumps. It has soft, glabrous leaves which are attenuate and spreading and somewhat incurving. Their colour is pale green and usually with pellucid, longitudinal markings. The variety *minor i*s a small form with unmarked leaves.

Distribution: The typical variety occurs in the mountains N of Steytlerville and westerly to N of Oudtshoorn. The variety *minor* occurs NE of Willowmore.

Kuba Jilemicky





Robin Frandsen



Kobus Venter

1 & 2. ***Haworthia vlokii*** (1) in habitat in the Meiringspoort Pass
(2) A plant from the Swartberg, above the Meiringspoort Pass
3 & 4. ***Haworthia wittebergensis*** in habitat at the Rooinek Pass, S of Laingsburg
5. ***Haworthia zantneriana*** a plant from N of Campherpoort, NW of Steytlerville.
6. ***H. zantneriana*** **var. *minor*** a plant from Miller Station,NW of Steytlerville

Kobus Venter





Kuba Jilemicky

Kuba Jilemicky



Sub-genus *Hexangulares*

Haworthiopsis attenuata **Haw.** This is a widespread stemless, very proliferous species with hard, incurved attenuate, sub-erect to spreading leaves. The surface is scabrid with raised, white, non-confluent tubercles. The variety *glabrata* differs from the typical variety in being spreading, with the leaves having a blunt keel. The tubercles are much finer and tend towards being arranged laterally lineate. The variety *radula* has much finer raised excrescences, otherwise is virtually identical to the typical variety.

Distribution: The variety *attenuata* is widespread from E of the Fish River to beyond Humansdorp. The variety *glabrata* is known only from Collywobbles near Mthatha. The variety *radula* occurs in the immediate vicinity of Hankey, NW of Humansdorp.

Haworthiopsis bruynsii **M.B. Bayer** This interesting species appears to belong under the sub-genus *Haworthia* and not under *Hexangulares*. It is similar in appearance to *H. springbokvlakensis* but has more scabrid leaf-ends. It is placed in this sub-genus by virtue of its flower-form. It is solitary with a flattened retused leaf-end, scabrid with small raised tubercles above. In habitat the plant is almost level with the surface with only the flat tips showing.

Distribution: Two distinct localities which are known for this species both of which are SE of Steytlerville in the S Cape.

Haworthiopsis coarctata **Haw.** This is a stemmed proliferous species, which is erect, spreading or incurved. The leaves are scabrid and brownish-green usually with rounded tubercles. The typical variety is very variable. The variety *greenii* lacks the tubercles of the typical variety. The narrower var. *adelaidensis* is closest to and similar to var. *tenuis* but is a much shorter plant. The variety *tenuis* is usually about half the diameter of the typical variety, with the leaves more slender.

Distribution: The typical variety occurs W of the Fish River, to N of Grahamstown and extending E towards Port Elizabeth. The variety *greenii* occurs at Howiesonpoort, a small area W of Grahamstown. The variety *adelaidensis* occurs from near Riebeek East to W and E of Grahamstown. The variety *tenuis* occurs near the coast along the lower Bushmans River.

Haworthiopsis fasciata **(Willd.) Haw.** This robust species is proliferous, slightly caulescent and has erect, to slightly spreading firm, leaves which are harder than those of *H. reinwardtii*. Colour is darkish-green with white tubercles arranged in lateral lines, sometimes coalescing on the inner-sides of the leaves only. It is a quite variable species

Distribution: This is a fairly widespread species, occurring from west of Storms River to Port Elizabeth and N of Uitenhage.

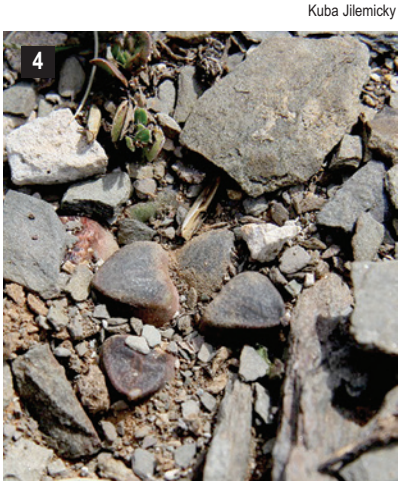
Haworthiopsis glauca **Baker** This is a caulescent proliferous species with hard erect, incurving glaucous, green leaves. The leaves are scabrid with small tubercles or without. The plants of the species are smooth in the E of their range and tend to become slightly tuberculate towards the W of its range, where the var. *herrei* occurs. The variety *herrei* is distinguished by its more slender leaves which are usually slightly recurved and with fine tubercles.

Distribution: The typical variety occurs from the Zuurberg Pass, NE of Port Elizabeth in the Zuurberg range, to N of Jansenville in the NW and to Willowmore in the SW. The variety *herrei* occurs from N of Port Elizabeth across to Steytlerville.

Kobus Venter



Kuba Jilemicky



Kuba Jilemicky





Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



Kobus Venter

1. ***Haworthiopsis attenuata*** in habitat from nr Coega, E Cape
2. ***H. attenuata* var. *radula*** in habitat from nr Hankey, E Cape
3 & 4. ***Haworthiopsis bruynsii*** (3) in cultivation (4) In habitat on the eastern Springbokvlakte, E Cape
5. ***Haworthiopsis coarctata*** in habitat at Kariega, E Cape
6. ***H. coarctata* var. *adelaidensis*** in habitat nr Grahamstown
7. ***H. coarctata* var. *tenuis*** in habitat at Harvestvale, E Cape
8 ***Haworthiopsis fasciata*** in habitat at the Baken River NW of Hankey
9. ***Haworthiopsis glauca*** in habitat nr Fullerton, E Cape
10. ***H. glauca* var. *herrei*** in habitat at Campherspoort, E Cape

Kuba Jilemicky



Kuba Jilemicky



Haworthiopsis granulata **Marloth** Formerly a subspecies of *H. venosa*, this unmistakable proliferous species is usually caulescent with spreading deltoid leaves which are heavily scabrid on their underside, with the concave tops of the leaves smooth with tessellate markings. Their colour is green to purplish.

Distribution: Occurs from Touws River in the S, and in the southern half of the Ceres Karoo with Swartruggens range on the W and the Roggeveld in the E as far N as the Gannagas Pass.

Haworthiopsis koelmaniorum **Oberm. & Hardy** Few *Haworthia* species occur outside the Cape, among these are *H. koelmaniorum* and *H. limifolia* in the NE of the Country, *H. tessellata* in Namibia and possibly *H. arachnoidea* in the extreme SW of Namibia. This species is a stemless, slowly proliferous plant with hard, thick deltoid recurved teeth heavily scabrid with raised ridges on the underside of the leaves. The opaque leaves are dark brownish-green colour. The variety *mcmurtryi* is smaller with retused leaf-tips which may be slightly translucent on the top, but also heavily scabrid. Both may be propagated by leaf cuttings.

Distribution: Both varieties are limited to a small range near the Loskop Dam, SW of Groblersdal in W Mpumalanga.

Haworthiopsis limifolia **Marl.** This species is slowly proliferous, with or without stolons. It has ovate-lanceolate spreading leaves that are opaque, very dark to light green. The surface has white to concolorous tubercles or with raised transverse lines. The margins and keel are scabrid or with confluent transverse ridges. The variety *arcana* is without tubercles, but has file-like ridges across the leaf-face. The variety *gigantea* differs in its incurved, upright leaves with some of the tubercles coalescing. The variety *glaucophylla* has glaucous glabrous leaves with sharp margins. The variety *ubomboensis* is a stoloniferous, glabrous, bright-green species with spreading lanceolate leaves with incurved margins.

Distribution: The typical variety is widespread from N to E (Lebombo Mountains) to S Swaziland, from Saddleback near Barberton; from S of Piet Retief across to near Golela, also recorded along the border of South Africa and Mozambique across the Ndumo Game reserve to the coast. The var. *gigantea*



Kuba Jilemicky

Haworthiopsis koelmaniorum (Top) in habitat at Ntwane, NW of the Loskop Dam, Mpumalanga.
(Centre) In cultivation a plant from the Groblersdal area.
H. koelmaniorum* var. *mcmurtryi (Below) a plant from near the Loskop Dam



Kobus Venter

Kobus Venter





Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky

1 & 2. ***Haworthiopsis granulata*** (1) in habitat at Touws River (2) in habitat at Oskopvlakte, E of Laingsburg
3. ***Haworthiopsis limifolia*** in habitat at iSiteki (Stegi), Swaziland
4. ***H. limifolia* var. *gigantia*** a plant from Zuka, NE Hluhluwe, Zululand.
5. ***H. limifolia* var. *glaucophylla*** a plant from Three Sisters, near Barberton.
6. ***H. limifolia* var. *ubomboensis*** a plant from S of Stegi (iSiteki) E Swaziland
7. ***H. limifolia* var. *arcana*** a plant from near Mbombela (Nelspruit).



Kobus Venter



Kobus Venter

Kobus Venter



Kuba Jilemicky



near Louwsburg, west of Pongola. The var. *arcana* occurs near Hectorspruit to Barberton. The var. *glaucophylla* occurs at Three Sistersb Barberton dist. The variety *ubomboensis* occurs near iSiteki on the W of the Lebombo Mountains in Swaziland.



Haworthiopsis longiana in habitat S of Patensie, *Photo Koos Venter*

HAWORTHIOPSIS LONGIANA **V. Poelln.** Is a stemless, slowly proliferous species, which sometimes forms large clumps, leaves are long, attenuate, incurved rigid and scabrid or smooth or sometimes with small coalescing white tubercles.

Distribution: This species appears to be confined within an area bounded by Humansdorp in the E, to Patensie in the W.

HAWORTHIOPSIS NIGRA **(Haw.) Baker** This species is usually caulescent. It is slowly proliferous and often stoloniferous. The canaliculate dark purple leaves are ovate-deltoid, and arranged in 3 vertical tiers. The surfaces are scabrid with distinct, raised, non-confluent tubercles. The var. *diversifolia* is more tightly packed with the canaliculate leaves more pronouncedly trifarious and less recurved.

Distribution: This widespread species occurs from Middelburg in the N, westwards to Queenstown and S to Grahamstown and W to beyond Steytlerville; also reported from near Oudtshoorn. The variety *diversifolia* occurs W and S of Merweville and across to Beaufort West and S to Steytlerville.

HAWORTHIOPSIS PUNGENS **M.B. Bayer** ***Haworthiopsis* is a** very proliferous species is glabrous, caulescent, trifarious - 5-farious with smooth rigid, sharp-pointed leaves which are green in the shade and reddish in sunlight.

Distribution: E of Uniondale to near Joubertina in the E to N of Kareedouw.

HAWORTHIOPSIS REINWARDTII **(Salm-Dyck) Haw.** This is a proliferous stemmed species with erect, somewhat recurved, scabrid brownish-green leaves with flattened scale-like white tubercles. The forma *chalumnensis* is consistently a more robust form, otherwise there seems to be little to justify its retention as a separate variety. The forma *kaffirdriftensis* is a rare and attractive variety which differs in its longitudinal rows of conspicuous white tubercles on the leaves. The forma *olivaceae* differs in its unusual colour, rounder, sparser tubercles. The forma *zebrina* has conspic-uous transverse white bands on the outsides of the leaves. The variety *brevicula* is a small variety.

Distribution: The typical variety is found mainly along the coastal strip from Port Alfred to East London and further inland E and W of Grahamstown. The forma *chalumnensis* is found along the Chalumna River NE of Peddie. F. *kaffirdriftensis* occurs on the E bank of the Fish River at Kaffirdrift. The forma *olivaceae* occurs on the W bank of the Fish River near Kaffirdrift. The forma *zebrina* occurs near Kaffirdrift. The variety *brevicula* occurs SE of Grahamstown about halfway to Port Alfred.

Kuba Jilemicky





Kobus Venter

1. ***Haworthiopsis nigra*** at Kraanvoëlkuil, near Pearston
2. ***H. nigra* var. *diversifolia*** a plant from N of Prince Albert
3. ***Haworthia pungens*** in habitat at Braamrivier, ENE of Joubertina
4. ***Haworthia reinwardtii*** in habitat at Kaysers Beach, SW of East London
5 & 6. ***H. reinwardtii* f. *chalumnensis*** (7) in habitat at the Chalumna River (8) In cultivation in Johannesburg
7. ***H. reinwardtii* f. *kaffirdriftensis in cultivation*** a plant from Kaffirdrift,
8. ***H. reinwardtii* var. *brevicula*** in habitat W of Kaffirdrift
9. ***Haworthiopsis reinwardtii* f. *olivacea*** in habitat at Kaffirdrift, at the Great Fish River.
10. ***H. reinwardtii* f. *zebrina*** a plant from Kaffirdrift



Kobus Venter



Kobus Venter

Kuba Jilemicky



Kuba Jilemicky





Kobus Venter

Robin Frandsen



Robin Frandsen



Kobus Venter



***Haworthiopsis scabra* Haw.** This stemless species is slowly proliferous, sometimes forming large clumps. Leaves are upright to spreading, tuberculate to smooth, they are attenuate, canaliculate and incurving, tending to twist. The typical species is very dark purplish-brown to light brown, lightly to heavily tuberculate, may be tightly incurved, and rotate or erect-spreading. The variety *lateganiae* has longish, smooth, shiny, spreading canaliculate leaves, which are light green to yellowish-green. The variety *morrisiae* is markedly rotate with shorter green to yellow to reddish scabrid leaves. The leaves of the plant contort in several directions. The variety *starkiana* is similar in growth form to var. *scabra,* twisting and contorting in several directions. Leaves are less turgid and swollen. The leaves may be short or long and the colour is usually conspicuously yellow but may be dark green.

Distribution: The typical variety occurs from Ladismith to Willowmore. The variety *lateganiae* near to Oudtshoorn. The variety *morrisiae* occurs N of Oudtshoorn The variety *starkiana* occurs only at Schoemanspoort, just N of Oudtshoorn.

***Haworthiopsis sordida* Haw.** This stemless species is seldom proliferous. The leaves are canaliculate, erect and slightly spreading, attenuate, lanceolate and dark-grey tuberculate. The surface is tuberculate. The variety *lavranii* is a smaller plant with rather strongly recurved leaves.

Distribution: Occurs around Addo and Kirkwood and across to Kleinpoort, E of Steytlerville. The variety *lavranii* occurs from SE of the Springbokvlakte to Kleinpoort.

***Haworthiopsis tessellata* Haw.** This very widespread and abundant haworthia is closely related to *H. venosa*. It is very variable but cannot be mistaken for *venosa*. The plant is stemless and proliferous. The leaves are spreading, tuberculate on the underside and smooth with a distinct reticulate pattern. The colour is green to brown.

Distribution: Very widely distributed it is found from southern Namibia, southwards to N of Laingsburg and across to near Grahamstown; northwards into the southern Free State, into the Northern Cape Province and across into S Botswana.

***Haworthiopsis venosa* (Lam.) Haw.** Stemless, slowly proliferous by stolons or off-sets with spreading or sub-erect and canaliculate leaves. Their colour is purplish to light-brown.

Distribution: Occurs in the vicinity of the Breede River, W of the De Hoop Nature Reserve also in the Bontebok Park.

***Haworthiopsis viscosa* (L.) Haw.** This is a caulescent, proliferous species which is unmistakable. The leaves are closely adnate, spreading and arranged trifariously with the surface scabrid and with very pungent points to the deltoid leaf-tips.

Haworthiopsis venosa in habitat SW of Swellendam *Photo Kobus Venter*







Judd Kirkel Welwitch



Robin Frandsen



Kuba Jilemicky

Kobus Venter





1. ***Haworthiopsis scabra*** Left: in habitat nr Braamspruit E of Joubertina
2. ***H. scabra* var. *lateganiae*** W of De Rust
3. ***H. scabra* var. *morrisiae*** plant from Schoemanspoort, N of Oudtshoorn
4. ***H. scabra* var. *starkiana*** in habitat at Schoemanspoort, N of Oudtshoorn
5. ***Haworthiopsis sordida*** in habitat at Kleinpoort, E Cape
6. ***H. sordida* var. *lavranii*** in cultivation from Tretyre, Springbokvlakte, SW of Kleinpoort
7 & 8. ***Haworthiopsis tessellata*** (7) in habitat (8) In habitat at Helshoogte, Richtersveld National Park
9. ***Haworthiopsis viscosa*** in habitat at Studtis, SE of Steytlerville

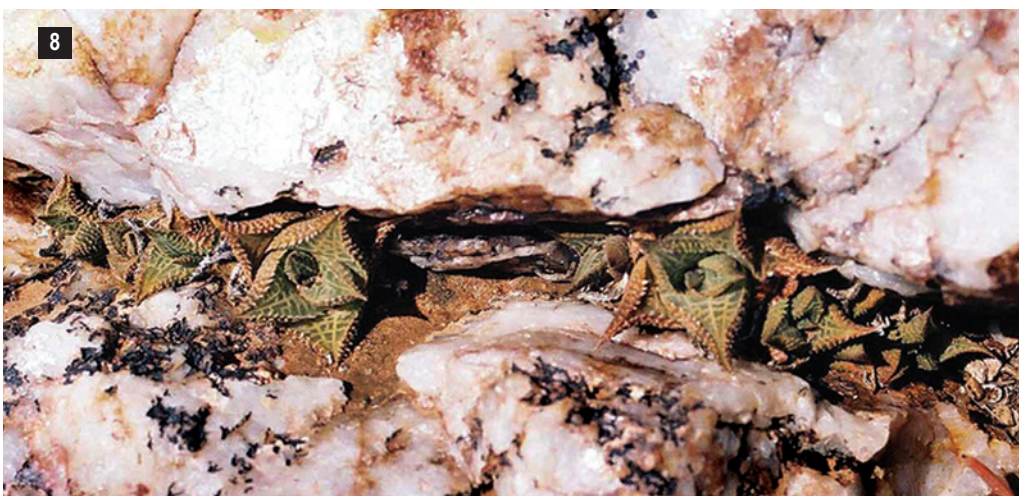
Kuba Jilemicky



Kobus Venter

Kuba Jilemicky

Robin Frandsen





Distribution: Very widespread across Sutherland in the NW, southwards to N of Montagu, across the Little Karoo and as far E as Steytlerville and N to Graaff-Reinet.

HAWORTHIOPSIS WOOLLEYI **V. Poelln.** This species has more leaves than *H. venosa*. The leaves are proportionally longer and more attenuate. This rare variety is probably extinct in the wild and also not easy to cultivate but does propogate easily from seed and offsets.

Distribution**:** The original locality seems to have been denuded of the species by injudicious farming practices. It originates from a small area SW of Kleinpoort.



Haworthiopsis woolleyi in cultivation, a plant from N of Middelwater, SW of Kleinpoort
Photo Kuba Jilemicky

Sub-genus *Robustipedunculares*

TULISTA KINGIANA **V. Poelln.** A slowly proliferous, robust stemless species with hard, thick attenuate leaves with pungent tips. Under-surfaces are somewhat transversely rugose with slightly raised white spots on the rugae. The insides are smooth. Their colour is green to yellowish.

Distribution: Occurs in the Herbertsdale, Mossel Bay area.

TULISTA MARGINATA **(Lam.) Stearn** This is a slowly proliferous, stemless species. It is the largest of the haworthias, growing up to 20 cm tall. The leaf surface is usually smooth, rarely with tubercles and the colour is pale brownish-green. The sharp-pointed leaves are lanceolate, proportionately wide, but can be somewhat narrow.

Distribution: This species occurs in the southern Robertson Valley, from Bonnievale to the Bredasdorp region in the Overberg and across to the Riversdale region.

TULISTA MAXIMA **(Haw.) Stearn** A stemless, slowly proliferous species with spreading to erect deltoid, incurved lanceolate leaves. It has many to few white to concolorous raised tubercles, some with doughnut-shaped tubercles covering the leaves. The colour ranges from green to brownish purple.

Distribution: Fairly widely distributed: in the Robertson Karoo from Worcester to Robertson, W of Swellendam, in the Little Karoo from Montagu to the Rooiberg and across to N and NW of Laingsburg.

TULISTA MINIMA **(Ait.) Haw.** This is a smaller species with spreading to erect sharp-pointed bluish-green leaves. It is stemless and slowly proliferous. Both leaf surfaces are covered with raised, flattened, non-confluent white tubercles, with some specimens quite spectacular in this respect. The variety *poellnitziana* has grey-green, longer and slender, leaves.

Kuba Jilemicky





Kuba Jilemicky



Kuba Jilemicky



Kuba Jilemicky



1 & 2.. ***Tulista kingiana*** (1) in habitat N of the Great Brak River in the SW Cape. (2) in habitat near the Great Brak River
3 & 4. ***Tulista marginata*** in habitat (3) near Ashton, SW Cape. (4) in habitat near Heidelberg, SW Cape. A typical form
5. ***Tulista maxima*** in habitat at Agterkliphoogte, SW of Robertson
6 - 8. ***T. minima*** in habitat (6) S of Kleinberg, W of Mossel Bay. (7) at Mierkraal W of Riviersonderend. (8) NW of Napier, SW Cape
10. ***T. minima*** **var. *poellnitziana*** in habitat at Sanddrift, NW of Drew, SW Cape



Kuba Jilemicky



Kuba Jilemicky

Kuba Jilemicky





Distribution: The typical variety occurs along the northern slopes of the Langeberge in the Little Karoo from Brandrivier, just W of the Garcia Pass to Herbertsdale in the E. and in the Overberg from Bredasdorp across the E of the Gouritz River. The variety *poellnitziana* occurs W of Montagu, between Swellendam and Robertson.

Tulista opalina **M. Hyashi** This is a rare and particularly attractive species which is characterised by its glossy transparent tubercles. It is solitary and is larger than its closest relative, *T. minima*.

Distribution: Occurs between Garcia Pass and Barrydale in the S Little Karoo.

APOCYNACEAE

The southern African succulent members of the family Apocynaceae comprise some bizarre and probably the most showy and attractive of the succulent plants. They range from shrublets, which have large subter-ranean tubers, to fairly large trees with grossly swollen trunks and are among the most sought-after collector-plants. They are especially characterised by the twin *buckhorn* seedpods, a character which they have in common with the Asclepiadaceae. This character has prompted the subsuming of Asclepiadaceae under Apocynaceae, which transfer is not upheld in this work.

Adenium Roem. & Schuldt

Adenium boehmianum **Schinz** This is a small shrub, up to 1.5m tall. The reddish to grey stems and branches are upright and much-branched and are felty when young, which soon wears off leaving a glabrous, smooth surface. The leathery, felty ovate leaves are terminal. The inflorescence is terminal and comprises a panicle of several white to pale pink flowers with darker pink throats. The flowers and leaves appear together.

Distribution: Occurs in the NW of Namibia, away from the coast, inland towards Tsumeb and southwards to N of Windhoek and narrowly into Angola.

Adenium multiflorum **Klotsch** In flower this species is arguably the most spectacular of southern Africa's succulents. Many-branched, with a swollen stem which can be in excess of 75 cm in diameter, it can grow to in excess of 2.5m. It comprises a swollen stem . The erect stem and branches are greenish to pale yellowish-beige and glabrous. The inflorescence is a compact terminal umbel which precedes the formation of leaves. The flowers are felty pale pink with the crenulate petal margins dark pink.

Distribution: This species occurs in eastern Limpopo Province, eastern Mpumalanga, southern Mozambique and NE KwaZulu-Natal.

Adenium oleifolium **Stapf** This dwarf species is also a spectacular sight when in flower. The many thin branches, erect and up to only 25 cm long, are produced from a large caudex completely or less commonly partially subterranean The thick, felty, folded lanceolate leaves and flowers are produced together terminally. The tubular lowers are pale pink with a pale orange throat which is longitudinally striped from the base to the throat.

Distribution: This species occurs in the Kalahari region of the W of Kimberley and into the Kalahari National Park of the N Cape and W of Gaborone in Botswana.

Tulista opalina Left & right: in habitat at the Brandrivier, E of Vanwyksdorp, Little Karoo.
Photos Gerhard Marx





1 & 2. ***Adenium boehmianum*** in habitat at Epupa Falls, NE Namibia
3 & 4. ***Adenium multiflorum*** (3) in habitat the Save River, SE Zimbabwe. (4) close-up of the flower from Birchenough Bridge, SE Zimbabwe
5 & 6. ***Adenium oleifolium*** (5) in habitat within sight of, and E of, Upington (6) a paler-flowered plant in habitat



Niels Jacobsen



Niels Jacobsen



Judd Kirkel Welwitch





Niels Jacobsen

Tim Peatling



***Adenium swazicum* Stapf** This is a small beautiful species which grows up to 30 cm tall. It is produced from a large basal caudex much of which is subterranean. The branches are sub-erect with the leaves being produced terminally. The leaves are felty, lanceolate and sometimes folded. The flowers are produced simultaneously with the leaves and are pale pink with a darker throat.

Distribution: Occurs in N and E Swaziland, into the adjacent regions of Mozambique and KwaZulu-Natal and narrowly northwards into Mpumalanga.

Pachypodium Lindl.

There are some 18 species of *pachypodium*, of which 13 species are endemic to Madagascar. 5 species occur in southern Africa. The genus is characterised by its somewhat showy flowers

***Pachypodium bispinosum* (L.f.) A. de Candolle** All *Pachypodium* species have paired spines, so its name has no real significance. The species has a large generally subterranean tuber which has milky latex and the branches are of a sprawling habit. The green leaves are glabrous above and rough underneath. They are lanceolate with slightly recurved margins. The attractive flowers are cerise to pink inside and outside with white lobes.

Distribution: Confined to the E Cape from Graaff-Reinet in the N, southwards to the coast and across to Somerset East.

***Pachypodium lealii* Welw.** This species is a large shrub or a small tree which attains the height of up to 6m. The stem is probably more accurately described as a swollen tree trunk-like caudex. The branches are similar in appearance to those of *A. saundersii*, with paired long thorns and a cluster of very short sharp stipules just above the pair. The clear latex is very poisonous and has been utilised as an arrow poison. The white flowers are similar to those of *A. saundersii*.

Distribution: This species is confined to the NW of Namibia and narrowly into Angola.

***Pachypodium namaquanum* (Wyley ex Harv.) Welw.** This remarkable species, which inhabits desert places grows up to 2.5m tall and branches sparingly generally from near the base. It has thick, cylindrical tapering stems and branches which are thickly covered with spirally-arranged stipules, each the remains of a deciduous leaf and tipped with a 3–7 mm long stipular spine. The leaves, which are produced

Pachypodium namaquanum Known as the 'Halfmens' - almost human', this iconic species always tends north. The plant in habitat N of the Vandersterreberge, in the Richtersveld National Park. Opposite below left: Close-up of the flowers
Photo Gerhard Beukes





Niels Jacobsen

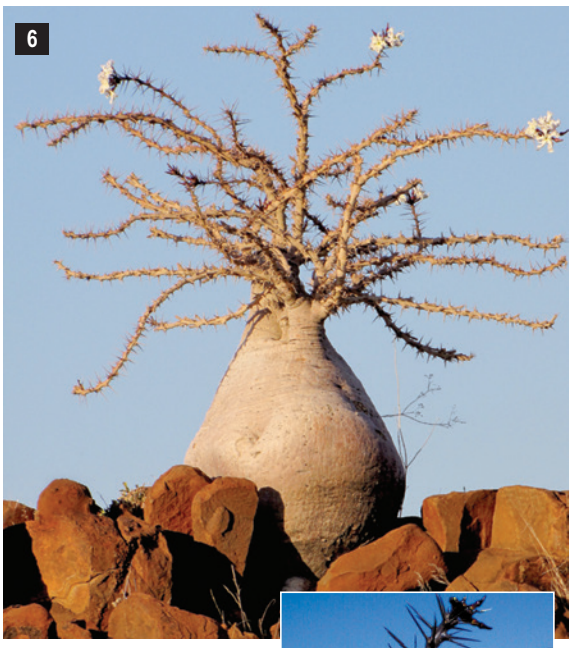


Niels Jacobsen



Priscilla Burgoyne

1 & 2. ***Adenium swazicum*** in cultivation at the Malelane Gate in the Kruger National Park.
Inset: close-up of the flower
3 - 5 ***Pachypodium bispinosum*** (3 & 4) in habitat near Coega in the E Cape
(5) Close up of the flowers and buds
6. ***Pachypodium lealii*** in habitat SE of Sesfontein, Kaokoveld, NW Namibia
Inset; close-up of a flowering branch



Judd Kirkel Welwitch



Judd Kirkel Welwitch

Robin Frandsen



Tim Peatling



Robin Frandsen



Gerhard Beukes



terminally, are velvety and have a crenate margin. The flowers, produced together with the leaves, are ciliate inside and out, green on the outside and wine-red on the inside.

Distribution: It occurs in a fairly restricted range and is an inhabitant of the drier parts of the NW Cape and into SW Namibia on rocky hillsides and mountain slopes.

PACHYPODIUM SAUNDERSII **Welw.** This species grows up to 1.5m and has a large tuberous caudex above-ground from which the branches arise. The stems are thin and have a peeling bark and rebranch along their length. Leaves arise alternately along the stem and new leaves on the old branches arise from short peduncles, the source of the original leaves. At the leaf nodes are long paired spines with a cluster of short stipular spines. The inflorescence arises terminally and produces a cyme of several white flowers.

Distribution: Occurs from NW KwaZulu-Natal through E and N Swaziland, E and central Mpumalanga and central N Limpopo Province. In Zimbabwe it occurs in the E and S regions and narrowly into the adjacent Mozambique.

PACHYPODIUM SUCCULENTUM **(L.f.) A. de Candolle** This species has a thick turnip-shaped caudex which is half to almost fully submerged. The branches can reach up to 60 cm tall but are usually shorter. It is sparingly branched with the branches hairy when young but becoming glabrous and wrinkled with age. They have a milky latex. The leaves are hairy on both sides and are in clusters and scattered along the stems. They are together with longish paired stipular spines. The inflorescence is a few-flowered terminal cyme and the flowers are crimson, pink or white.

Distribution: Distributed across the southern, and central Karoo, to NW of Kimberley, E Cape and W Free State.

ASTERACEAE

OTHONNA L.

Othonna is an Old World genus, which occurs mainly in southern Africa. It comprises non-succulents as well as succulents. The succulent othonnas are generally found in the N and W Cape and in the SW parts of Namibia. As the genus is very large only a representative selection is included here

OTHONNA ARBUSCULA **(Thunb.) Schultz-Bipontinus** This is a loosely-branched species growing to 35 cm tall. The stems are grey in colour. The leaves are green and tufted at the apices of the stems. Flowers are yellow.
Distribution: Favours rocky slopes, occurring in the NW Richtersveld and into SW Namibia.

OTHONNA CLAVIFOLIA **Marloth** This is a low-growing desert species, favouring rocky and sandy places. The ovate, green leaves, purplish in the resting period, cluster at the end of the grey stems. Flowers are yellow.

Distribution: Rocky hillocks and sandy plains in the extreme NW Cape in the Richtersveld on sandy and rocky plains N of Steinkopf in the Richtersveld.

OTHONNA CYCLOPHYLLA **Merxm.** This succulent *Othonna* grows up to 60 cm tall. The stem and branches are whitish-grey. The leaves are tufted at the tips of the branches, flat and slightly crenulate at the tips, bluish-green. The flowers are solitary, yellow.

Distribution: *Othonna cyclophylla* inhabits the N central Richtersveld National Park and northwards into the Sperrgebiet, SW Namibia to N of Warmbad.

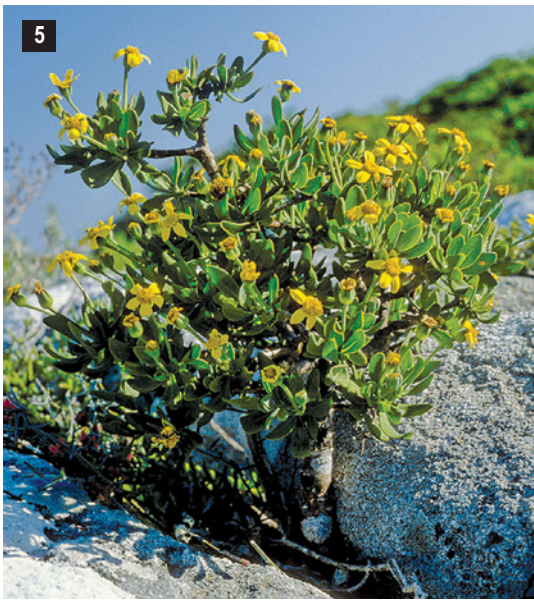
Robin Frandsen





Judd Kirkel Welwitch

1 & 2. ***Pachypodium saundersiae***
(1) the plant in cultivation at Mopani Camp: Kruger National Park
(2) Close-up of a flowering stem at the Strydom Tunnel, N of Ohrigstad
3 & 4. ***Pachypodium succulentum*** (3) in habitat. (4) Close up of the flower in habitat near Prieska
5. ***Othonna arbuscula*** in habitat at Donkergat in the Richtersveld National Park
6 & 7. (6) ***Othonna clavifolia*** in habitat near Beauvallon in association with *Conophytum saxetanum, Euphorbia* spp & *Crassula plegmatoides*
(7) Inset: In habitat near Beauvallon, E of Alexander Bay
8. ***Othonna cyclophylla*** in habitat in the northern Richtersveld National Park



Gerhard Beukes

Robin Frandsen





Gerhard Beukes



Gerhard Beukes

Gerhard Beukes



Robin Frandsen



***Othonna euphorbioides* Hutchins.** This is a dwarf species which grows not much more than 10 cm tall. The stem and branches are yellowish-grey and peeling. The light-green, deciduous leaves are spathulate and tufted at the tips of the branches. The flowers are small and yellow. The peduncles are long and persistent, forming sharp spines.

Distribution: Occurs in SW Namibia and into the W Richtersveld and S to Kamieskroon

***Othonna opima* Merxm.** This is a very succulent species, up to 25 cm tall, which is sparsely branched on a very short stem, with fleshy, erect cylindric leaves. The leaves are green and somewhat banana-shaped. The flowers are a several-headed cluster of florets which are yellow in colour.

Distribution: Occurs in the N central Richtersveld National Park, northwards to near Lüderitz in Namibia.

***Othonna pygmaea* Compton** This is a small species as its name suggests. It is somewhat contorted in its shape, by virtue of its contiguous branches, with whitish to brownish peeling bark. The green leaves are in clusters with a few woolly hairs on their base and are quite variable, from spathulate to obtuse. The inflorescence is 1—2, simple or slightly panicled with yellow florets.

Distribution: Occurs in SW Namibia and into the W Richters-veld and S to around Clanwilliam, SW Cape.

Senecio L.

This is a large genus of succulent to non-succulent plants. Only three species, which are represented here, are plants which are of collectable interest.

***Senecio aizoides* (DC.) Sch.** This species is a glabrous shrub with a short stem. The leaves are crowded at the tips of the branches, laterally compressed acute and mucronate. Their colour is green, shading to purple at the tips. Flowers are red.

Distribution: Occurs from the eastern Cape northwards into the E Great Karoo.

***Senecio haworthii* (Haw.) Sch.** This is a beautiful species which grows in erect clumps, sometimes prostrate with age, up to about 1.5 m. The leaves cover the stems and are shortly petiolate, cylindric and, like the branches, are covered with a white felty indumentum. The flowers are numerous and yellow.

Distribution: occurs in the southern Cape, N of the Witteberg and into the Little Karoo.

***Senecio radicans* (L.f.) Sch.** This well-known species forms mats of much-branched slender prostrate rooting stems, with round to slightly lanceolate green leaves, with a few longitudinal translucent stripes, It can easily be confused with *S. rowleyanus* Jacobsen, with which it is probably synonymous (no picture available). That species has more lanceolate leaves with a single translucent stripe. Flowers of *S. radicans* are white.

Distribution: This is common from the Robertson Karoo across to the eastern Cape and northwards into S Namibia. *S. rowleyanus* is found in S Namibia.





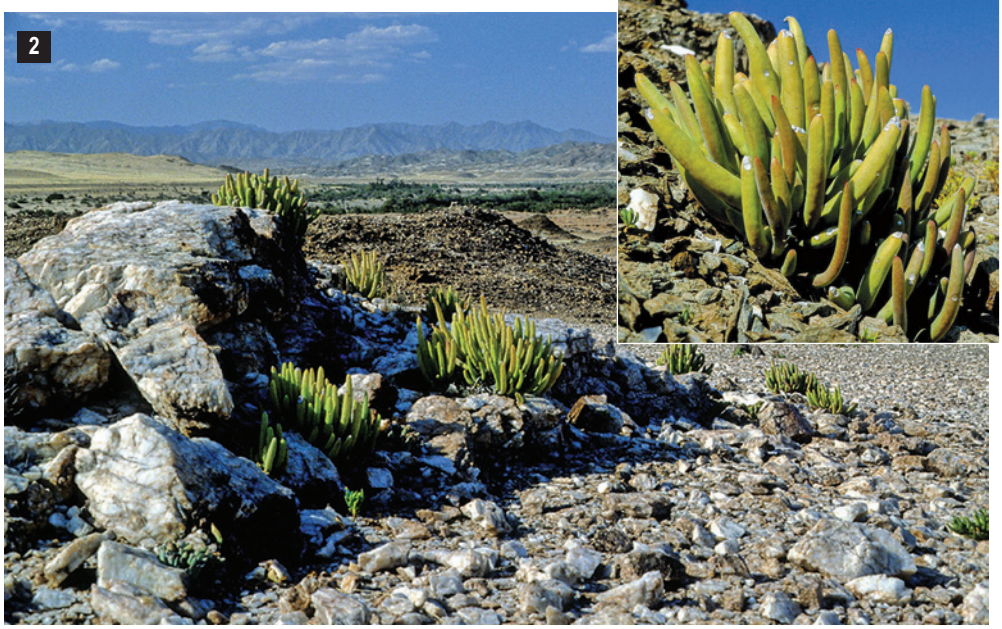


Judd Kirkel Welwitch

1. ***Othonna euphorbioides*** in habitat on the Kamiesberg
2. ***Othonna opima*** in habitat near Jakkalsberg in the Richtersveld National
3. ***Senecio aizoides*** in habitat near Jeffrey's Bay, E Cape
4. ***Senecio radicans*** in habitat and in association with *Haworthia mucronata* var. *morriseae* near Oudtshoorn
5 & 6. ***Senecio haworthii***
(5) in cultivation at Kirstenbosch Botanic Gardens
(6) in habitat S of Matjiesfontein (true colour)
7 & 8. ***Othonna pygmaea*** (7) in habitat near Beauvallon, E of Alexander Bay
(8) in habitat S of Sendlingsdrif, in association with *Lithops herrei*



Judd Kirkel Welwitch



Gerhard Beukes

Gerhard Beukes



Robin Frandsen





Robin Frandsen

ASCLEPIADACEAE R. Br.

This family is well-represented internationally in many forms. It consists of perennial shrubs or herbs, sometimes deciduous, twining or scrambling or succulent, often with milky sap. Many are eagerly sought after by collectors because of their bizarre flowers and cactus-like forms; and in some countries some are serious weeds. The seedpods comprise of two 'buck horn' follicles which, when ripe, split open longitudinally to release the seeds which are attached to an umbrella-like tuft of hair to be distributed by air currents. These are sometimes trapped in their flight by other shrubs and the seed drops into the shade and beneficial ambience of these 'nurse' plants, which is an ideal place for safe germination. Some of the robust members of the succulent *Quaqua,* for example, having initially benefited from the protection of a nurse plant, long out-lives and replaces it. The transfer of this family to Apocynaceae is not supported here.

THE STAPELIADS:

This group occurs along the length of Africa, adjacent Islands, Madagascar, the Arabian peninsula, Israel, across to India and Sri Lanka, with two species represented as far east as the Irrawaddy Valley in Burma. Because of its great popularity and the fascination of its flowers I have decided to include virtually all taxa of southern Africa in this account.

ANGOLLUMA Munster

Members of this genus are very similar to those of *Orbea.* The main distinguishing factor which separates them is that *Orbea* has its flowers produced from the base of the stem and *Angolluma* produces its flowers from near or at the apex of the stems.

ANGOLLUMA LUGARDII **(N.E. Br.) Plowes** Perhaps this is not a true *Angolluma* but it is more at home in this group than in *Orbea*. The plant forms clumps of stems , which are sometimes large, which are produced from underground rhizomes, appearing in small clumps interconnected by these underground rhizomes. The sub-erect stems are green with light purple spots mainly down the grooves. The flowers are produced in several small inflorescences near the apex of the stem. They are generally yellow with the centre and basal third of the lobes purplish–red, sometimes completely red and sometimes almost completely yellow with just a small section of the tube reddish.

Distribution: Very widely distributed across northern Namibia, into eastern Zimbabwe and patchily across this wide range S to as near as Prieska in the northern Cape.

ANGOLLUMA MISCELLA **(L. Bolus) Plowes** This little species was previously included in *Orbea*, but should not, by virtue of its apical inflorescence, be included there and it fits far more comfortably in *Angolluma*. The plant forms small clumps from underground rhizomes. The stems are usually brownish in habitat, becoming greenish in cultivation. The flowers, borne near the apex of the stem, are small, up to about 17 mm in diameter, on a shortish to long pedicel, up to 18 mm long. The corolla is dark purplish– brown with very prominent reddish outer–lobed corona. Usually only one flower cluster to a stem.

Distribution: Fairly widely distributed across the central Great Karoo to Willowmore in the S across to near Cradock. This is a very cryptic plant and is difficult to locate.

ANGOLLUMA ROGERSII **(L. Bolus) Plowes** This attractive species, which may not be a true *Angolluma*, has unusual inner corona lobes. It is much sought after in collections. It forms large, tightly packed clumps of erect stems which are long-toothed. Their colour is pale green with purple mottling. The flowers are borne upright on long (up to 15 mm) pedicels. The flaring reflexed corolla lobes, are rarely flattened. They are palest yellow, almost white, to very pale green. The lower inside tube of the corolla has long (up to 5 mm) papillae, with a crystalline globular tip. The lobes are finely papillate. The inside corona lobes are long, sometimes shortly branched, teretely twisted processes.

Distribution: Widely, but nevertheless scantily, distributed in eastern Botswana, extreme S Zimbabwe, on the Soutpansberg, across into the Kruger National Park and near Ulundi in KwaZulu-Natal.

ANGOLLUMA SCHWEINFURTHII **(Berger) Plowes** This species should perhaps not be included in *Angolluma*, but it fits more comfortably in *Angolluma* than it does in *Orbea*. This species forms large clumps of sprawling long stems, usually prostrate except at the apices, long-toothed green to mottled. The flowers which are produced near or at the apex



Inge Pehlemann-Brase



Edson Gentile



Tim Peatling



Loukie Viljoen

Inge Pehlemann-Brase

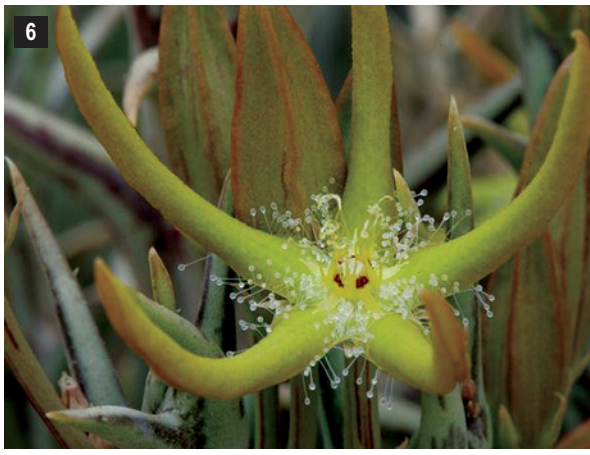


Loukie Viljoen



1 & 2. ***Angolluma lugardii*** (1) in habitat Note the attenuated corolla lobes. (2) In cultivation
3 & 4. ***Angolluma schweinfurthii*** A typical flower showing its position at the apex of the stem (4) From Makusi, Sioma Falls, about 30 km north of Katima Mulilo in Zambia
5 & 6. ***Angolluma rogersii*** (5) in habitat. This species characteristically has a number of blooms on the plant. The flowers are invariably uni-coloured.
(6) Close up of the flower showing the interesting long contorted outer corona lobes and translucent clavate cilia
7. ***Angolluma miscella*** This is a very cryptic, little-known stapeliad which is found on stony ridges and under low karoo bushes

Loukie Viljoen



of the stem are tiny, up to 16 mm in diameter and are produced on very short pedicels. The corolla is yellow and marked with bright reddish spots and irregular transverse bars which become more solid towards the tips. The surface is densely papillate but is not rugose. The corona is yellow with red dots.

Distribution: This is a very widely-spread species occurring in the E Democratic Republic of Congo, W Uganda, central Tanzania, SW Zambia, NE Zimbabwe and into N Botswana.

ANGOLLUMA UBOMBOENSIS **(Verdoorn) Plowes** This very small species, which may not be a true *Angolluma,* forms small clumps, which arise from and are connected by long rhizomes. Rhizomes are occasionally not present. The stems are dark-green to deep grey, sometimes obscurely mottled. The short marginal teeth are conical, tipped with a vestigial leaf or tooth. Flowers are produced on short pedicels near the apex of the stem. They are small, approx. 10-20 mm in diameter. The corolla lobes range from purplish to brick-red, are transversely rugose and papillate. The bifid outer corona lobes range from being connivent or divergent. The inner lobes are incumbent upon the anthers.

***Distribution*:** Widely but sparsely distributed from N Kwa-Zulu Natal, through Swaziland, Mozambique and E Zimbabwe.

AUSTRALLUMA Plowes

This is a monotypic genus. It was excised from the genus *Caralluma* - which is no longer represented in this region. The sole species in *Australluma* is not related to other taxa from the region and it was necessary therefore to place it in its own genus.

AUSTRALLUMA PESCHII **(Nel) Plowes** This species forms small clumps of slender erect stems produced from long underground rhizomes, and are usually difficult to see. They are grey-green, finely mottled with purple. The stems are shallowly grooved with rudimentary vestigial leaves. Flowers are borne on short pedicels near the apex of the stems. The corolla is yellow or greenish-yellow, sometimes with reddish transverse markings, diameter approx. 10-17 mm. The outer corona is reddish-purple and the inner corona is whitish-yellow.

***Distribution*:** *Australluma peschii* occurs N of Windhoek northwards to near the Angola border. It is probably endemic to Namibia.

BAYNESIA Bruyns

This recently discovered monotypic genus occurs in a remote part of NW southern Africa. Its unusual characteristics place it quite separate from other stapeliads of our region and it shares these various characteristics with some central and north African stapeliads.

BAYNESIA LOPHOPHORA **Bruyns** This small, mainly erect species has clumps of stems growing up to 8 cm. The stem surfaces are finely transversely rugulose and minutely papillate. The colour is green to brownish-green. Flowers are glabrous and are borne on a short downwards-pointing pedicel. They are small, up to 4 mm in diameter, and are produced in groups of up to 10 per stem. They are cupular, with dark reddish–purple lobes and with a greenish centre. The inner corona lobes are yellow and the tiny outer lobes are dark purple.

Distribution: At present known only from a limited area of NW Namibia, on the slopes of the Baynes Mountains.

DUVALIA Haw.

This is a widely distributed genus: throughout the southern African sub-region, the Horn of Africa and the SW Arabian peninsula. The plants favour the protective covering of nurse plants. The plants within the various species are very variable and some tend to confuse even the authorities on the genus. The following descriptions are based on the revision of the genus by Dr Ulrich Meve.

DUVALIA ANGUSTILOBA **N.E. Br.** This small, tightly packed, mat–forming species may not b a true *Angolluma*. The short, stubby, nearly spherical stems are generally less than 10 mm long and the marginal teeth are prominent. The colour is green to purplish. The flowers are borne on long prostrate pedicels and the lobes are very narrowly reflexed and are reddish–purple to purple. The outer lobes of the corona are obscurely pentagonal on the top of the raised annulus. The colour is whitish to pinkish and the pale white to creamy inner lobes are dispro-portionally larger than the outer lobes.



Loukie Viljoen



Darrel Plowes

1. ***Angolluma ubomboensis*** This is an attractive small species with uni-coloured flowers
2. ***Australluma peschii*** This species is rarely encountered in the wild and is very uncommon in collections. This plant was originally from the Kaokoveld
3 - 5. ***Baynesia lophophora*** (3) from north western Namibia. Showing the erect nature of this small species

Darrel Plowes





Tim Peatling



Loukie Viljoen

(4) Showing an apical inflorescence of this small, recently discovered stapeliad. Note the green inner tube and the corona with large yellow inner lobes and small purple outer lobes
(5) Showing the flowers clustered on the upper part of the stems on this plant
6. ***Duvalia angustiloba*** in habitat at 'Narouga', Fullerton, Willowmore, E. Cape,

Tim Peatling



Distribution: This species occurs in the Great Karoo between Beaufort West to E of Aberdeen; northwards to Victoria West and S to around Steytlerville.

DUVALIA CAESPITOSA **(Masson) Haw.** This variable species has two subspecies: var. *compacta* (Haw.) Meve and var. *caespitosa*. The stems can vary greatly, with some plants in the same populations producing thick five-angled stems and others having slender four-angled stems. In the subsp. *caespitosa* the stems are green to reddish-green, decumbent, with short conical marginal teeth. Inflores-cences are produced from the lower half of the stems. The flower lobe colours vary from greenish-brown to light red or dark purple. The lobe margins are much reflexed and may be hairless, or with a few short hairs, or with some clavate cilia. The colour of the annulus can vary from pale cream to light purple, and is usually immaculate but is occasionally spotted on a creamy to yellowish background, and is either glabrous or sometimes it has a coat of short hairs. The disc-shaped outer corona is a paler colour than the corolla with yellow to reddish spreading inner lobes. This is a very vari-able species and characteristics that usually separate this species do overlap with other species.

Distribution: The var. *caespitosa* is widespread in the drier Karoo habitats of the E, N and W Cape. The variety *compacta*, which was so called because of usually having more compact stems and flowers with shorter corolla lobes. It occurs in the winter rainfall region, except for a small population in the S Great Karoo.

DUVALIA CORDEROYI **(Hook. f) N.E. Br.** This charming species forms small mats of nearly spherical stems with prominent conical marginal teeth. The inflorescences are produced from near the base of the stem, with a succession of up to four flowers on short pedicels. The flowers vary in colour from yellowish-brown to dark purple, sometimes greenish especially towards the tips. The lobes are imma-culate, sometimes sharply or only narrowly reflexed and have long vibratile cilia along the edges. The large mottled annulus has a yellowish background heavily marked with the colours of the lobes and covered with long slender cilia. The outer corona lobes are circular or pentagonal, and are the same colour as the corolla lobes. The inner corona lobes are spreading, somewhat lighter than the outer corona lobes.

Distribution: Occurs in the central parts of the Great Karoo from W of Beaufort West to W of Aliwal north. Outliers have been found in the central and E Free State.

DUVALIA ELEGANS **(Masson) Haw.** This small clump–forming species is characterised by shiny hairy flowers, a very flat annulus, and a large coronal disc. The stems are green to dull reddish. The flowers are usually darkish–purple and are borne on long pedicels, with broad lobes, but which are sometimes narrowly reflexed. The lobes are covered with dark purple hairs. The outer corona lobes are obscurely pentagonal, covering the centre of the flower, dull–coloured whitish pink to deep purple. Inner lobes are whitish–pink to light red.

Distribution: Found in the S Robertson Karoo, southwards into the Overberg and across to near Heidelberg in the SW Cape.

DUVALIA GRACILIS **Meve** This attractive dwarf species was only discovered in 1984. It has small flowers and nearly globose stems. The flowers are brown to reddish-green and the pentagonal annulus is usually lighter and often slightly mottled; they are borne on a short pedicel. The annulus and the bases of the upper surface of the corolla lobes are very shortly pubescent when viewed through a hand lens.

Distribution Occurs in the Great Karoo.

DUVALIA IMMACULATA **(C.A. Lückh.) M.B. Bayer ex L.C. Leach.** This species is rhizomatous and forms low, decumbent mats. The stems are up to 5 cm in length with prominent marginal teeth; they are green to dark purplish. The flowers are glabrous, up to 32 mm in diameter and are produced on a short pedicel. The lobes are narrowly to quite broadly reflexed, chocolate–brown to dark reddish. They have a prominent pentagonal annulus with a distinctly wavy margin. The outer corona is reddish–yellow with a pale yellow inner corona.

Distribution: An inhabitant of the S Cape, this species has a narrow coastal distribution from near the mouth of the Breede River to the mouth of the Gouritz River where it occurs in arid conditions between coastal fynbos and renosterveld.



Loukie Viljoen



Michael Mllanovic



Dennis de Kock



Darrel Plowes



Tim Peatling



Martin Heigan

1 & 2. ***Duvalia caespitosa* var. *caespitosa*.** (1) A normally dark purple glabrous specimen showing the strongly reflexed corolla lobes (2) A hairier specimen
3. ***D. caespitosa* var. *compacta*.** There seems to be very little separating this variety from var. *caespitosa*. Its green colour is not a consistent characteristic
4 & 5. ***Duvalia corderoyi***. (4) This light-coloured flower clearly displays the vibratile, clavate cilia on the margins of the lobes and the long, silky hairs fringing the annulus (5) in cultivation from north of Cradock, Eastern Cape

6. ***Duvalia elegans***. A specimen with a light–coloured flower showing the large outer corona and the extensive, long cilia on the lobes and sides of the annulus
7. ***Duvalia gracilis*** An attractive plant which is closely allied to *D. modesta*.
8 & 9. ***Duvalia immaculata*.** (8) This species is similar to *D. maculata*, except that its corolla is unmarked. The flower is usually very dark purple but this specimen is a lightish red–brown
(9) This shows the similarity of the flower's shape but its considerably darker colour

Dennis de Kock



Dennis de Kock



Dennis de Kock



Duvalia maculata **N.E. Br.** This dwarf, mat–forming, decumbent species is easily recognised when in flower. The stems are usually up to 4 cm long but can reach up to 6 cm. They are green to purplish. The attractive flowers are borne on a short pedicel. Flowers are glabrous and the corolla is up to 35 mm in diameter, with strongly reflexed, purple to brownish lobes, flattening towards the centre. The annulus is cream to yellow and distinctly dotted or streaked with purple markings. The outer corona is pale yellow and the inner is darkish to pale yellow.

Distribution: Widely and diffusely distributed across the Great Karoo from west of Cradock to SE of Calvinia and from west of Kimberley in the north to S of Beaufort West. In Namibia it is recorded from west of Helmeringhausen and the Karasberg mountain region in Namibia.

Duvalia modesta **N.E. Br.** This dwarf, short–stemmed succulent has very small flowers. The stems are tuberculate, pale–green to pale purple. Flowers are borne on a short pedicel. The strongly–reflexed corolla lobes, which are up to 25 mm in length, are dark purple to greenish–yellow. The obscurely pentagonal outer corona lobes rest on a prominent annulus, and are light pinkish to yellow.

Distribution: Known from W of Beaufort West across to Cradock in the E and northwards to near the Orange River and southwards to near Port Elizabeth.

Duvalia parviflora **N.E. Br.** This is the most dainty and distinctive of the duvalias. The little mat-forming globular stems are almost completely round and are without angles. Their colour is reddish to light green. The flowers are borne on short pedicels and are produced upright from usually the lower half of the stems. The small corolla, up to 16 mm in diameter, is usually creamy to creamy-greenish, sometimes flushed with light purple or brown towards the tips of the lobes, which are generally tightly reflexed. The prominent annulus is pale cream to yellow. The disc-like corona outer lobes are pale greenish yellow to palest purple and the inner corona lobes are pale cream.

Distribution: Occurs across the Little Karoo, where it occurs across almost the entire length of this region and also narrowly into the adjacent Great Karoo.

Duvalia pillansii **N.E. Br.** This very attractive mat–forming species has short, tuberculate stems up to 4 cm long. Their colour is pale green often suffused with purple. The flowers are borne on a short pedicel. The lobes are shiny red to reddish–brown to purple. This colour on the outer lobes grades to a startling white on the central annulus. The lower two thirds of the lobes towards the sinus has long, fine purplish hairs. The outer corona lobes are obscurely pentagonal, cream to pale–yellow. Inner lobes are pale reddish – yellow to pale yellow.

Distribution: Found in limited populations WNW, to N of Port Elizabeth at the lower end of Baviaanskloof in the E Cape.

Duvalia polita **N.E. Br.** *Duvalia polita* is a small clump-forming species which sometimes spreads underground to form separate clumps. The stems are generally decumbent and are armed with short conical marginal teeth. The inflorescences are produced near the base of the stems of up to five flowers produced successively on long pedicels. The shiny corolla is up to 35 mm in diameter. The colour is reddish to dark purple and is sometimes immaculate and sometimes with a yellowish background with longitudinal irregular reddish spots and stripes, either on the corolla lobes or on the annulus.

Distribution: This is a very widely spread species from central and N Namibia, S Angola, Botswana, S Zim-babwe, E and central South Africa, from N of Ixopo in KwaZulu-Natal, northwards. It is also in the Kimberley region. It prefers brackish soil, often where acacia or mopane trees grow.

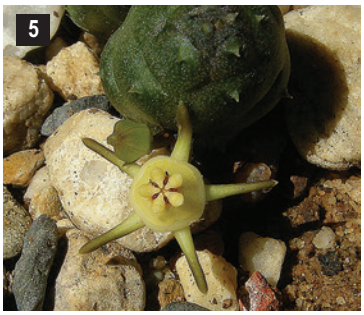
Duvalia pubescens **N.E. Br.** This species is closely related to *D. caespitosa*. It is superficially similar to the very hirsute members of that species but its morphology, distribution and ecology dictates that it should be retained as a full species. It is usually a small plant with the stems tightly packed. The flowers, 20–30 mm in diameter, are borne on pedicels 10–25 mm long, mainly from the lower half of the stems and are pinkish–brown to dark purple. The annulus and the basal half of the lobes are covered with short hairs.


1

Dennis de Kock


2

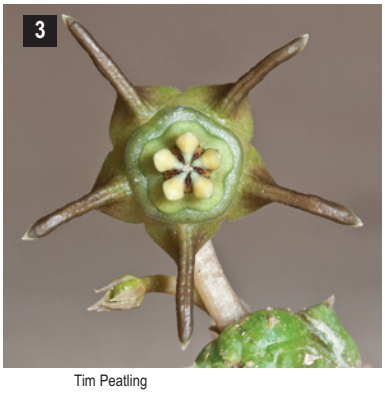
Loukie Viljoen


5

Loukie Viljoen


6

Dennis de Kock


3

Tim Peatling


4

Dennis de Kock


7

Darrel Plowes


8

Darrel Plowes

1 & 2. ***Duvalia maculata*** (1) Characterised by the light–coloured annulus clearly shown in this photograph.
(2) A plant from Helmeringhausen in Namibia
3 & 4. ***Duvalia modesta*** (3) A plant from the junction of the roads from Willowmore and Uniondale. (4) Showing the colour variation of this specimen from the light green of the other specimen (3)
5 - 8. ***Duvalia parviflora*** (5 & 6) in cultivation. (7) 10 km W Ladismith, W. Cape. (8) from near Ladismith, W Cape
9 & 10. ***Duvalia polita*** (9) An immaculate flower of this widespread and colour-variable species (10) Some populations have attractively-marked flowers as shown in this photo
11 & 12. ***Duvalia pubescens*** (11) in cultivation. It differs from *D. vestita in* the shorter corolla lobes which are only partly replicate at their base. (12) A specimen with the lobes less flaring
13. ***Duvalia pillansii*** The annulus and the corona of this species are strikingly light agains the red to dark purple of the outer corolla lobes. Ths picture typifies this distinctive species


9

Loukie Viljoen


10

Loukie Viljoen

John Frew


11

Tim Peatling


12

Loukie Viljoen


13

Distribution: Found mainly in mountainous regions in granite and gneiss, in a narrow band from Aus in Namibia, southwards to the Kamiesberg in the NW Cape, often under small shrubby mesemb bushes.

DUVALIA VESTITA **Meve** Formerly regarded as a subspecies of *D. caespitosa*, its profoundly different ecological requirements and geological separation merits retention at specific level. The plant is small with tightly packed stems. The finely hirsute to heavily pilose annulus is large, prominent and pentagonal in shape. The hairs on the corolla lobes of this species extend adaxially (outwards), unlike those of *D. caespitosa* and *D. pubescens*. The flowers are 20–30 mm in diameter and are pinkish–brown to dark purple.

Distribution: *Duvalia vestita* occurs in the extreme S Cape, S of the Langeberge from west of Bredasdorp to Mossel Bay in the winter rainfall region.

HERMANNSCHWARZIA Plowes

This unusual monotypic taxon had originally been placed in *Pectinaria* and thereafter in *Stapeliopsis*. However its strange mode of flowering from the subterranean lower portion of the stems and its particular mix of floral characters, as well as having unusual three-pointed teeth, prevents its retention in *Stapeliopsis* or any other existing genus, so it was necessary to create a new genus solely to accommodate it.

HERMANSCHWARTZIA EXASPERATA **(Bruyns) Plowes** Although the flowers are produced subterraneously, they do emerge above the surface, whereas those of *Pseudopectinaria pillansii*, generally grow out of sight on the under surface of the stems. The stems are erect, glabrous, greyish to light greenish-brown. The flowers originate underground and on persistent peduncles from the sides of the stem and open out above ground, sometimes with the entire corolla tube underground and generally only the flared, upper lobes appearing above ground. The inside of the corolla tube is covered with white to pinkish spiculate, crystalline papillae and the base of the tube is maroon, as in *Ophionella*.

Distribution: This monotypic species is only known from NE of Calvinia and near Matjiesfontein.

HOODIA Sweet ex Decne.

This large genus is characterised by the stems having numerous rows of spiny tubercles: the spines are either very sharp (as the original large-flowered plants) or else are usually shorter and or weaker in the species with smaller flowers. The species range from very tall (*H. parviflora)*, a species with smaller flowers (up to or more than 2 metres), to short stubby stems (*H. juttae* or *H. dregei*—up to 0.5 metres tall). The flowers are often large and showy but others are sometimes small and densely clustered towards the apices of the plants. Some of the species are highly regarded as having valuable medicinal properties and are unfortunately ruthlessly harvested. As the plants are very slow-growing this poses a real threat to their conservation. Two genera have been brought together under *Hoodia*: the species included under the original genus *Hoodia*, and those species that were previously classified as *Trichocaulon*. Not all botanists are happy with this lumping together and certainly this author would have preferred the retention of *Trichocaulon* as a separate genus but there does not seem to be any sharp dividing line between the two groups that would support that.

HOODIA ALSTONII **(N.E. Br.) Plowes** Formerly *Trichocaulon alstonii*, this species attains the height of about 1 m. The stems are densely armed with pungent brown spines. The inflorescences are small and are produced in small clusters on short pedicels from a small peduncle. Flowers are up to 18 mm in diameter and are produced towards the upper part of the stems, often forming a solid cover. The flowers are campanulate, bright yellow and paler towards the middle. Inner and outer lobes of the corona are yellow.

Distribution: Northern Bushmanland, along the northern loop of the Grootderm of the lower Orange River in Namibia and South Africa and also W of Lüderitz in the Haalenberg mountains.

HOODIA ANNULATA **(N.E. Br.) Plowes** This distinctive species has previously been included as a subspecies of *H. pilifera*. This change of status was unjustified and so is not upheld here. The clustering habit of many stems allows this species to form very large specimens which occasionally could reach 2 m. in diameter. The stems are rarely taller than 0.45 m. and are armed with short, sharp



Darrel Plowes



Loukie Viljoen



Dennis de Kock



Dennis de Kock



Martin Heigan



Gerhard Beukes

1 & 2. ***Duvalia vestita*** (1) in cultivation, a plant from Ashton, S of Montagu, W Cape. (2) Clearly showing the hirsute nature of this small species
3 & 4. ***Hermannschwartzia exasperata*** (3) A plant with flowers with greenish inner corolla lobes and white processes. (4) A plant whose flowers have a pinkish inner corolla tube

5 & 6. ***Hoodia alstonii*** (5) A beautiful specimen in full flower in a valley in the Richtersveld (6) A specimen near Oena in the Richtersveld
7 - 9. ***Hoodia annulata***
(7-8) The plant in habitat north of Willowmore
(9) Close-up of the flowers

Judd Kirkel Welwitch



Judd Kirkel Welwitch



Martin Heigan



spines. Their colour is light greyish brown. The plants bloom in mid-winter and are light reddish to dark purple and cluster thickly, sometimes so thickly as to deform the shape of the flowers, from a few to many flowers together. The surface of the corolla has a ring-like annulus around the tube and is covered with dense papillae. They emit an offensive odour.

Distribution*: Hoodia annulata* inhabits a relatively small area of the Great Karoo southwards of Graaff-Reinet to Willowmore and Steytlerville.

HOODIA BURKEI **N.E. Br.** This species had previously been included in *H. gordonii*. This is not acceptable because the reason for doing so, which was that this species is very variable, is vague and unconvincing. Its distinct characteristics are sufficiently cogent for its retention as a full species. The stems are in excess of 0.3 m, 10 to 14–angled with long pungent spines. The colour is grey-green. The large glabrous flowers are 10 cm in diameter. This large flower size in the original gathering, and the lack of papillae in the centre of the flower, together with slightly taller stems, sets it apart from *H. coleorum* that also occurs in that part of the Karoo.

Distribution: This species was found in the region of the Gamka River N of Prince Albert in the S Great Karoo, but more research is needed to determine if it intergrades with *H. coleorum*.

HOODIA COLEORUM **Plowes** This is a small plant growing up to 0.9 m tall. The stems are up to 6 cm thick, grey-green in colour, with up to about 30 tuberculate ridges with short sharp thorns. The inflorescences have up to 3 yellow, through to brownish-red, campanulate flowers which are sometimes tinged with red in the yellow clones, especially towards the outer edge with a cupular central hollow in which the corona rests. The flowers are densely papillate. It was previously known as *Trichocaulon pillansii*.

Distribution**:** This species occupies a limited range east of Laingsburg and also on the northern side of the Rooiberg in the Little Karoo.

HOODIA CURRORII **(Hook.) Decne.** The stems are about 50 cm tall and usually in small clusters. The teeth are prominently tipped with pungent spines. Stem colour ranges from pale grey to brownish-green. Inflorescences comprise fascicles of up to four flowers. The showy flowers are borne on short pedicels and are about 7—8 cm in diameter. Inside colour is a brownish-yellow and the face is sparsely covered with short soft hairs. The small corona is sunken in a narrow tube in the centre of the corolla.

Distribution**:** *H. currorii* occurs in the coastal fog belt on the W side of Namibia, from Walvis Bay northwards into S Angola.

HOODIA DELAETIANA **(Dinter) Plowes** This rare hoodia reaches a maximum of 0.4 m and forms clumps of up to 0.7 m broad. The stems are generally sprawling but may be erect. They are sharply spined. The large flowers are up to 20 mm in diameter and are cupular in shape. They are brownish yellow to yellow in colour. They are generally glabrous but may have a few scattered papillae.

Distribution: This species is very localised and confined to the Sperrgebiet in the Klinghardt Mountains SE of Lüderitz, where it is fairly common.

HOODIA DREGEI **N.E. Br.** This rare species is a small plant, up to 25 cm but sometimes taller, with stems up to 60 mm thick. The green-coloured stems have prominent tubercles tipped with a soft short spine. Up to 5 flowers are borne near the tip of the stems. The flowers are up to 45 mm in diameter, on a pedicel, up to 11 mm long. The flowers vary in colour from yellow to maroon and are densely covered on the face with soft white hair-like bristles.

Distribution: This rare species inhabits a small range between Beaufort West, Merweville and Prince Albert.

HOODIA FLAVA **(N.E. Br.)** Plowes This small plant has stems 15 to 30 cm long. The greyish to brownish-green stems are stubby, with up to 30 ridges of softish spine-tipped teeth. The inflorescences produce up to 3 flowers on very short pedicels clustered usually on the upper half of the stems. Their colour is yellow tinged with light to darker brown towards the outer edges. Plants from the Great Karas Mountains have reddish-brown flowers. The corona, with its forceps-like outer lobes, is prominently yellow.



Darrel Plowes



Gerhard Beukes



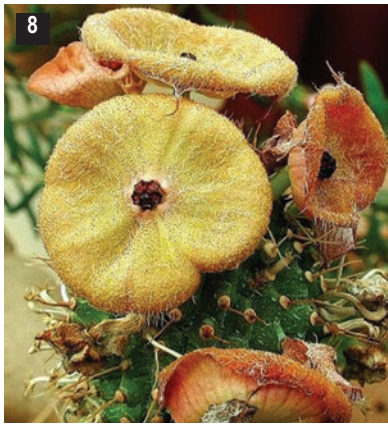
Judd Kirkel



Loukie Viljoen



Darrel Plowes

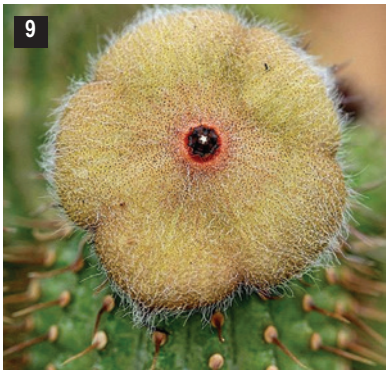


Loukie Viljoen

1. ***Hoodia burkei*** in habitat 25km SW of Rietbult, near Merweville in the Great Karoo
2 & 3. ***Hoodia coleorum*** (2) Showing the bright yellow of the flowers and the purplish-red of their underside (3) A flower showing the papillate inner surface and reddish tinge of the margins
4 & 5. ***Hoodia currorii*** (4) The plant in habitat (5) in habitat near Henties Bay, Namibia
6 & 7. ***Hoodia delaetiana*** (6) This specimen was photographed in the Klinghardt Mountains, Namibia. (7) In cultivation from a plant collected in the Klinghardt Mountains
8 & 9. ***Hoodia dregei*** Two clones of this rare and attractive small species from near Merweville
10 & 11. ***Hoodia flava*** (10) The plant in habitat 65km west of Beaufort West. (11) Close up of the flower showing the unusual but characteristic outer corona lobes



Darrel Plowes



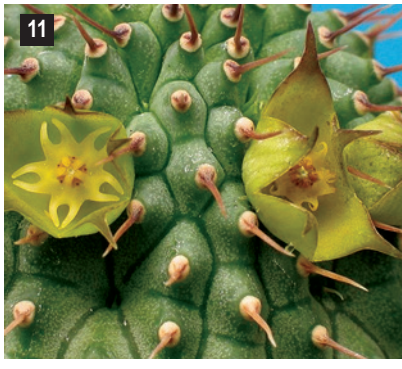
Loukie Viljoen

Darrel Plowes





Jacques van Thiel



Distribution: In Namibia it is recorded from the eastern and S parts of the Great Karas Mountains. In South Africa it inhabits the Great Karoo and Bushmanland from Calvinia in the W to near De Aar in the E and southwards to the Swartberg Mountains.

HOODIA GIBBOSA **Nel** This compact cushion-like plant grows up to about 30 cm. The short, stout stems are about 14–angled and are armed with short sharp spines. The flowers are single or in fascicles of up to 4 at the apex of the stems. They are up to about 80 mm in diameter on a short pedicel. Their colour is purple and they are covered with short stiff purple hairs.

Distribution: This species inhabits granite hills on the edge of the Namib Desert east of Swakopmund in Namibia, but apparently does not grow on the plains.

HOODIA GORDONII **(Masson) Sweet ex Decne.** This is a well-known hoodia, sometimes forming populations of many plants in a small area. The stems are up to one metre tall; their colour is greenish to grey brown. The tuberculate teeth are prominent and are armed with a pungent thorn. The inflorescence, produced on the upper part of the stem, produces up to four flowers in succession on short pedicels. The flowers are showy, rotate and pale flesh-coloured to reddish, or even deep velvety-red in some Namibian plants. The corona is blackish.

Distribution: This easily recognised and iconic plant is widely distributed from north west of Windhoek in Namibia, eastwards to near Kimberley, west to the Tanqua Karoo and the Biedouw Valley and as far S to N of the Swartberg Mountains in the S Cape, but is not found near the coast.

HOODIA GRANDIS **(N.E. Br.) Plowes** This is one of the former '*Trichocaulon*' species. It is a few, to many, stemmed plant, one of the tallest of the trichocaulons. The stems have up to 30 rows of thorn-tipped obtuse-angled marginal teeth. They are grey-green in colour, up to 0.6 m tall and up to 60 mm thick. Each inflorescence produces up to 3 flowers. These are densely papillate, yellow to reddish to purplish in colour and up to about 30 mm in diameter.

Distribution: Occurs in the northern Little Karoo and extralimitally in the Great Karoo, E of Laingsburg to near Prince Albert and northwards into the Moordenaars Karoo in the region of Merweville.

HOODIA JUTTAE **Dinter** This is a small many-stemmed plant growing up to about 0.3 m tall. The stems are up to 18-angled with prominent tuberculate teeth, sharply tipped with long pungent spines. Their colour is pale green to whitish-green. The inflorescence comprises up to 4 flowers, opening successively. The shallow cupular glabrous corolla colour ranges from brownish-pink to yellowish-pink, with characteristic paler radial streaks.

Distribution: Recorded only from the vicinity of the Karasberg mountains in S Namibia.













Hoodia gordonii Above: A plant from the Tanqua Karoo *Photo Elizabeth Frandsen.*
Left: Colour variations; Far left: two pictures of flowers from near Rosh Pinah in southern Namibia *Photos Gerhard Beukes.* Left: flowers of different colours from three other clones *Photos Darrel Plowes*



Darrel Plowes



Darrel Plowes



Darrel Plowes

Darrel Plowes



1. ***Hoodia gibbosa*** This rare species in habitat east of Swakopmund
2 & 3. ***Hoodia grandis*** (2) In cultivation from Keurfontein,
2 km S of Laingsburg. (3) In cultivation from 20 km S of Laingsburg
4 & 5. ***Hoodia juttae*** (4) In habitat from 25 km N of Grünau, S Namibia.
(5) With lighter flowers from the same area
6. ***Hoodia longispina*** (*gordonii*) This plant belongs to a group incorrectly included in *H. gordonii* but which had previously validly been classified as *H. longispina* Plowes.
Type plant in habitat 5 km S of Witputs, Namibia.



Darrel Plowes

Darrel Plowes



Hoodia langii **Obermeier & Letty** This species differs from *H. gordonii* in having hairy flowers, in the shape of its corona, and in its much shorter and slimmer growth. Stems reach up to 40 cm and are up to 35 mm in diameter. Flowers are usually solitary and fairly small, up to 5 cm in diameter. They are shallow saucer shaped, with innumerable hair-tipped papillae up to 3 mm in length. Their colour is pale pink, suffused with brown.

Distribution: This restricted species occurs on the border between Namibia and the Northern Cape Province in the vicinity of Rietfontein, S of the Kalahari Gemsbok Park.



Hoodia langii
This rare plant in cultivation showing the large hairy flowers, from a plant collected at Rietvlei, SE of Klipkolk, near Aroab, Namibia
Photo Darrel Plowes

Hoodia lugardii **N.E. Br.** This large species grows up to 1 m and about 60 mm thick. The conspicuous plants have 10 or more erect pale grey stems with as many as 20 ranks of thorn-tipped teeth. Flowers are pubescent and saucer-shaped with a slightly raised 'knobbly' annulus around the corona, always with a long tail-like tip to the corolla lobes. They are produced at or near the apex of the stem on a short pedicel. Their colour is brick-red to pale pink. They flower at the height of the dry season in August/September, and grow in areas with low summer rainfall, unlike *H. currorii*, with which they were incorrectly linked, which occurs in the Namib coastal fog belt in the winter rainfall region.

Distribution: *H. lugardii* occurs in E and central Botswana, W Limpopo Province, to as far as near Beit Bridge, and SW Zimbabwe.

Hoodia macrantha **Dinter** This is a large plant with often untidy sprawling or sub-erect stems which have up to 25 angles with prominent marginal teeth each armed with a pungent spine. Its height is up to 1 m, and sometimes larger in diameter. The stem colour is grey to brownish-green. The nearly flat glabrous spectacular flowers are up to 180 mm in diameter and are brick-red to pale pink.

Distribution: Endemic to Namibia where it grows in the region of Karibib and Usakos and near the base of the Erongo Mountains, down to Khorixas and across to Sesfontein, and inland to where *H currori* is found.

Hoodia officinalis **(N.E. Br.) Plowes** This species was originally described as *Trichocaulon officinale*. It forms clumps of erect or sprawling stems up to 50 cm in height. Their colour is yellowish-brown to light green. The tubercles are alternately densely packed and tipped with a long, pungent thorn. Inflorescences are produced with up to three flowers on a short pedicel. The flowers are small, up to 20 mm in diameter, yellowish-brown to deep reddish-brown and produced on the upper parts of the stems. The face is very finely papillate, almost pubescent at times. The corona is not sunken in the corolla and the outer corona is dark reddish-purple and the inner is yellow to reddish.

Distribution: Widespread from S of Windhoek, along the higher areas, to S of Upington to Prieska to S of Kimberley.

Hoodia parviflora **N.E. Br.** This is the tallest of the hoodias and attains the height of more than two metres. The stems are pinkish to bluish-green and are more robust than any of the other species. The tubercle teeth are prominent and armed with pungent thorns. The flowers are small: up to 56 mm in diameter, funnel-shaped, yellow through brownish-orange to brick red. The mouth of the corolla is raised into five small mounds, made prominent by being of a lighter colour.

Distribution: Occurs in a limited area of NW Namibia and into Angola in the Kunene River valley.

Len Petzer





Tim Peatling



Darrel Plowes



Loukie Viljoen



Darrel Plowes



Darrel Plowes

1 - 3. ***Hoodia lugardii*** (1) In habitat in the Tuli Block in W Botswana of this large sprawling species with large flowers. Note the long 'tails' at the tips of the lobes. (2) In habitat at Xhumo, 20 km NW of Lake Xau, Botswana (3) The species in cultivation
4 & 5. ***Hoodia macrantha*** (4) The species in habitat south of the Erongo Mountains, central Namibia showing its sprawling habit. (5) Showing the large shallowly campanulate flowers of this striking species

6 & 7. ***Hoodia officinalis*** (6) In culltivation with a green stem, from the Tiras Mountains, 65 km N of Aus, Namibia
(7) Flowering plant in cultivation showing the characteristic yellow corolla tube and prominent corona
8 - 10. ***Hoodia parviflora*** (8) The tallest of the hoodias. A plant in habitat in Kaokoland
(9) A hairy variant with a more cupular corolla, from a plant from Okombathi, NW Namibia. (10) Close-up of a specimen in habitat

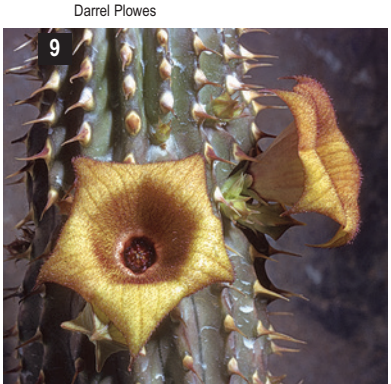
Inge Pehlemann-Brase



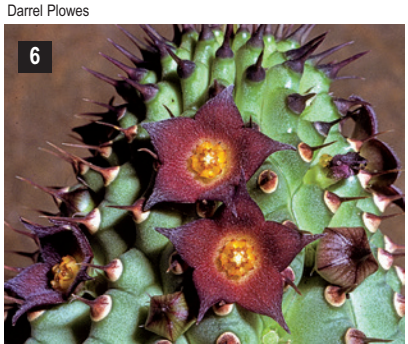
Inge Pehlemann-Brase



Darrel Plowes



Darrel Plowes



***Hoodia pedicellata* (Schinz) Plowes** This is a small, sprawling species which inhabits dolerite dykes in the most arid regions in the Namib Desert. The stems, which are erect when young, sprawl laterally to sub-erectly in age. They are prominently tuberculate in ranks of up to 20, armed with a short pungent spine, soon lost to the harsh elements, which is when they resemble blackish maize cobs. The inflorescence produces up to 4 glabrous flowers in short pedicels and are up to 14 mm in diameter. Colours are dark purple to light brown.

Distribution: Confined to the coastal strip of Namibia within a maximum of 100 km from the sea in the S, close to the coast in the north, from S of Walvis Bay to the Angola border.

***Hoodia pilifera* (L.f.) Plowes** This distinctive species was previously know as *Trichocaulon piliferum*. The stems are robust and the plant forms clumps with many stems up to 1 m wide and up to 0.4 m tall. The densely packed tubercles are tipped by long stiff pungent spine which often distort the flowers which have a short pedicel. The colour is greyish-green. The inflorescence produces up to three mal-odorous flowers on very short pedicels on the upper half of the stems, often many at a time. Flowers are usually deep brick-red to almost purple-black. The surface is noticeably papillate, except in the tube, with short stiff bristles.

Distribution: *Hoodia pilifera* inhabits the Little Karoo from Uniondale in the E to Montagu in the W.

***Hoodia ruschii* Dinter** This rare species inhabits a very arid region. It forms many stems and is erect to sub-erect growing to a height of about 0.5 cm. The brownish to grey-green stems are stubby with up to 25 angles, with tubercles armed with a pungent thorn and is up to 60 mm thick. The flowers are campanulate, densely papillate with a short hair on each papilla. The colour is dark reddish-purple.

Distribution: Occurs only on the fascinating granite of the Tiras Mountains in SW Namibia, along the other various other plants, endemic only to this range.

***Hoodia triebneri* Hans Schuldt**. This is a very small species that was described in 1933 in the obscure journal Desert Life, but the species name was the same as that of the former *Trichocaulon triebneri* so, when the spiny members of that genus were merged into *Hoodia*, *T. triebneri* was renamed as *H. foetida*. No locality was given for the original *H. triebneri*, and it has never been rediscovered. It forms a small erect shrub barely 25 cm tall of stubby stems. The flowers are borne on a short pedicel. The flowers, which are very foul-smelling, are up to 14 mm in diameter, are campanulate and are dark red in colour. The name *triebneri* is been shown to be illegitimate and the plant's name will be reverting to *H. foetida.*

Distribution: Occurs north west of Windhoek along the Swakop River from near Karibib to near Okahandja.

Huernia R. Br.

This large genus of exceptionally attractive plants was founded by Robert Brown who named it after Justus Heurnius. The published name was spelt incorrectly and should have been '*Heurnia*' but has remained the original '*Huernia*'. The genus is characterised by the outer corona lobes lying flat on the floor of the corolla tube, and often with there being a small point in the junction of each pair of corolla lobes. The erect stems are glabrous, finger-sized or smaller, and usually square or 5—angled, with sharply pointed teeth up the corners. The flowers are produced in small clusters at the base of the stems.

***Huernia barbata* (Masson) Haw.** This distinctive species is a dwarf succulent with many stems occasionally forming clumps of in excess of 25 cm in diameter. The stems are 4–5–angled, usually greenish-grey and up to 8 cm in length. The inflorescence is produced on a short peduncle, producing up to 5 flowers in succession. Flowers are produced on pedicels up to 10 mm long. They are tubular with triangular long-tipped spreading lobes, creamy to whitish-yellow in colour and with reddish to purplish linear spots and concentric lines in the base of the corolla tube. The interior of the tube, except for the lower parts, has long bristles, becoming shorter on the lobes.

Huernia barbata Left: in habitat north east of Willowmore *Photo Tim Peatling.* Right: in cultivation *Photo Martin Heigan*





Darrel Plowes



Dawie Human



Unknown



Loukie Viljoen



Darrel Plowes



Inge Pehlemann-Brase

Darrel Plowes

1 - 3. ***Hoodia pedicellata*** (1) 15 km E of Swakopmund, Namibia, (2) In habitat N of Swakopmund. (3) In cultivation
4 & 5. ***Hoodia pilifera*** Two beautiful specimens of this striking species in cultivation
6 & 7. ***Hoodia ruschii*** (6) In habitat in the Tiras Mountains, 40km SW of Helmerinhausen, Namibia. (7) From the same locality in cultivation

8 & 9. ***Hoodia triebneri*** (8) A plant flowering in cultivation. (9) A plant from the Swakop River region showing the pungent thorns and the campanulate flowers. This species is correctly being re-assigned to *H. foetida*

Jacques van Thiel



Loukie Viljoen





Distribution: This is a widespread species occurring from NW of Calvinia, southwards through the Ceres Karoo into the Little Karoo, westwards to near Grahamstown, and northwards to E Free State and across to E of Upington.

HUERNIA BAYERI **Leach** This species is closely allied to *H. thuretii* var. *primulina*. It differs in having long simple straight hairs arising from small conical papillae in the mouth, in being maroon at the base of the tube. This factor, combined with the open campanulate corolla tube and long, subulate and divergent outer corona lobes, is diagnostic. The plant is tufted with stems up to 60 mm tall. The flowers are produced successively on longish pedicels from a small peduncle. The corolla is cream to pale yellowish-green. The surface is almost smooth.

Distribution: Occurs in the lower Baviaanskloof vicinity of the Kougas and Gamtoos rivers W of Port Elizabeth and near Uitenhage.

HUERNIA BLYDERIVIERENSIS **(Leach) Bruyns** This species is closely related to *H. quinta*. It is a dwarf plant with the grey-green, purple-mottled 4–5–angled stems forming dense large clumps up to 30 cm in diameter and up to 15 cm tall. Like *H. quinta,* the corolla is densely papillate with small conical papillae tipped with a short bristle. It is creamy white with short reddish striations and linear spots, sometimes over the entire corolla face and sometimes only in the tube. The little corona is prominently yellow to orange.

Distribution: The distinctive plant is found on dolomite ledges and shallow soils between rocks along the Blyde River on the S sides of the Olifants River in Mpumalanga Province.

HUERNIA BREVIROSTRIS **N.E. Br.** This distinctive but very variable species has, along with other good species and with little or no justification, been transferred as synonymous with *H. thuretii*. This present work does not support that transfer. The plant forms large clumps of densely packed dull darkish green to purplish 4–5– angled stems up to about 5 cm tall. The inflorescence is produced on pedicels up to 25 mm long from a short peduncle from the base of young stems. The flowers are up to 40 mm in diameter, with an indistinct annulus and a deep tube. Colours are pale cream to yellow with linear pale to dark reddish spots which coalesce into lines in the inside of the corolla tube. The corona is a deep reddish-purple. Two additional subspecies are recognised: subsp. *intermedia* (N.E. Br) Leach and subsp. *baviaana* Bayliss with pale markings from the vicinity of Baviaanskloof. The former is distinguished by its almost complete absence of corolla markings.



Huernia brevirostris in cultivation *Photo Darrel Plowes*



Huernia brevirostris from west of Willowmore, E. Cape *Photo Tim Peatling*



Huernia brevirostris **subsp. *baviaana*** in cultivation *Photo Tim Peatling*



Huernia brevirostris **subsp. *baviaana*** in cultivation a plant from Baviaanspoort, 100km NW of Humansdorp *Photo Tim Peatling*

Distribution: This species is concentrated mainly with the Sundays River valley and extending SW towards Willowmore in the Eastern Cape Province.

HUERNIA CAMPANULATA **(Masson) Haw.** This is another taxon that has been placed in synonymy with insufficient reason. The stems of this distinctive species are 4–5–angled and are up to 5 cm tall. They are dull green to sometimes mottled with purple. They form tight clumps with the inflorescence produced on a short peduncle from the base of the younger stems. Flowers are inclined upwards on a short pedicel, up to 15 mm long, and are campanulate with the lobe tips usually erect, and the base of the tube sometimes slightly bulbous. Their colour is whitish to pale yellow, finely speckled and with small to large irregular purplish to



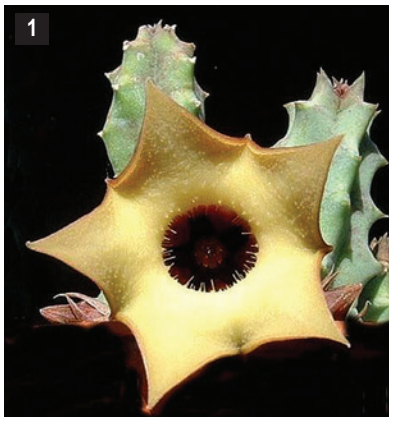
Nigel Dennis



Darrel Plowes



Loukie Viljoen



John Frew



Darrel Plowes

1 - 3. ***Huernia bayeri*** (1) Clearly showing the long hairs in the throat of the tube. (2) The plant in cultivation, a plant from 5km W of Patensie in the eastern Cape (3) In cultivation
4 & 5. ***Huernia brevirostris* subsp. *intermedia*** (4) in cultivation (5) A plant from Paardekraal, 58km E of Cradock, E. Cape
6 - 8. ***Huernia blyderivierensis*** (6) in cultivation, flowers with no markings on the outer corolla lobes. (7) A plant with the flowers more yellow. (8) A flower with a few markings on the outer lobes. Some clones have many more markings than these illustrated
9 - 11. ***Huernia campanulata*** (9 & 10) in cultivation. (11) with semi-opened flowers



Loukie Viljoen

Loukie Viljoen



Loukie Viljoen



Loukie Viljoen



Loukie Viljoen



Loukie Viljoen



red spots. The base of the inner tube of the corolla is free of cilia, with the rest of the tube covered with long inward-pointing cilia, decreasing in length at the edge of the tube.

Distribution: Occurs east of Oudtshoorn along the Olifants and Kamanassie rivers in the E Cape and in the catchment area of the Gouritz River.

HUERNIA CLAVIGERA **(Jacq.) Haw.** This is a loosely clump-forming species, with 4–5–angled stems. The stems are up to 6 cm tall and 20 mm thick. The flowers are inclined upwards from short pedicels which are produced on a peduncle at the base of the stem. Flowers are tubular, wider at the top, then broadening outwards with short intermediate points between the elongated deltoid corolla lobes. The flowers are pale cream to yellowish-cream, speckled with fine purple dots and spots with long purplish to reddish clavate hairs in the throat of the tube which become very short on the lobes.

Distribution: The main distribution area is concentrated in the Montagu to Laingsburg area, but extending S to Mossel Bay, with a large form near the Vanrhyns Pass that will probably be described as a new species.

HUERNIA ERECTILOBA **Leach & Lavranos** This species forms clumps of up to 30 cm in diameter. The stems are up to 5 cm long and about 10 mm thick, with prominent teeth. Their colour is grey-green to buff with reddish markings. The bicampanulate flowers of this species are up to 30 mm in diameter, with a prominent annulus and erect lobes. The flower markings are very variable on a pale cream base with heavy reddish markings that are in the form of large dots which are sometimes coalesced into sub-linear markings. The annulus is usually more heavily marked than the lobes and is sometimes almost entirely red. The inside of the tube bears a ring of clavate hairs.

Distribution: This rare species is endemic to central Mozambique on the dramatic granite inselbergs in Zambezia and Nampula provinces of N Mozambique

HUERNIA GUTTATA **(Masson) Haw.** This clump-forming species has stems up to 7 cm tall and up to 15 mm thick. The stems are grey-green sometimes mottled with purple. Two subspecies are recognised, subsp. *guttata* and subsp. *calitzdorpensis.* The inflorescence is produced on pedicels of up to 30 mm long from a short peduncle. The flowers tend to face upwards and have a prominent annulus. Their colour is creamy or slightly buffy, with small to large red dots which coalesce into larger patches, particularly on the annulus. The inside upper two thirds of the tubes have long clavate hairs and the base near the corona is shortly hirsute. subsp. *calitzdorpensis* is very variable but is distinguished from the nominate variety in having larger flowers, with the annulus varying from being finely spotted to almost solid dark maroon.

Distribution The subspecies *gutatta* is recorded from N of Port Elizabeth, near to Somerset East, in the Zuurberg and across to Steytlerville. Subsp. *calitzdorpensis* is recorded from the region of Ladismith to near Calitzdorp in the Little Karoo.

HUERNIA HALLII **E. & B.M. Lamb** This small species forms dense, often very large, clumps of pale-green stems with deltoid sharp marginal teeth. The creamy flowers, sometimes tinged with pale red, are borne on a short pedicel. They up to 35 mm in diameter, have a short tube, and are marked with light red to purple transverse stripes or transverse elongated dots. The outer corona is yellow to dark red; inner lobes are yellow.

Distribution: This species is endemic to Namibia where it is known from two disjunct localities: the Huib Plateau, south east of Aus, northwards towards Witputs, and in the Karas Mountains north of Grünau.

HUERNIA HISLOPII **Turrill** This species favours cracks and crevices in granite, where it fills the spaces with many erect to sub-erect stems up to 15 cm tall. In deeper soil it forms large clumps. The grey-green to brownish stems are 5–angled and strongly toothed. The campanulate flowers have flattened lobes up to 55 mm in diameter, often with long tips. Colour is pale cream with irregular, sometimes fine pinkish spots. Two subspecies are recognised: *hislopii* and *robusta*. The subspecies *robusta* rarely forms clumps larger than 15 cm across, whereas subsp. *hislopii* is known to form clumps of up to 1 m across. The markings on the corolla are generally much heavier than subsp. *hislopii* which gives the flowers a much more pinkish appearance, and it has a longer straight tube.



Unknown



Tim Peatling



Loukie Viljoen



Loukie Viljoen



Loukie Viljoen



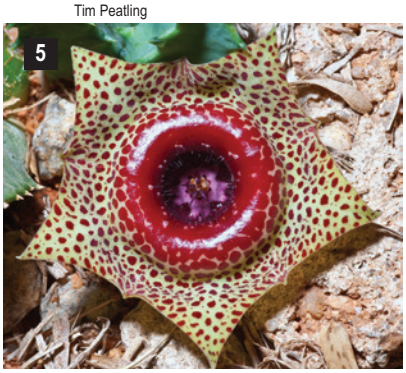
Darrel Plowes

1 & 2. ***Huernia clavigera*** In cultivation
3 & 4. ***Huernia erectiloba*** This Mozambique rarity in cultivation
5 - 7. ***Huernia guttata* subsp. *guttata*** (5) from near Suurberg, eastern Cape (6) In cultivation (7) In habitat from near Kommadagga, N of Paterson, E Cape
8. ***H. guttata* subsp. *calitzdorpensis*** A plant from the Calitzdorp Dam in cultivation
9 & 10. ***Huernia hallii*** in cultivation
11 & 12. ***Huernia hislopii***
(11) The plant in cultivation
(12) In habitat about 20 km south of Mutare, Zimbabwe
13. ***H.* subsp. *robusta*** in cultivation

Robin Frandsen



Tim Peatling



Darrel Plowes



Loukie Viljoen



Loukie Viljoen



Darrel Plowes



Darrel Plowes



Distribution: Occurs in Zimbabwe, Mozambique and Botswana: subsp. *hislopii* is widespread from N of Harare and eastwards to Nyanga, to S of Mutare and eastwards to the Matopos. It occurs into Mozambique west of Nyanga and W of Mutare towards Chimoio. The subspecies *robusta* is confined to the NW regions of Zimbabwe and across into adjacent Botswana.

Huernia humilis **(Masson) Haw**. This striking species, despite its name 'the humble huernia' has very attractive flowers. The square stems are up to 4 cm long and are erect and stout. Their colour is greenish-grey sometimes marked with purple. The inflorescence is 1–5 flowers forming successively on pedicels up to 18 mm long, which arise from a short peduncle near the base of the stem. The flowers are up to 40 mm in diameter. Their colour is creamy yellow to brighter yellow and heavily to lightly marked with reddish irregular spots on the lobes. The annulus is very prominent and very heavily marked to totally red-coloured. The tube is frequently strongly pentagonal.

Distribution: The species has a wide distribution in the central Great Karoo from near De Aar in the N to southwards to the N Swartberg, to S of Calvinia in the district of Middelpos.

Huernia hystrix **(Hook.f.) N.E. Br.** This charming little plant is well-named the 'hedgehog huernia' because of its densely papillate inside corolla lobes. It has pale-green stems up to 7 cm in length often with hard sharp teeth. The inflorescence is usually single to a stem with up to 3 upward-facing flowers. The creamy-yellow flowers are up to 50 mm in diameter with a fairly shallow tube and a flat limb. The inside of the tube is smooth and has red striae: the corolla lobes are covered with long conical processes and are marked with red irregular spots which tend to coalesce into lateral striae nearer the centre of the flower. The subspecies *parvula,* has smaller flowers and has considerably less papillae than subsp. *hystrix*, with various differences in the form of the papillae and the corona. It will probably have to be raised to the rank of full species.

Distribution: Subspecies *hystrix* has a very wide distribution from near Mthatha in the former Transkei northwards through Swaziland into the west-central regions of Mpumalanga and Limpopo provinces in association with acacias. The subspecies *parvula* is confined to SE KwaZulu-Natal.

Huernia ingeae **Lavranos** This species has a slight resemblance to *H. barbata*. It is a very small plant with tightly-clumped, light green, purple mottled stems, up to 35 mm tall and up to 11 mm thick. The inflorescence is produced from a short peduncle at the base of the stems and produces up to 3 flowers in short succession. The campanulate flowers (very rarely bicampanulate), are up to 11 mm long and up to 12 mm in diameter. The inside colour of the flower is creamy yellow and the surface is covered with red papillae each subtended with a long red bristle.

Distribution: This species is a native of arid Bushmanland, from E of Springbok to near Pofadder. It is apparently endemic to South Africa and seems to favours quartzitic outcrops, often on ridges and hill-tops.

Huernia insigniflora **C.A. Maass** This striking species is closely allied to *H. zebrina*, both species have a prominent annulus around the corolla tube. The short stubby stems are erect and up to 4 cm long, pale green mottled with purple. The inflorescence is produced on a short peduncle which produces up to 3 flowers successively. These are up to 40 mm in diameter with the colour of the lobes cream to creamy yellow with a prominent annulus which is usually plain brick- to bright-red. The most dramatic flowers forms are those that have unmarked cream-coloured lobes and a bright red annulus, but other plants are variably plain to heavily marked with red stripes on their lobes and annulus.

Distribution: This species is confined to the western edge of the Mpumalanga and Limpopo Drakensberg from N of Mbombela (Nelspruit) to E of Tzaneen.

Huernia kennedyana **Lavranos** (*See P. 132 for the illustrations*) The 8—angled stems of this delightful rare miniature huernia. The tubercles appear to be tessellate. The stems are tightly packed, small clumps and are almost spherical. The flowers are campanulate with the outside minutely papillate. The insides are pale yellow with transverse purple markings which are wider and



Darrel Plowes



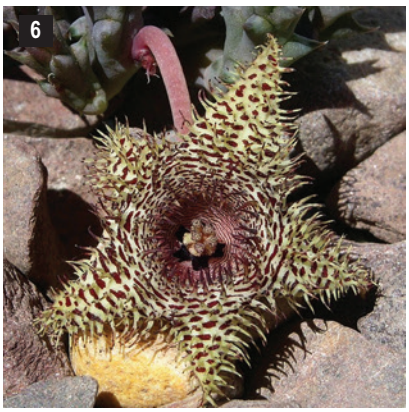
Loukie Viljoen



Loukie Viljoen



Loukie Viljoen



Darrel Plowes

1 - 3. ***Huernia humilis*** (1) in habitat 50 km ESE Richmond, N Cape
(2 & 3) in cultivation
4 & 5. ***Huernia hystrix*** (4) in cultivation
(5) In cultivation from near Wartburg, KZN-Natal
6. ***H. hystrix*** **subsp. *parvula*** in cultivation
7 & 8. ***Huernia insigniflora*** (7) in cultivation
(8) from Woodbush, NW of Tzaneen, Limpopo Prov.
9. ***Huernia ingeae*** in cultivation



Loukie Viljoen



Darrel Plowes

Darrel Plowes









Huernia kennedyana
in cultivation. Above: showing the almost globose stems
Left :Clearly showing the unique processes on the inside face of the flower
Photos Loukie Viljoen

longer towards the apex and thinner and shorter towards the corona. The upper half of the surface is densely covered with pale papillae, tipped with one or more dark spots. The reddish 5-lobed outer corona is bifid and the inner is yellowish.

Distribution: The species has a very localised distribution. It occurs in the E Cape from S of Cradock to about 50km NW of the town.

HUERNIA KIRKII **N.E. Br.** This handsome species has boldly spotted flowers. The stems, which are brownish to greyish-green are often brightly mottled with purple, are erect and up to 15 cm long. Their teeth are prominent and quite sharp. The inflorescence is produced on a short peduncle with up to 5 successively produced flowers on pedicels up to 25 mm long. The flowers are distinctly bi-campanulate with the inside colour creamy grey to creamy yellow, with fine to coarse irregular purple to reddish spots, coalescing towards the base of the tube into a solid colour. The surface is papillate except in the tube.
Distribution: This species is recorded from N KwaZulu-Natal, southern Swaziland to the southern Kruger National Park. The main population seems to be SE of Polokwane, with outliers in SE Zimbabwe and narrowly into W Mozambique.

HUERNIA LEACHII **Lavranos** This is a trailing species, which is found at the bases of aloes and euphorbias or in sedge tussocks on granite whaleback hills and outcrops. The thin cylindric stems can be up to +1 m long but are usually much shorter; they taper towards the tip. Their colour is pale green to reddish. One to 6 flowers are produced on pedicels of up to 4 cm long in succession from a short to long peduncle. The delicate flowers are campanulate with a flaring limb, creamy white to pale creamy yellow with concentric unbroken to concentric broken stripes of dark purple to red mainly near the base of the stem but also anywhere along the stem towards the apex. The corolla is up to 25 mm in diameter.

Distribution: This is an endemic of Mozambique with an outlier population S of Lake Malawi. It is found E of Mutare near Chimoio in central Mozambique and about 125 km N of this point.

HUERNIA LEVYI **Obermeier** A loose-clump forming species, up to 30 cm in diameter, with erect stems up to 10 cm tall. The stems are green suffused with purple, to purple. The inflorescence is on a short peduncle on the lower part of the stem which produces up to 3 flowers on short pedicels. The campanulate flowers have the longest of any known huernia, up to 40 mm long and up to 25 mm wide at the top. The inside and outside is papillate with the inside cream-coloured with pink irregular spots, grading to solid pink at the base of the tube.

Distribution: The species occurs mainly around Hwange in NW Zimbabwe and near the Great Dyke. In S Botswana at Pandamatenga, and also in the Kafue National Park in Zambia.

HUERNIA LOESENERIANA **Schltr.** This species can form dense mats of up to 1 m in diameter, but usually it occupies rock cracks. The grey-green to brown erect stems are up to 7 cm tall and up to 15 mm thick. The inflorescence of up to 3 flowers is produced on a small peduncle on the lower half of the stem, with the longish pedicels generally holding the flowers horizontal or facing slightly downwards. The flowers are up to 25 mm in diameter, are creamy yellow in



Darrel Plowes



Loukie Viljoen



Loukie Viljoen



Darrel Plowes



Darrel Plowes



Loukie Viljoen

Darrel Plowes

1 - 3. ***Huernia kirkii*** (1) A plant from the Blyde River Canyon (2 & 3) in cultivation
4. ***Huernia levyi*** in cultivation**.** a plant from Shabatwa River, Kafue National Park, Zambia
5 & 6. ***Huernia leachii*** in habitat. (6) In cultivation
7 - 9. ***Huernia loesneriana*** (7) in habitat near Middelburg, Mpumalanga. (8 & 9) Showing the plant in cutivation

Judd Kirkel Welwitch



Loukie Viljoen





colour, densely papillate with irregular purplish to reddish dots which usually coalesce into linear concentric stripes.

Distribution: This is a common species found along the quartzitic hills and ridges of the Witwatersrand and Magaliesberg, from W of Pretoria eastwards to eMalahleni (Witbank), Waterval Boven, near Dullstroom, N to near Mokopane (Potgietersrust), and S of Johannesburg and SW to near Parys in the Free State Province.

HUERNIA LONGII **Pillans** Two subspecies are sometimes recognised: subsp. *longii* and subsp. *echidnopsoides*, but it seems preferable that the latter should revert to its previous full species status. The flowers, but not the stems, are reminiscent of those of *H. pillansii*. The plant forms clumps of up to 16 cm in diameter with the stems reaching as long as 10 cm. The plant is rhizomatous, which is unique in the huernias. These rhizomes spread underground, reappearing to produce a new cluster. The stems are greyish-green reddening towards the tips. The inflorescence arises from a small peduncle near to the base of the stems, producing up to about 5 successive flowers. Flowers are up to 35 mm in diameter, are campanulate and heavily papillate from the upper half of the tube and across the limb. The inside of the corolla is pinkish to cream with irregular dense reddish irregular spots over the entire face. The subsp. *echidnopsoides* varies almost only in the form of the corona, making it difficult to distinguish between the two. *Recent taxonomic changes have however included subsp.* echidnopsis *within subsp.* longii.

Distribution: Has a very limited distribution, from just N of Uitenhage in the E Cape. The subspecies *echidnopsoides* is recorded from the E end of the Baviaanskloof mountains, W and SW of Patensie in the eastern Cape.

HUERNIA LONGITUBA **N.E. Br.** Two subspecies are recognised here: subsp. *longituba* and subsp. *cashelensis*. The plants forms clumps up to 0.5 m wide with the greyish-green, sometimes purple-mottled stems up to 8 mm long. The inflorescence arises from a short peduncle which produces up to 3 successively horizontally-developed flowers on a short pedicel. The tubular-campanulate flowers are up to 25 mm long and up to 38 mm in diameter. The inside colour is cream and finely speckled with maroon irregular dots. The lower third of the tube has striae rather than spots. The inside of the corolla is densely papillate. The subspecies *cashelensis*, which was included, incorrectly, I believe, as a subspecies of *H. hislopii* (Bruyns 2005), varies from the nominate species mainly in its more campanulate flowers and more flaring limbs. *Recently elevated to full species rank as* H. cashelensis *Plowes*.

***Distribution*:** The subspecies *longituba* is widespread in the S half of Botswana from near Ghanzi across to Lobatse and southwards to S of Bloemfontein. The subspecies *cashelensis* occurs near the distribution area of *H. hislopii*. It is found E of Bulawayo to SW of Mutare, well W of Masvingo in Zimbabwe.

HUERNIA NAMAQUENSIS **Pillans** This is a dwarf huernia which forms dense clumps of decumbent somewhat slender stems up to 5 cm tall. Their colour is pale green suffused with pink. The inflorescence of up to 3 flowers is produced on a fairly long peduncle. The flowers are densely papillate with larger papillae in the mouth of the tube, but glabrous in the lower third of the tube. The colour is creamy to yellowish-cream, either immaculate or with irregular reddish fine to coarse spots or striae.

Distribution: This species is commonly found in the very arid country W of Springbok northwards to the Orange River.

HUERNIA NOUHUYSII **I. Verd.** This is a small species forming dense clumps of erect to decumbent grey-green to light purple stems. The inflorescence consists of up to 20 flowers produced successively from a small peduncle, which face upwards or horizontally. The campanulate flowers are small, up to 25 mm in diameter. Their colour is pale yellow with transverse dots or lines. The face is covered with raised papillae, more prominent in the tube.

Huernia nouhuysii showing the plant in cultivation, from a plant from Nooitgedacht, near Wylliespoort, Limpopo Province *Photo Darrel Plowes.*





Loukie Viljoen



Darrel Plowes



Darrel Plowes



Loukie Viljoen



Darrel Plowes



Loukie Viljoen



Loukie Viljoen



Inge Pehlemann-Brase

1 & 2. ***Huernia longii*** (1) in cultivation (2) Showing the plant in cultivation, from a plant from Groendal, W of Uitenhage
3. ***H. longii* subsp. *echidnopsoides*** A plant from near Uitenhage in cultivation
4 & 5. ***Huernia longituba*** (4) in cultivation (5) in cultivation, a plant from Shabatwa River, Kafue National Park, Zambia
6 & 7. ***H. longituba* subsp. *cashelensis*** This subspecies is being raised to species level as *H. cashelensis* Plowes. (6) in cultivation, from a plant from Chitora Farm, 40km SE of Mutare
(7) In cultivation:
8 & 9. ***Huernia namaquensis*** (8) Showing the plant in cultivation with immaculate and (9) in habitat W of Steinkopf with maculate flowers
10. ***Huernia nouhuysii*** The plant in cultivation

Loukie Viljoen



Judd Kirkel Welwitch



Distribution: Known only from the Soutpansberg from Wyllie's Poort to Vivo in the Limpopo Province, occurring on dry sandstone outcrops near the top of the mountain.

Huernia occulta **L.C. Leach & Plowes** This small species forms spreading or loose clumps up to 30 cm in diameter. The greyish-green stems are sometimes very long and trailing, up to 15 cm long. The inflorescence is produced on a very small peduncle which produces 1, but sometimes up to 3, flowers on pedicels up to 4 mm in length. The bicampanulate flowers are up to 60 mm in diameter. They are papillate with the longest papillae around the mouth of the tube, but glabrous at the bottom third of the tube. The colour of the inside corolla is creamy-white with fine to coarse irregular spots, becoming concentric stripes in the bottom of the tube.

Distribution: Confined to a relatively small area E of Bulawayo but occurs mainly in the vicinity of the Great Zimbabwe ruins south west of Masvingo in southern Zimbabwe.

Huernia oculata **Hook.f.** This is a charming little huernia which forms clumps of up to 30 cm in diameter of sub-erect sharp-toothed stems green with purple mottling stems. The inflorescence is produced from a short stout peduncle which produces many flowers in succession from near the bottom of the stems. The flowers are up to 25 mm in diameter and are borne on short pedicels which curve downwards, holding the flowers horizontal or nodding. They are bowl-shaped with the outer third being dark maroon to blackish-purple, which is thrown into sharp contrast by the white bowl which usually has fine purple flecking at the base of the bowl.

Distribution: This widespread and distinctive species is found in N Namibia also occurring very narrowly into S Angola. It avoids the deep Kalahari sands and occurs from near Windhoek in a NW swath to the Angolan border and beyond it.

Huernia pendula **E.A. Bruce** This is a mat-forming species with slender trailing stems some of which are sometimes up to 1.5 m when pendant down a rock face. These long green to pinkish stems hang from cliff edges and trails down rocks. Where they become decumbent on soil they root readily to form new plants. The inflorescence is produced from a gradually elongating peduncle which produces up to or more than 5 flowers. Flowers are on longish pedicels that tend, due to the bent nature of the pedicels, to nod or to face downwards; they are usually about 20 mm in diameter. The cupular corolla is dark purplish to blackish inside with short papillae covering the face.

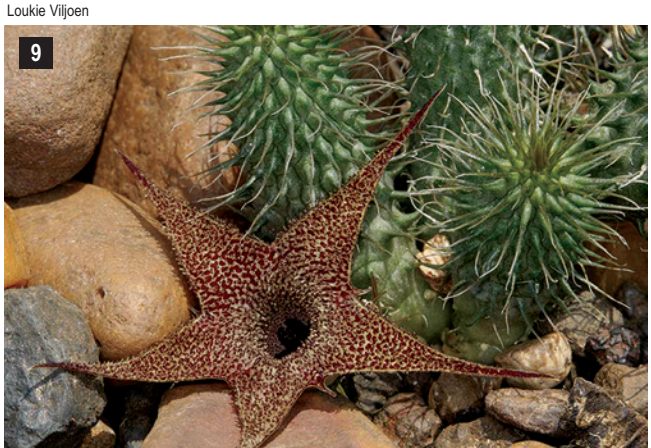
Distribution: This species favours the steep rock faces and is known only from the gorges of the lower reaches of the Bashee and Kei rivers of the E Cape.

Huernia piersii **N.E. Br.** This small species forms small clumps of dull grey-green stems which are sometimes mottled with purple. The short peduncle at the base of the stems produces up to 3 upward- or outward-facing flowers on pedicels up to 5 mm in length. The campanulate flowers are up to 40 mm in diameter. The insides are creamy yellow and finely to coarsely spotted with irregular reddish dots. The base of the tubes are broadly or finely striated with reddish lines. The corolla lobes into the opening of the tube are finely papillate, becoming fairly densely ciliate in the mouths of the tube.

Distribution: This species is found almost exclusively on almost bare dolerite domes of Andriesberg of the NE Cape.

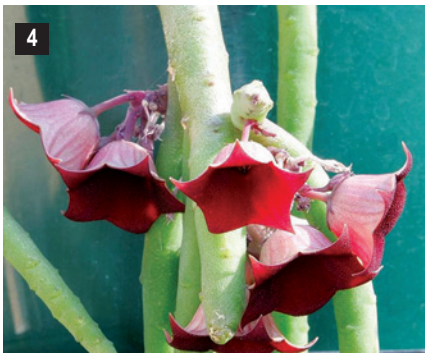
Huernia pillansii **N.E. Br.** This species is very distinctive by virtue of its stems. It is a clump-forming plant, which is sometimes rhizomatous, with many erect stems, up to 175 mm in diameter. The stems may be short and stubby or long and slender and are covered with many deltoid long and slender tubercles, which are sometimes in a spiral around the stems. The flowers are similar to those of

Loukie Viljoen





Tim Peatling



Loukie Viljoen



Loukie Viljoen



Darrel Plowes

1. ***Huernia occulta*** in cultivation showing the nature of the trailing stems
2 & 3. ***Huernia oculata*** The 'eye' huernia in habitat
4 - 6. ***Huernia pendula***
(4) Showing the plant hanging with the pendant flowers, (5) shows the bent pedicel which causes the flowers to hang down. (6) A darker flower from the Bashee River, Eastern Cape
7 & 8. ***Huernia piersii*** (7) Showing the plant in cultivation. Note the flowers in the upper picture being produced from the apex of the stem
(8) In habitat
9 & 10. ***Huernia pillansii*** (9) A plant from the Calitzdorp Dam.
(10) The plant in habitat



Loukie Viljoen



Tim Peatling



Loukie Viljoen

Loukie Viljoen

Darrel Plowes





H. longii. The insides are creamy yellow with innumerable irregular reddish spots and densely pubescent.

Distribution: This attractive species is widely distributed in the Little Karoo and the SW edge of the Great Karoo and is common around Matjiesfontein and Calitzdorp.

HUERNIA PLOWESII **L.C. Leach** This dwarf succulent forms dense clumps up to 30 cm in diameter. Stems are short and stout, grey-green and sometimes marked with purple. The inflorescence is produced from a short peduncle generally with up to 5 flowers, which generally face sideways or sometimes erect. They are produced successively on a short pedicel. Flowers are up to 36 mm in diameter. The centres have a prominent raised shiny annulus with a pentagonal tube. The colour is pale yellow, strongly marked with red to purplish-red spots or blotches, with the annulus sometimes completely red or more prominently marked than the lobes.

Distribution: This very beautiful huernia is confined to a relatively small area W of Keetmanshoop, to the W and S of Helmeringshausen in Namibia. Associated with the higher elevations of the Tiras Mountains.

HUERNIA PRAESTANS **N.E. Br.** This small clump-forming huernia has stems up to 5 cm long. The colour is greyish-green. The inflorescence is produced near the base of the stem on a small peduncle. Usually up to 4 flowers are produced successively on a longish pedicel. Flowers, which are up to 50 mm in diameter, have a definite annulus and are creamy to pale yellow with irregular small purplish to reddish spots which are larger on the annulus. The spots enlarge towards the base of the tube and tend to coalesce into short bands.

Distribution: This species is an endemic of the Little Karoo. It is found in suitable habitat from the W edge, across the N slopes of the Langeberge to beyond Vanwyksdorp, northwards to W of the Rooiberg Pass.

HUERNIA PROCUMBENS **(R.A. Dyer) L.C. Leach** The stems of this species are prostrate, forming dense mats or they trail down rock faces. They attain as much as 0.5 m in length and root readily where the stem touches the soil. They detach easily from the main stems and the loose stems root and establish separate plants. Stem colour is light green to yellowish-green. The flowers are produced on a long pedicel. They are mottled pink, to very pale yellow and the annulus is a solid pink to red. The lobes are reflexed.

Distribution: Found in a small, localised area in the extreme NE corner of South Africa in the Kruger National Park and just outside its border S of the Limpopo River.

HUERNIA QUINTA **(E. Phillips) A.C. White & B. Sloane** Forms large mats up to 30 cm in diameter. The stems are generally erect, up to 6 cm tall, short and stubby, sometimes longer, pale greenish-white to green suffused with purple. The inflorescence is produced near the base of the stems, producing up to 20 flowers with several open at the same time, on a short, sometimes branched peduncle. The attractive flowers are up to 35 mm in diameter and are produced on short pedicels and face sideways or upwards. They are creamy-white to pale creamy-yellow. The outer lobes is usually unmarked except where occasionally they have elongated spots or striae. The tube has pinkish concentric striae, becoming more dotted towards the base.

Distribution: Widely and sporadically distributed in an arch in the Limpopo Province from E of Lephalale (Ellisras), along the Waterberg to W of Groblersdal in Mpumalanga.

HUERNIA RETICULATA **Masson** This striking huernia has been transferred as a subspecies to *H. guttata*. I do not support this and retain it as a full species. In many ways it is similar to *H. guttata*, but it is absolutely consistent in its long clavate bristles in the tube of the corolla, whereas the other species has some raised papillae with short subtending bristles. The plant forms clumps of up to 20 cm with decumbent to erect stems which are grey-green sometimes mottled with purple. The inflorescence is produced on a short stubby peduncle at the base of the stems where it produces up to 3 flowers on longish pedicels which curve, facing the flowers upwards. The flowers are up to 75 mm in diameter, creamy-yellow on the inner face and heavily spotted with irregular dots over the entire surface, becoming larger and coalescing into the tube. The inner tube has long clavate inwardly-pointing cilia the lobes and outer ¾ of the annulus is glabrous.



Darrel Plowes



Loukie Viljoen



Loukie Viljoen



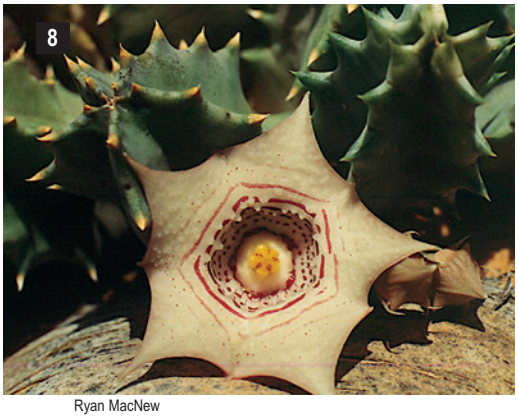
Rob Nagel



Loukie Viljoen



Darrel Plowes



Ryan MacNew

1 - 3. ***Huernia plowesii*** Note the long untidy hairs on the annulus of this beautiful species from the Tiras Mountains, Namibia
(3) A particularly dark-flowered plant
4 & 5. ***Huernia praestans*** (4) in habitat near Vanwyksdorp in the Little Karoo.
(5) The plant in cultivation
6 & 7. ***Huernia procumbens*** in cultivation from a plant from 13km W of Pafuri, Limpopo Province
8 & 9. **Huernia quinta** in cultivation
10 & 11. ***Huernia reticulata*** In cultivation

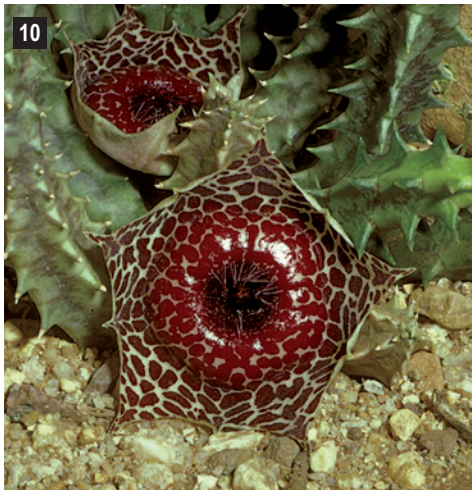


Darrel Plowes

Inge Pehlemann



Darrel Plowes



Loukie Viljoen



Distribution: It is recorded in the W Cape from about Springbok in the N, southwards and along the Olifants River valley.

HUERNIA STAPELIOIDES **Schultr.** This is a small species which forms loose clumps of up to 0.8 mm in diameter. The stems are up to 8 cm tall and are pale to darker green. The inflorescence is formed on a small peduncle, with up to 5 flowers being produced in succession from the lower parts





Huernia stapelioides in cultivation.
Top: Two separate clones showing colour variation. Flowers on the top are from Zondwake, 18 km south east of Siteke, Swaziland.
Above is a clone from east of Polokwane, Limpopo Province
Top photo Tim Peatling. Bottom *photo Loukie Viljoen*

of the stem. The flowers are up to 40 mm in diameter and are borne on longish pedicels with the flowers facing horizontally or slightly downwards. The flowers are pale cream to yellowish on the inside of the corolla with irregular striated markings becoming continuous concentric in the lower part of the tube. The face is covered with long papillae which become progressively shorter towards the edges.

Distribution: This widespread species is found from near Alldays in the Limpopo Province, NE to the Soutpansberg and E towards Tzaneen and then southwards to NW of Mbombela (Nelspruit) and across to W of Pretoria. It is also found on the E side of Swaziland.

HUERNIA THUDICHUMII **L.C. Leach** This remarkable huernia is closely related to *H. humilis*. It is a clump-forming plant with erect stems up to 4 cm high. The stem colour is greyish-green with obscure purple mottling. The inflorescence is produced from a knobby persistent peduncle near the base of the plant which produces several flowers in succession. Flowers are borne horizontally to nearly upright on a short pedicel. The glabrous flowers are up to 40 mm in diameter, yellow in colour with the mouth and into the tube sometimes faintly suffused with pink. The lobes are generally unspotted but are sometimes covered with minute pinkish dots, usually absent on the prominent annulus.

Distribution: This rare species is confined to the vicinity of Klaarstroom, which is at the N entrance of the Meirings-poort Pass in the Groot Swartberg in the S Great Karoo.

HUERNIA THURETII **F. Cels** The closely related species: *H. thuretii, H. brevirostris, H. namaquensis,* and *H. humilis*, present the taxonomist with problems as the flowers are so variable as to cause identity confusion. Two varieties are recorded here: var. *thuretii* and var. *primulina.* The species has pale-green decumbent stems with acute deltoid teeth and forms dense clumps. The flowers are borne on pedicels up to 25 mm long. The corolla is up to 35 mm in diameter. The faces of the yellow flowers vary considerably: from heavily marked with transverse long to short purple to reddish striations to smallish irregular laterally elongated dots. Markings are invariably longer towards the centre of the flower. These variations are so great that it is not surprising that taxonomists have avoided allocating subspecies or varietal status to the plants. The outer corona is almost linear and bifid and purple. The inner lobes are dark to pale red. The variety *primulina* varies in its complete lack of markings, its larger flowers frequently have an annulus and are sometimes quite densely papillate. *Variety* primulina *has recently been returned to species rank as* H. primulina *N.E. Br.*

Distribution: This species is widely spread across the E Cape, from Grahamstown to Mossel Bay, then northwards



Loukie Viljoen



Martin Heigan



Darrel Plowes



Tim Peatling

1 & 2. ***Huernia thudichumii*** in cultivation
3 & 4. ***Huernia thuretii* var. *thureti*** in cultivation from Kaffirdrif, 40 km SE of Grahamstown
5 & 6. ***H. thuretii* var. *primulina*** (5) (left) in cultivation showing the difference between variety *primulina* and (right) variety *thureti* (the striped flowers)
(6) In cultivation, a plant from near Fort Beaufort, Eastern Cape

Loukie Viljoen



Darrel Plowes



to Graaff-Reinet. The variety *primulina* occurs mainly in the SW of the species range.

Huernia transvaalensis **Stent** Forms large dense to loose clumps up to 1 m wide. The stout stems are up to 10 cm long, pale- to grey-green in colour, with strong deltoid teeth. The inflorescence produces up to 3 flowers on short pedicels from a short peduncle at the base of the stems. The flowers are held facing upwards. The flowers are up to 30 mm in diameter, whitish to pale yellow with heavy sub-linear irregular reddish to purple lines with markings on the lobes. They tend to be unicolour on their shiny annulus. The lobes and outer two thirds of the annulus are glabrous the inner one third of the annulus and the inside of the tube is papillate with long linear hairs.

Distribution: Occur principally N of the Magaliesberg to Lephalale (Ellisras) and SE to Marble Hall in Limpopo Province with one disjunct record from Vryburg in the North West Province.

Huernia urceolata **L.C. Leach** This small, most unusual species, forms clumps of erect stems up to 15 cm tall. The stems are greyish-green, mottled with purple blotches. The marginal teeth are prominent and pointed, sometimes spirally arranged. The nodding urceolate globose flowers are uniformly purplish to pale red and smooth on the outside. Their inside is purple on the upper half with a white band and purple near the corona. Flowers are up to 12 mm long and up to 14 mm broad and are produced on a short pedicel. The outer lobes are narrow and strongly recurve. The corona is purple.

Distribution: This species is found in the north-western corner of Kaokoland in Namibia in a restricted area W of the Baynes Mountains. It occurs sporadically along the Kunene River to near the Ruacana Falls. In Angola it occurs around Mossamedes.

Huernia verekeri **Stent** This species has three sub-species of which two are represented in southern Africa. this small succulent forms loose clusters of up to 1 m in diameter. The green to purplish-green stems are fairly slender and prominently tubercled: up to 10 cm long. Up to 5 flowers are produced from a stout knobbly peduncle on pedicels up to 15 mm long. The tube is up to 45 mm in diameter. The tube sinks abruptly into a pentagonal cupular shape, which is deep purple or red, becoming abruptly lighter red and fading to yellowish at the base of the cup. Variety *pauciflora* varies little from the nominate and, only in the much longer stems, the number of flowers produced, slight difference in the corona and the density of the covering cilia. Their cream to yellowish flowers are covered with tiny red cilia, becoming lightly suffused with pink towards the tube. Recent taxonomic changes have elevated subsp. *repens* to species level.

Distribution: The variety *verekeri* is a widespread variety and occurs from S of Lake Kariba to W and S of Bulawayo and S of Mutare in Zimbabwe and narrowly into the adjacent Mozambique. The variety *pauciflora* occurs only near the coast around the mouth of the Save (Sabi) River in Mozambique. It is also reported from the Gorongosa National Park in Mozambique.

Huernia volkartii **Peitsch. ex Werderm. & Peitsch.** (Illustrations on P. 144) This is a tuft-, sometimes mat-forming species with erect, sometimes decumbent stems 5–angled species, up to 5 cm tall. Their colour is grey-green to reddish. The inflorescence is produced on a small peduncle from near the base of the stems. Flowers are up to 30 mm in diameter and face horizontally or upwards on a short pedicel. Their colour is creamy and they are densely covered with irregular, somewhat linear dots. The lower part of the tube has linear striae. From about halfway in the tube the whole face is covered with long robust papillae with linear striae. There are two varieties: *repens* differs from the nominate species in its long creeping stems and ± obsolescent tubercle teeth. (*Illustrations on P.38*)

Distribution: Occurs in moister habitats on granite and quartzite hills, E Zimbabwe escarpment, N & S of Mutare and narrowly into Mozambique. It occurs near and SW of Masvingo. Variety *repens* is found in the same region, but only S of Mutare and also near Masvingo.



Darrel Plowes



Darrel Plowes



Darrel Plowes



Loukie Viljoen



Darrel Plowes

1 & 2. ***Huernia transvaalensis*** in cultivation
3 & 4. ***Huernia verekeri*** (3) in habitat from a plant from Nyanyadzi,Save (Sabi) Valley Zimbabwe
(4) The plant in cultivation
5. ***H. verekeri* var. *pauciflora***
6 & 7. ***Huernia urceolata*** (6) in cultivation, a plant from 80 km W Lubango, Angola. (7) in cultivation

Darrel Plowes



Loukie Viljoen







Huernia volkartii in cultivation top: from W of Lubango, SW Angola.
Below: ***H volkartii* var. *repens*** from 80 km S of Masvingo *Photos Tim Peatling.*

Huernia white-sloaneana **Nel** This is a small tufted species up to 5 cm high. The stems are up to 6 cm in length and are green with purple mottling. The inflorescence of up to 3 successively produced flowers is produced on a short peduncle and the pedicels are up to 8 mm in length, The flowers are up to 50 mm in diameter and up to 10 mm long. The outside of the corolla is heavily veined and has purple mottling. The inside is creamy yellow, heavily marked with irregular elongated dots and striae. The lower part of the tube has concentric lines. The campanulate inside face is heavily covered with long stout striped papillae.

Distribution: This unusual species is endemic to South Africa and does not appear to occur across the Limpopo River. It is confined to the upper slopes and the N hinterland of the Soutpansberg from N of Louis Trichardt to near the W border of the Kruger National Park in the Limpopo Province.

Huernia zebrina **N.E. Br.** This species, especially subspecies *magniflora*, is probably the best-known in cultivation and not without good cause. It is easy to grow and flowers readily. The magnificent flowers are much admired. The inclusion of subsp. *magniflora* E. Phillips as being synonymous with the nominate species is not accepted here as the differences are so marked as to favour the separation. The flowers of subsp. *zebrina* are considerably smaller (up to 4.5 cm) as opposed to subsp. *magniflora* (up to 7.5 cm), the corolla tube is shorter and the widely separated habitats are sufficient reasons for the separation. The plant is large and loosely clump-forming with the stems grey-green and usually mottled with purple. The striate markings on the minutely papillate corolla lobes, are red to reddish-purple on a pale whitish-yellow background. The very prominent annulus is usually heavily marked with solid to broken shiny red to purplish-red.

Distribution: The subspecies *zebrina* is an inhabitant of N KwaZulu-Natal in a narrow band away from the coast from W of Richards Bay, into Mozambique and Swaziland. The subspecies *magniflora* occurs from S of Polokwane north-wards into S and SE Zimbabwe with outliers near Gaborone in Botswana.

Huerniopsis R. Br.

This remarkable genus has, with insufficient thought as to its unique characteristics, been included in the genus *Piaranthus*. I with many others do not uphold this transfer and it is hereby retained as its own genus. It is beyond the scope of this work to delve too deeply into taxonomic nuances, but it is sufficient to say that the general appearance, the difference in the stem morphology, the presence of clavate vibratile cilia in the sinus of the flowers of the type species, *H. decipiens* – a feature not present in any other *Piaranthus* – and the unique coronal structure, is convincing evidence that this must remain a genus of its own. Furthermore this genus has sweet-smelling flowers and is mainly dependent upon night-flying moths and beetles for its cross-pollination, unlike the *Piaranthus* flowers which are generally foul-smelling.

Huerniopsis atrosanguinea **(N.E. Br.) A.C. White & B. Sloane** This unusual caespitose species has stems, decumbent at the base, which are green to greyish, mottled with purple, up to 10 cm in length and up to 20 mm thick. The inflorescence is borne with or without a short peduncle on a pedicel up to 7 mm long which arises from the upper



Darrel Plowes



Loukie Viljoen



Loukie Viljoen



Loukie Viljoen



Loukie Viljoen



Loukie Viljoen



Darrel Plowes



Tim Peatling

1 - 3. ***Huernia white-sloaneana*** (1) in habitat N of Louis Trichardt, in the Soutpansberg (2 & 3) Pictures of the plant in cultivation
4 & 5. ***Huernia zebrina*** **subsp.** ***zebrina***
6 & 7. ***H. zebrina*** **subsp.** ***magniflora***

8 - 11. ***Huerniopsis atrosanguinea*** (8) in cultivation a plant from near Gaborone. (9) A plant in cultivation (10) A plant in cultivation from Dibete, Botswana. (11) A plant in cultivation

Darrel Plowes



Darrel Plowes



Loukie Viljoen



half of the stems. The flowers are up to 45 mm in diameter and are deep rich red, rich brown to maroon. They are sometimes marked with yellowish cream on the lobe tips, the limb or even the entire flower and are somewhat rugose over the entire surface.

Distribution: This is a widespread species, occurring in the regions surrounding Lobatse, Gaborone in Botswana and N of Thabazimbi to Alldays in South Africa.

HUERNIOPSIS DECIPIENS **N.E. Br.** This species has decumbent dull-green or purplish stems which are up to 9 cm long and up to 20 mm thick. The inflorescence is usually one per stem arising from a small peduncle on the upper half of the stem and producing up to 3 flowers on a longish pedicel. The campanulate flowers are up to 30 mm in diameter. The tube is distinctly pentagonal. The colour varies from purple to red, unicoloured to heavily mottled with creamy yellow. There are several clavate vibratile cilia on the edge of the lobes around the sinuses.

Distribution: Widespread from near Prieska in the S, eastwards to the Orange River, to N of Upington and NE to N of Gaborone. It is also found in the very dry regions of Botswana from Ghanzi northwards and again in a large area with Windhoek in Namibia as its centre.







Huerniopsis decipiens Right: in cultivation
Photo Sylvain Bergaud,
Below left: in cultivation
Photo Loukie Viljoen
Below right: a plant about 8 km from Windhoek
Photo Darrel Plowes

LARRYLEACHIA **Plowes**

Larryleachia replaces sections of the old genus *Trichocaulon*. The reason for this change was the transfer of the tricho-bearing species into the existing genus *Hoodia* and the hairless species being included in this new genus. The genus is characterised mainly by the tessellate, sub-globose bodies of the plants.

LARRYLEACHIA CACTIFORMIS **(Hook.) Plowes** This is not as widespread a species as the other similar plants. When not in bloom it could easily be confused with *L. picta*, especially when small. It can grow to a fairly large size, up to about 15 cm tall and up to about 6 cm thick and 10 or more semi-decumbent stems have been seen on some plants. The colour is grey-green and the cylindric clavate stems are tessellate. Up to 5 flowers are borne on very short pedicels on the upper parts of the stems. These are shallowly campanulate, heavily papillate and palest cream to whitish-yellow in colour and strongly marked with purple to reddish mottling comprised of irregular dots and lines. The tips of the lobes are usually unicoloured.

Distribution: This species seems to be less widespread than others of its kind. It appears to be endemic to South Africa although it occurs close to the Orange River. It occurs on the higher mountainous areas of the Richtersveld eastwards to near Pofadder, southwards to S Bushmanland, S and W of Brandvlei.

LARRYLEACHIA FELINA **(Cole) Plowes** This rare species can grow to up to 14 cm tall and up to 6 cm thick and up to 8 or more semi-decumbent stems are produced. Its colour is grey-green and the cylindric clavate stem is tessellate. Up to 5 flowers are borne on very short pedicels on the upper parts of the stem. The campanulate flowers are usually unicoloured, but can be barred with yellowish to whitish lines.

Distribution: This is an inhabitant of quartz fields from the Rosyntjieberg in the Richtersveld National Park across the rest of the Richtersveld to N of Steinkopf.

LARRYLEACHIA MARLOTHII **(N.E. Br.) Plowes** This is usually a very small sub-globose species and the stems are generally not much more than 125 cm tall, although they may elongate to en excess of 15 cm. It can form many



Horst Burba



Darrel Plowes



Darrel Plowes



Tim Saunderson



Darrel Plowes

Gerhard Beukes

1 - 3. ***Larryleachia cactiformis*** in cultivation
4 & 5. ***Larryleachia felina*** (4) in cultivation from a plant collected on the Rosynjieberg, Richtersveld National Park. (5) A strange crested specimen which is believed to be *L. felina*

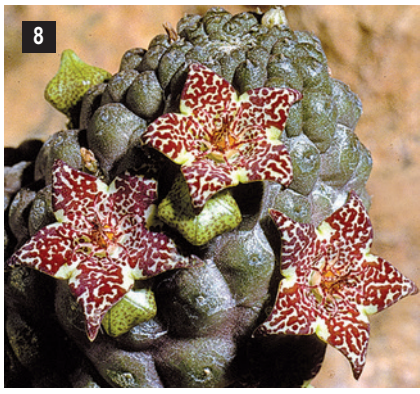
6 - 8. ***Larryleachia marlothii*** (6) in habitat in the Klinghardt Mountains, SE Namibia. (7) in habitat at Umdaus, E Richtersveld (formerly *L. dinteri, to* which species it will probably be reinstated). (8) The species in cultivation from a plant from Warmbad, Namibia



Robin Frandsen



Darrel Plowes



separate stems and up to as many as 30 have been recorded. There is some controversy as to whether the former species *L. dinteri*, which has been made synonymous with this species, should be retained as a separate species. I am not convinced and have not made the distinction here. The stems are erect to spreading, cylindric, ovate or even clavate. Their colour is greyish- to brownish-green in habitat but are generally green in cultivation. The flowers are usually on the upper parts of the stem but may be all over. They are almost sessile, very shallowly campanulate and are up to 15 mm in diameter. Their colour varies from almost uniform purplish in their northern range to reddish-brown marked with yellowish mottling. The 'forceps' shape of the outer corona lobes is prominent. *Recently* L. dinteri *(A. Berger) Plowes has been retained as a separate genus*

Distribution: This species is the most widespread of the genus. It occurs coastally from near the Angolan border to just S of the Orange River in the Richtersveld, where it is very prolific and across to near Pofadder.

LARRYLEACHIA PERLATA **(DINTER) PLOWES** This is a medium to large species forming up to 12 branches up to 35 cm tall. The stems are pale green to light beige. The small flowers are produced on a very short pedicel, giving the impression of being sessile to the stem. The malodorous flowers are up to 10 mm in diameter, unmarked pale yellow to light pink lightly to heavily marked with purple and with a prominent annulus. The surface is covered with dense papillae tipped with a horizontal obtuse bristle.

Distribution: Two disjunct areas are identified: The smallest is up in the N, S of Lüderitz, in the Klinghardt Mountains and the S population extends from Rosh Pinah in Namibia, southwards into the Richtersveld. Also occurs quite commonly near Vioolsdrif and N of Steinkopf.

LARRYLEACHIA PICTA **(N.E. Br.) Plowes** This is a striking species which is generally solitary, but only rarely branches from the base, where up to 5 stems have been observed. The stems are up to about 20 cm in height and up to 60 mm thick, cylindric to clavate. Their colour is greyish-green. The shallowly-campanulate flowers are produced at and near the apex of the stem. Flowers are generally larger than others of the genus, up to 15 mm in diameter. Their colour is creamy white to yellowish, heavily spotted with purple to reddish irregular spots and with the tips of the lobes uni-coloured. Unusual and characteristic for the genus is the pentagonal shape of the cup. The prominent corona is unusual in that the inner lobes are located under the crossed outer lobes.

Distribution: Occurs from Aus to Witputs in Namibia and S to the Pofadder district and eastwards to near Douglas and Prieska in the Northern Cape Province, southwards to Strydenburg in the Great Karoo and across to Williston in the west.

LARRYLEACHIA TIRASMONTANA **(Plowes) Plowes** This is a singularly beautiful species, mostly with a single stem coloured whitish to grey-green, up to 18 cm tall and up to about 45 mm thick. The flowers are produced mainly near the apex of the stem on a very short pedicel. The flowers are up to 9 mm in diameter, shallowly campa-nulate and densely papillate. They are creamy-white to pinkish with small irregular dots with the tips of the lobes uni-coloured.

Distribution: This species is confined to the region around the Tiras Mountains in the Sperrgebiet, in SW Namibia.

LAVRANIA Plowes

This is a monotypic, most unusual genus which was first believed to have been a hybrid. This has however been disproven and has thus, because of several of its unique features, has been given generic status. The flower colour varies quite dramatically.

LAVRANIA HAAGNERAE **Plowes** The stems of this species are reminiscent to the stems of that of plants of the genus *Larryleachia*, in their being tessellate. They are however much-branched and thinner. The tubercles also have very short

Ernst van Jaarsveld





Robin Frandsen



Robin Frandsen



Richard Wagner



Robin Frandsen



Dennis de Kock

1 - 3. ***Larryleachia perlata*** (1 & 2) in habitat on Helshoogte, Richtersveld National Park. (3) In habitat on the eastern edge of Richtersveld, north of Steinkopf
4 - 6. ***Larryleachia picta*** in cultivation (6) In habitat near Witputs, S Namibia. *L. picta* will probably be included in *L. cactiforme*
7 & 8. ***Larryleachia tirasmontana*** (7) In cultivation. (8) A plant from Tsams West, S Namibia
9 - 11. ***Lavrania haagnerae*** (9) Plant in habitat at Sesfontein, NW Namibia. (10 & 11) In cultivation



Gerhard Beukes



Loukie Viljoen

Paolo Michelazzo



Iztok Mulej



Darrel Plowes



bristles at their tips, reminiscent of *Larryleachea perlata, L. cactiforme* and *L. picta*. The whitish-green stems are somewhat decumbent from the base with the apices erect. They form clumps of up to as many as 100 stems and are up to 30 cm long and up to 3 cm wide. The inflorescences are produced from the base of the stems arising from a curious flattened peduncle. As many as 5 flowers arise on a short pedicel. Flowers are up to 16 mm in diameter, the lobes vary from fairly acute to broad. Their colour is yellow with fine to large, almost totally coalescing, irregular spots.

Distribution: This rare species is confined to a very small area, on steep dolomitic rocky slopes on the mountains around Sesfontein in NW Namibia.

XLUCKHOFFIA C.A. Lückh.

This putative hybrid has been included as it has been in cultivation and popular with collectors for many years and was first described by Lückhoff in 1934. It is believed to be an inter-generic hybrid between *Stapelia arenosa* and *Hoodia gordonii*. Its single taxa is *XLuckhoffia beukmannii* C.A. Lückhoff [*Hoodia gordonii X Stapelia arenosa* (Bruyns 1993)].

Distribution: Originally recorded by Beukmann as having been found about 40 km NE of Clanwilliam at Doringbos on the road through the Pakhuis Mountains to Calvinia and Loeriesfontein.

NEOPECTINARIA Plowes

The transfer of this very distinctive genus to *Stapeliopsis* is, in my, and other botanical authorities', opinion, quite unjustified. It is beyond the scope and principles of this book to enter fully into the debate. The overt morphological differences with other taxa and the obvious features which identify the four species described below is sufficient evidence for their retention in *Neopectinaria*.

NEOPECTINARIA BREVILOBA **(R.A. Dyer) Plowes** This is a dwarf species with decumbent stems which sometimes extend underground. The aboveground stems are up to 15 cm in length and about 8 mm thick. Their colour is greenish to greyish-brown. The inflorescence generally forms from near the base of the stems from a small peduncle which is sometimes underground. The flowers are borne on short pedicels and are reddish-yellow to purplish on the outside. The inside is smooth for about half the tube and is then covered with long bristles for the rest. The little flowers are about 6 mm long, with tiny connivent lobes.

Distribution: This species is endemic to the region between Worcester and Swellendam, especially near to the Breede River.

NEOPECTINARIA PILLANSII **(N.E. Br.) Plowes** This rather peculiar species forms mats up to about 17 cm in diameter. The stems are up to 13 cm in length and 24 mm thick. Their colour is green to pinkish. The little campanulate, dependent flowers are produced virtually on the ground or mainly underground and are produced on the undersides of the stems, where the parts of the stems are whitish to pinkish, It is presumed that they are pollinated by ants. The flowers are about 14 mm in diameter. The inside colour is purplish-red and is covered with short bristles on the limb and lobes and long bristles within the cup.

Distribution: This is an uncommon species with a fairly wide distribution from N of Port Elizabeth to S of the Zuurberg and across to S of Beaufort West and eastward to near Steytlerville.

NEOPECTINARIA SAXATILIS **(N.E. Br.) Plowes** This is a dwarf species which does not spread underground and forms a mat up to 30 cm in diameter. It characteristically has 4–angled greenish stems, which are sometimes purple-mottled and which are prostrate, growing up to 30 cm. The inflorescence is produced on a small knobbly peduncle with 1–many flowers on a short pedicel. Flowers are dark purple to deep red to yellowish with short connivent lobes on an ovate body. The inside of the corolla is glabrous for the first two thirds and with shortish bristles on the last third.

Distribution: There are two discrete populations. In the NW the plant occurs near Vanrhynsdorp across to Calvinia, and in the S it is widespread from the Worcester Robertson Karoo, across the length of the Little Karoo, the southern Great Karoo from Laingsburg to Prince Albert. Further S from the Little Karoo it occurs all the way to S of Steytlerville.



Loukie Viljoen



Tim Peatling



Darrel Plowes



Nigel Dennis



Darrel Plowes



Loukie Viljoen

1. *X**Luckhoffia beukmanii*** in cultivation
2 & 3. ***Neopectinaria breviloba*** A plant from near Worcester
4 & 5. ***Neopectinaria pillansii*** (1 - 4) in cultivation
(5) In cultivation from a plant from Halesowen, near Cradock, E. Cape

6 - 9. ***Neopectinaria saxatilis***
(6) in habitat south of Uniondale
(7) In cultivation from a plant from Zebra, near Oudtshoorn, Little Karoo
(8) In cultivation, note the atypical divergent lobes
(9) In cultivation from a plant from near Touws River

Dennis de Kock



Darrel Plowes



Darrel Plowes



***Neopectinaria stayneri* (Bayer) Plowes** Unlike the other members of *Neopectinaria* the lobes of this small species rarely do not remain connivent after the flower is fully opened. This is a dwarf non-rhizomatous species which forms mats of up to 30 cm in diameter. the stems are by nature prostrate, are generally 4–angled and up to 25 cm long and about 10 mm thick. They are green, reddish or yellowish green, sometimes mottled with pale purple. The inflorescence is produced on a small peduncle with a number of flowers being produced on pedicels up to about 10 mm long. The flowers outside are light purple to usually reddish fading to almost whitish at the base. The inside colour is pinkish fading to pale yellow at the base. The lobes very occasionally remain connivent, but not necessarily all of the lobes. Their length is about 8.5 mm and width about 5 mm.

Distribution: Recorded only from the lower reaches of the Breede River, SE of Swellendam.

Notechidnopsis Lavranos & Bleck

This monotypic genus, together with the monotypic genus *Richtersveldia,* was excised from *Echidnopsis*, which leaves no species of the genus *Echidnopsis* occurring in this region. The mono-typic species *Richtersveldia columnaris* was originally included in this genus but has since been included in its own generic status.

***Notechidnopsis tessellata* (Pillans) Lavranos & Bleck** This small prostrate to decumbent species eventually forms a tangled mat of thin tessellate stems. Their colour is purple to purplish-green. The almost sessile colourful flowers, which are borne usually on the upper half of the side stems, are small and borne in clusters of up to 5 on short pedicels. They are barely 10 mm in diameter and the face is densely covered with papillae which have short bristles. The colour varies from uniform deep reddish-purple to purple, transversely speckled with pale yellow, with the speckling becoming less extensive and often absent towards the centre of the corolla. The corona is prominent and orange.

Distribution: Found on the plateau, E of the Knersvlakte, to as far W as Calvinia and northwards to Loeriesfontein. Also occurs in the Knersvlakte, but not in the celebrated quartz fields, rather in the shales of low hills.

Ophionella Decne.

This genus of just 3 taxa was erected to accommodate the species *Ophionella arcuata*, previously known as *Pectinaria arcuata*. The genus has close ties with *Neopectinaria*, but cannot be accommodated in that genus because of profound morphological differences. Another close relative is the very interesting genus *Stapeliopsis*. Stems are prostrate, sometimes descending underground and they produce roots along the entire length where they touch the soil.

***Ophionella arcuata* (N.E. Br.) Bruyns** The prostrate greenish stems of this species have an unusual growth. They often arch up (hence the name 'hoop-like'), then descend and become subterranean and then re-emerge. They are long, up to 25 cm long and up to 8 mm thick. The inflorescence is produced on short pedicels and the flowers sometimes emerge from underground. They are up to 13 mm long and > 10 mm diameter. The lobes are about half the length of the flower. Their outside colour is pale cream to brownish, fading to pale green at the tube. Inside they are pale cream on the lobes and changing abruptly to dark purple or reddish-purple in the tube.

Distribution: Occurs mainly in the upper reaches of the Great Fish River from the Zuurberg mountains south eastwards to N of Grahamstown.

***Ophionella mirkinii* Pillans** This is another of the species with decumbent stems which tend to arch and then become somewhat subterranean. Stems are up to 23 cm in length and about 7 mm thick. The plant is indistinguishable from *O. arcuata* except when in flower. The campanulate flowers are on very short pedicels and tend upwards. The lobes are divergent and outside are creamy-white, densely papillate usually unicoloured. The inside is creamy-yellow on the lobes and limb, with the cup dark purple. The lobes are sometimes purple-tipped.

Distribution: Occurs from E of Willowmore, across to Steytlerville and W of Port Elizabeth.

***Ophionella willowmorensis* Bruyns** The green to pinkish stems of this decumbent species is sometimes subterranean, where they are slender, emerging later and becoming thicker. They are recorded as being up to 15 cm long



Loukie Viljoen



Loukie Viljoen



Darrel Plowes





Inge Pehlemann-Brase,
inset: Darrel Plowes



Dennis de Kock



Darrel Plowes



Loukie Viljoen



Tim Peatling

1 - 3: ***Neopectinaria stayneri*** (1 & 2) in cultivation (3) In cultivation from a plant from near Cape Infanta, south of Swellendam
4 - 6. ***Notechidnopsis tessellata*** (4 & 5) in habitat north east of Nieuwoudtville
7 & 8. ***Ophionella arcuata*** (7) in cultivation. Note the darkish-brown lobes and green tube. (8) in cultivation
9 & 10. ***Ophionella mirkinii*** (9) in cultivation in habitat at Zandpoort, near Steytlerville. (10) In cultivation
11 & 12. ***Ophionella willowmorensis*** The plant in cultivation. (11) A darker flower (12) A pale-coloured flower from west of Kleinpoort, south of Jansenville

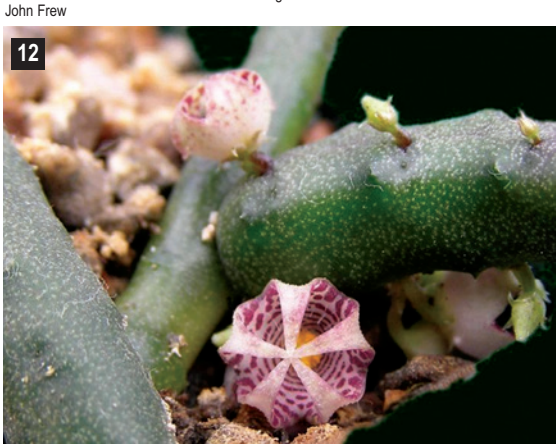
Dennis de Kock



Jeff Harris



John Frew



and about 5 mm thick. The flowers are produced on a short pedicel. The strange almost globose little flowers which are up to about 7 mm long and about 6 mm in diameter are whitish to pinkish outside and papillate. They are whitish inside and glabrous with linear markings in the base becoming more irregular and with elongated dots in pinkish- to darkish -red.

Distribution: Recently discovered, this species occurs in the mountains north east of Willowmore, extending to near Kleinpoort, east of Steytlerville.

ORBEA Haw.

This genus was originally created to include a large number of taxa but has, since those early days, been subject to major attrition by taxonomists, with some of the original taxa being transferred to new or existing genera. The genus is characterised by the flowers being few, up to 3, very rarely 4 or more to a peduncle and opening successively.

ORBEA CILIATA **(Thunb.) L.C. Leach** The green and prominently marked with purple stems of this large species are up to 12 cm tall and up to 25 mm thick. They are robustly tuberculate. The inflorescence arises from a point, without a peduncle, near the base of the stem. The shallow bowl-shaped flowers are held upwards, near the base of the plant on pedicels up 25 mm long. The flowers are finely-speckled, creamy to pale yellowish with the annulus usually slightly lighter-coloured than the lobes and tube, the lobes are occasionally suffused with pale reddish brown. The flowers are smooth outside and densely but finely papillate on the inside. The flowers have a prominent trumpet-shaped annulus. The lobes are liberally fringed with long white, clavate cilia.

Distribution: This robust and attractive species is found in the S Ceres Karoo, around Loeriesfontein and in the vicinity of Prince Albert in the S Great Karoo.

ORBEA COOPERI **(N.E. Br.) L.C. Leach** This species forms dense clumps of up to > 12 cm in diameter. Stems are 8 cm tall, are green with purple to brownish patches. The inflorescence is produced on a peduncle with pedicels up to 10 mm long. Flowers which are borne facing upwards, are up to 35 mm in diameter. The inside is transversely rugose. The rugosities are white to yellow on a brownish- to reddish-background. A small raised lighter-coloured annulus surrounds the corona, with denser surface rugosities. The lower third of the lobes, but not into the sinuses, have several purple clavate and vibratile cilia.

Distribution: This is a very widespread species endemic to South Africa: it occurs from near Brandvlei in the W, northwards to Upington, near Kimberley and E of Winburg, then southwards to near Cradock.

ORBEA DOLDII **Plowes** There is much controversy regarding the three species: *O. doldii, O. macloughlinii* and *O. speciosa*. The reasons for the retention of *O. doldii* as a valid species is the very different patterning on the corolla. Until DNA or other key factors are produced to disprove its validity it will be retained. The stems are up 10 cm long with longish marginal teeth. The inflorescence is one per stem near its base, with up to 3 flowers being produced. The flowers are up to about 50 mm, with a small annulus surrounding the corona. The colour is yellowish with brownish to reddish linear irregular markings, sometimes fairly narrow to very broad. The edges are densely fringed with long clavate, vibratile cilia.

Distribution: This rare species is confined to a small area near the Tsitsa Falls about 60 km N of Mthatha in the E Cape.

ORBEA ELEGANS **Plowes** This extremely rare plant is a relatively recent discovery and was well-named the 'elegant *Orbea*'. Both the stems and flowers are attractive: the stems are up to 7 cm tall with very prominent spreading teeth. They are mottled with different shades of green in summer becoming purplish in winter. The inflorescence is produced from near the base and is very floriferous. The pedicels are up to 25 mm long and are decumbent. The flowers develop consecutively from near the base of the plant and are up to about 27 mm in diameter. They are supine on the ground. The flower is cream-coloured on the inside with a prominent annulus. The surface of the lobes is rugose, marked with prominent reddish, laterally elongated, spots, ranged in serried longitudinal ranks. The annulus is smooth and heavily marked with the red and is almost unicoloured.

Distribution: Occurs on the SE foothills of the Blouberg in Limpopo Province, E of the Glen Alpine dam.


1

Darrel Plowes


5

Tim Peatling


2

Loukie Viljoen


7

Darrel Plowes


6

Tim Peatling


3

Loukie Viljoen

1 & 2. ***Orbea ciliaris*** (1) in habitat 20 km S Loeriesfontein (2) In cultivation
3 & 4. ***Orbea cooperi*** in cultivation
5 - 7. ***Orbea doldii*** (5 & 6) In cultivation (7) In cultivation from a plant 1 km E of Buntingville, 10km SE of Mthatha
8 & 9. ***Orbea elegans*** Plants from the type locality at Blouberg, Limpopo Province in cultivation


8

Loukie Viljoen

Loukie Viljoen


4

Darrel Plowes


9

Orbea halipedicola **L.C.Leach** This attractive species forms loose clumps and can be rhizomatous. The stems are up to 15 cm long with long teeth. Their colour is green and often streaked with brown. The inflorescence is produced near the base of the stem on a short peduncle with up to 3 flowers being produced successively. The flowers have longish pedicels and are up to 40 mm in diameter. the flower is flattish with the lobes somewhat reflexed and with a small annulus surrounding the corona. The colour of the inside face is cream to pale yellow, heavily or very heavily marked with coalesced elongated dark red lines or dots. The edges are fringed with long red clavate vibratile cilia.

Distribution Endemic to central Mozambique, also recorded from the coastal flats N of the Save River and N of the Buzi River. It is best known from the Gorongoza Crater.

Orbea longidens **(N.E. Br.) L.C. Leach** This is a clump-forming, sometime rhizomatous, dwarf plant with green stems, sometimes marked with purple, up to 12 cm long. It is characterised by the very long marginal teeth. The inflorescence is produced on a short peduncle from the base of the plant. The flowers are borne on pedicels of up to 20 mm long and are up to 50 mm in diameter, flattish with a central tube. Their colour is cream to whitish-yellow, heavily marked with red irregular transverse dots which coalesce into solid red on the outer half of the lobes. The edges of the lobes can be somewhat folded upwards and are fringed for at least the lower half of their edges with long, clavate vibratile cilia.

Distribution: Recorded patchily from the KwaZulu-Natal coast from S of Lake St Lucia N to Xai Xai in S Mozambique.

Orbea macloughlinii **(I. Verd.) L.C. Leach** This species is one of the triad of plants, *O. macloughlinii, O. speciosa* and *O. doldii* which is controversial and which, until assumed to be, by DNA or other factors, the same, must be regarded as a separate species. The stems are up 10 cm long with longish marginal teeth. The inflorescence is one per stem, near its base, with up to 3 flowers being produced. The flowers are up to about 50 mm, with a small annulus surrounding the corona. The colour is yellowish with brownish to reddish linear irregular markings, sometimes fairly narrow to very broad and sometimes unicoloured. The edges are densely fringed with long clavate, vibratile cilia.

Distribution: In the Oribi Gorge in S KwaZulu-Natal and from the vicinity of the Mthatha Falls on the Mthatha River just E of Mthatha in the eastern Cape.

Orbea maculata **(N.E. Br.) L.C. Leach** This distinctive species forms small separate clumps from long rhizomes. The stems are erect and up to 10 cm tall with longish, prominent marginal teeth. They are pale green marked with purple. The inflorescence is formed near the base of the stem and produces up to 5 flowers each on pedicels up to 50 mm long. The starfish-like flowers, which lie flat on the ground, are up to 75 mm in diameter with long narrow, slightly reflexed lobes, fringed with white clavate cilia for about half their length from the sinuses. Their colour is creamy-white to distinctly yellow with elongated reddish to brown dots and lines, usually of a solid colour at the tips becoming more broken towards the centre. One subspecies is recognised at present: subsp. *kaokoensis* Bruyns, which will be reclassified as *O. kaokoensis* (Bruyns) Plowes, as it is so very different: the stems are larger; the rhizomes produce small clusters as much as 0.5 m from the parent plant. The greenish to yellowish inner corolla faces have elongated spots which coalesce into a solid colour in the tube and the clavate cilia is white.

Distribution: The subspecies *maculata* is very widespread from N and NW Botswana to near Gaborone, near to Bulawayo in Zimbabwe, southwards to the South African border where it is found in the Limpopo Province near to Giyane; also found S of Mutare, southwards, and as far S as near Ulundi in KwaZulu-Natal. The subspecies *kaokoensis* is found in a limited range around the S foothills of the Baynes Mountains in NW Namibia.

Tim Peatling


10



Dennis de Kock



Loukie Viljoen



Darrel Plowes



Nigel Dennis



Loukie Viljoen



Loukie Viljoen

1 - 4. ***Orbea halipedicola***
Three different clones in cultivation showing the wide variation in the corolla markings. (4) in cultivation, a plant from Gorongoza National Park, Mozambique
5 & 6. ***Orbea longidens*** in cultivation
7 - 9. ***Orbea macloughlinii*** in cultivation:
(9) From Tsitsa Falls, north of Mthatha. E Cape
10. ***Orbea maculata*** in habitat 4 km West of the Devure river bridge, Save Valley, Zimbabwe.
11. *O. maculata* subsp. *kaokoensis* in cultivation.
This subspecies has now being reclassified as Orbea kaokoensis (*Bruyns*) *Plowes*

Loukie Viljoen





Dennis de Kock



Dennis de Kock

Tim Peatling



Orbea namaquensis **(N.E. Br.) L.C. Leach** This remarkable species appears to be a very robust version of *O. variegata*. In every respect it is a large species. It forms large mats of up to 1 m in diameter. The stems are robust, up to 10 cm in height but up to 4 cm thick with stout marginal teeth. They are green and usually heavily marked with purple. The inflorescence, which is produced on a short peduncle, has a pedicel up to 35 mm in length. The flower is up to 100 mm in diameter. The face is transversely ridged, creamy to yellowish with a heavy covering of linear coalesced dots, somewhat absent towards the centre. The lobes are often densely fringed with short dark cilia along the edges. The centre is dominated by a heavy, sharply-deflexed annulus.

Distribution: Endemic to the NW Cape and not recorded N of the Orange River. It occurs from just S of Kubus in the Richtersveld to S of Springbok, but not E of Concordia. It occurs near to Port Nolloth, but is generally very rare on the coastal sandveld.

Orbea paradoxa **(Verdoorn) Leach** This species forms small clumps up to 15 cm in diameter. The grey-green, mottled purple, stems are up to 55 mm long. The marginal teeth are long and fairly upright, with several tiny denticles near their apex. The inflorescence arises from a short peduncle from near the base. The very evil-smelling flowers are produced facing upwards on pedicels up to 10 mm long. The face of the campanulate flower is up to 30 mm in diameter, is creamy-white with linear reddish markings which are sometimes absent, sometimes lightly marked and sometimes almost unicoloured on the small shallow annulus. The tube is sharpish-edged, disappearing abruptly in a steep-sided bowl which is dark reddish and lined with longish bristles. The lobes have clavate, vibratile cilia lining the edge to halfway towards the outside.

Distribution: This unusual species occurs in a narrow band on the sides of the Lebombo Mountains in Swaziland and South Africa from near Pongola in the south to as far north as east of Malelane and eastwards narrowly into Mozambique.

Orbea pulchella **(Masson) Leach** This species forms clumps up to 30 cm in diameter and is not rhizomatous. The green stems with purple mottling are up to 9 cm long. The inflorescence arises from a short peduncle, with the pedicels short to longish, up to 30 mm in length. The flowers are up to 45 mm in diameter. The face is without papillae and the edges of the lobes are eciliate, except that the base of the tube has a ring of long bristles. The whitish to yellowish face is transversely rugose with small irregular spots covering the face.

Distribution: Occurs from around Port Elizabeth and also to S of the Zuurberg.





Orbea pulchella in cultivation *Photo* Left *Loukie Viljoen. Photo* Right: *Rob Nagel*

Orbea rangeana **(Dinter & A. Berger) Leach** This species is similar to *O. maculata*, but the differences have been shown to be sufficient to retain it as a full species. The plant consists of small clumps up to 6 cm in diameter. The stems are upright, green with prominent purple markings and with narrow, obtuse marginal teeth. The inflorescence is produced near the base of the stem and produces up to 3 flowers borne on decumbent pedicels of up to 45 mm in length. The starfish-like flowers, which lie flat on the ground, are up to 70 mm in diameter. The almost linear lobes are long, giving an impression of being wider in the middle than at the sinuses. The inside colour is creamy-white to pale yellow with lateral linear reddish spots. The edges are fringed with reddish clavate cilia.

Distribution: This species is endemic to Namibia and is found mainly on the higher ground in a band from the Brandberg in the NW to the Great Karas Mountains in the SE.



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Loukie Viljoen

1 - 3. ***Orbea namaquensis*** (1 & 2) in habitat south of the Tatasberg, Richtersveld National Park.
(3) In cultivation
4 & 5. ***Orbea rangeana*** (4) 'Nabibis', Tiras Mtns., 70 km N Aus, Namibia
(5) in cultivation.
6 & 7. ***Orbea paradoxa***
(6) in cultivation.
(7) In cultivation from Makatini, N KwaZulu-Natal,



Darrel Plowes

Inge Pehlemann-Brase



Loukie Viljoen

Darrel Plowes





ORBEA SPECIOSA **Leach** This is the other species with *O. doldii* which has been placed in synonomy with *O. macloughlinii*. Until this has been conclusively proved otherwise, this book cannot recognise this transfer. The stems are up 10 cm long with longish marginal teeth. The inflorescence is one per stem, near its base, with up to 3 flowers being produced. The flowers are up to about 50 mm, with a small annulus surrounding the corona. The colour is yellowish with brownish to reddish linear irregular elongated dots, sometimes fairly narrow to very broad and sometimes unicoloured. The ends of the lobes are frequently faded to unicolour. The margins are densely fringed with long clavate, vibratile cilia.

Distribution: The species has a limited distribution some 60 km N of Mthatha in the E Cape.

ORBEA TAPSCOTTII **(I. Verd.) L.C. Leach** This is a dense-clump forming, erect species with stems up to 11 cm tall. The stems have long marginal teeth and are green with brown or purple patches. One inflorescence per stem is produced from near the base with short pedicels tending upwards with the flowers facing upwards. The flowers are up to 5 mm in diameter, with a small annulus. The colour is dark purple to reddish brown. The inner surface of the corolla is transversely rugose. The rugosities are marked with whitish flecks, with the white marking much denser on the annulus.

Distribution: This is a fairly common species with a wide distribution in E Botswana from Palapye on the N, southwards to S of Lobatse. From just N of the Soutpansberg to N of Warmbaths in South Africa.

ORBEA UMBRACULA **(M.D. Henderson) L.C. Leach** This floriferous species forms small clumps of erect to sub-erect stems which are armed with long ascending tubercles. The colour is greyish– green flecked with purple. Flowers are produced on upright pedicels 15–35 mm from the basal half of the stems. The corolla lobes are strongly reflexed with the corona perched on a prominent annulus. Flower colour ranges from yellow with the inner parts to half of the lobes red and red striations on the apical half of the lobes to almost uniform brick red with a few yellow striations on the apical half of the stems.

Distribution: This interesting species occurs S of Mutare in Zimbabwe, southwards towards Ghonarezhou National Park. Also found near the coast around the mouth of the Save River.

ORBEA VARIEGATA **(L.) Haw.** This species is the best-known orbea and is commonly found in collections and is very easy to grow. It is probably the first stapeliad found in South Africa as it is common in and around Cape Town. Early botanists had a great time in describing 'new species' of this plant and as many as 40 were described, only to have them being subsumed into synonymy with *Orbea variegata,* The plant forms clumps which may in certain circumstances be as large as nearly a metre in diameter. The stems are up to 12 cm long and are green with purple mottling. The inflorescence is one per stem near the base and a few flowers arise on short pedicels with the flowers facing horizontal to semi-erect to flat on the ground. The flowers are very variable in colour and markings and are up to 70 mm in diameter, transversely rugose and are pale creamy yellow, lightly to very heavily marked with fine to coarse elongated spots in deep purple to pale red. The centre of the flower is dominated by a large annulus which is of a lighter colour than the lobes.

Distribution: Widespread and common in the SW Cape from Kleinmond in the S to Lamberts Bay in the N. It occurs on the S side of the Langeberge extending to as far E as Mossel Bay. They are also found N of St Francis Bay.

ORBEA VERRUCOSA **(Masson) Leach** This species has two subspecies. It forms small clumps of decumbent stems up to 9 cm long. They are green and mottled with purple brown. The inflorescence produces up to 3 flowers, with pedicels up to 25 mm long, from a short peduncle. The flowers are produced horizontally to ascending. They are yellowish-cream with fine to coarse irregular dots and transversely rugose. The centre of the flower has a small annulus which is usually darker than the limb and lobes. Subspecies *fucosa* differs in its smaller more purple flowers and marked difference in its coronal structure.

Distribution: Widespread, occurring from about Mthatha in the E Cape, across to Aliwal North and southwards to East London, Port Elizabeth and across to Oudtshoorn. The rare subspecies *fucosa* is limited to a small area SE of Mount Ayliff in the E Cape.


1

Tim Peatling


2

Loukie Viljoen


3

Darrel Plowes


4

Darrel Plowes


5

Loukie Viljoen


6

Robin Frandsen


8

Loukie Viljoen


9

Darrel Plowes


7

Tim Peatling

1 - 3. ***Orbea speciosa*** (1) (type plant, L.) With the closely related *Orbea macloughlinii,* (R). (2 & 3) In cultivation
4 & 5. ***Orbea tapscottii*** in cultivation, from a plant 11km N of Matete, Botswana
6 & 7. ***Orbea umbracula*** (6) in habitat about 40km south of Mutare, Zimbabwe (7) in cultivation at Mutare

Niels Jacobsen

8. ***Orbea verrucosa*** in cultivation
9. ***O. verrucosa* subsp. *fucosa*** in cultivation
10 - 12. ***Orbea variegata*** (10) in habitat at Great Brak River, southern Cape. (11) in cultivation. Colour variation. (12) in cultivation


10


11

Loukie Viljoen

Tim Peatling


12

ORBEA WOODII **(Masson) Leach** This species is non-rhizomatous, forming clumps of erect to decumbent stems up to 5 cm long. The stems are green and mottled with purple-brown. up to 6 flowers form on a fairly large peduncle near the base of the stem. Purple to purple-brownish flowers with occasional fine elongated dots face upward. There is a prominent but smallish annulus. Lobe margins are densely ciliate with long clavate, vibratile cilia along the lobe margins except near the tips.

Distribution: Sparsely distributed around the Estcourt area, towards Weenen and northwards towards Dundee and Ladysmith in KwaZulu-Natal.

ORBEANTHUS Leach

This very distinctive genus has previously been included under *Orbea*. The plants are however very radically different and in my and other's opinion and with good taxonomic reasons, certainly warrants its own generic level.

ORBEANTHUS CONJUNCTUS **(White & Sloane) Leach** This species forms sprawling mats on long thin stems up to 20 cm long. and is sometimes found with the long stems hanging down rock faces. The stem colour is green with purple mottling. The plant is not rhizomatous but forms roots readily where the stems touch the ground. The inflorescence develops near the base of the stems with one sometimes more flowers, which tend slightly upwards, on a short pedicel. The outside of the bicampanulate flowers is pale cream, pale pink sometimes with pale pinkish veining. The inside is creamy-white, with a bright shiny red annulus and a most distinctive corona.

Distribution: A fairly common species in its limited range on the Soutpansberg; from Vivo in the W to NW of Sibasa in the Limpopo Province.

ORBEANTHUS HARDYI **(R.A. Dyer) Leach** Like the previous species, *O. hardyi* is a sprawling plant producing mats up to 1 m in diameter which sometimes sprawl down rock faces. The stems of this plant tend to be longer than those of *O. conjunctus* and are up to as long as 30 cm. The stems are greenish with purple mottling. The inflorescence is usually produced near the base with up to 2 flowers which face downwards, horizontally or slightly upwards on a short pedicel. The flowers are up to 75 mm in diameter, and are very shallowly bicampanulate with a large annulus, pale creamy-white in the inside heavily marked with irregular spots, more heavily marked on the sides and somewhat inward of the annulus.

Distribution: Occurs along the middle reaches of the Olifants River W of the Drakensberg and between Ohrigstad and Mashishing (Lydenburg) in Mpumalanga.

ORBEOPSIS Leach

This genus has fairly recently been lumped together with *Orbea* by the taxonomists who say that it fits within the clades with *Orbea*. *Orbea* normally only has one flower open at a time in a cyme, each usually with an annulus, and usually only 2-3 flowers of very different ages in the inflorescence, whereas *Orbeopsis* usually has many flowers per basal pseudo-umbel which are without an annulus, They open nearly simultaneously. Three significant morphological differences are normally regarded as adequate for separate generic status.

ORBEOPSIS ALBOCASTANEA **(Marl.) Leach** This charming species is a mat-forming plant which is sometimes rhizomatous. The dense mats, can on occasion, grow up to a half metre in diameter. The pale green stems are sometimes mottled with purplish-red and are up to 7 cm long and fairly stout. The inflorescence rises from a longish peduncle with as many as 25 flowers which are borne on long pedicels up to 50 mm in length and which open almost simultaneously. The flowers are up to 30 mm in diameter, flattened or slightly deflexed with a shallow tube. The face is rugulose-papillate, white or very faintly tinged with yellow, with irregular purplish to reddish dots. The corolla edges are fringed with clavate, spathulate cilia. Can easily be confused with *O. knobelii.*

Distribution: This attractive species is endemic to Namibia, occurring in the Great Karas Mountains in the S and rather disjunctly at the base of the Naukluft Mountains to W of Maltehöhe.



Darrel Plowes



Tim Peatling



Bert Polling



Loukie Viljoen



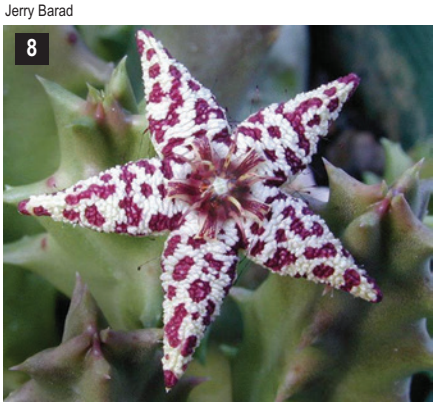
Robin Frandsen

1 & 2. ***Orbea woodii*** (1)12 km E Estcourt, KwaZulu-Natal
(2) in cultivation
4. ***Orbeanthus conjunctus*** in cultivation.
5 & 6. ***Orbeanthus hardyi*** in cultivation:
7 - 9. ***Orbeaopsis albocastanea***
(7) in cultivation from a plant 50 km S of Maltehöhe, Namibia
(8 & 9) In cultivation

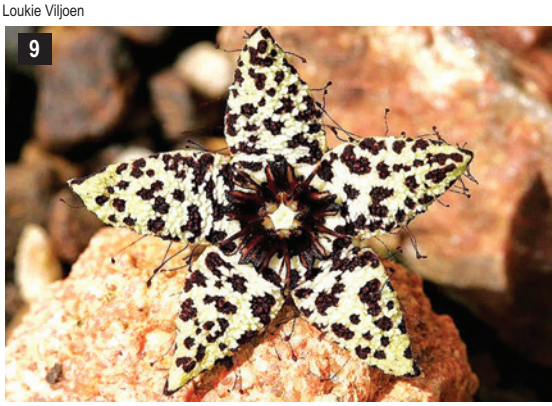
Darrel Plowes



Jerry Barad



Loukie Viljoen



Orbeopsis caudata **(N.E. Br.) Leach** This species has two subspecies with only the subsp. *rhodesiaca* being found in the regions dealt with here. The subspecies *caudata* occurs in Zambia, northern Mozambique and Malawi. The subspecies *rhodesiaca* is a small succulent forming dense to diffuse clumps up to 35 cm in diameter. The stems are green, sometimes finely flecked with purplish-red. They are erect to decumbent, slender and up to about 15 cm tall with long sub-erect teeth. The inflorescence is produced on the upper half of the stems, with up to 8 flowers opening up almost simultaneously. The campanulate, almost flat flowers, which are very malodorous, are bright yellow with small irregular reddish spots, more dense in the inside of the centre. The lobes are long and slightly reflexed. *Subspecies* rhodesiaca *has recently been elevated to full species rank as* O. chibensis (*C.A. Lückhoff*) *Plowes.*

Distribution: Widely distributed across Zimbabwe, most densely S and W of Mutare, to N of Harare and across to the Caprivi Strip in NE Namibia. I have seen it in the N Kruger National Park, but I imagine it is an escapee from cultivation.

Orbeopsis gerstneri **(Letty) Leach** The rare, little-known small, rhizomatous sub-species *gerstneri,* forms dense clumps. The stems are up to 10 cm. The rhizomes are sometimes as long as 10 cm where they emerge and develop a new plants. The stems are dark green sometimes mottled with purple. The inflorescence is produced on a short peduncle from anywhere along the stem. The flowers are borne on longish pedicels with up to 8 flowers being produced which open almost simultaneously. The flowers are up to 60 mm in diameter, rotate. campanulate. The inner surface is rugulose, papillate, mottled with reddish-purple irregular spots on a creamy background, but very heavily marked in the tube. The margins near, but not at the sinuses, for only a short distance, have short, purple clavate vibratile cilia. The subspecies *elongata* varies in its much larger clumps, which can be up to 1 m in diameter, shorter and stouter stems and longer, narrower corolla lobes and deeper tube. *The subspecies* elongata *has recently been elevate to full species rank as* O. elongata (*R.A. Dyer*) *Plowes.*

Distribution: The subspecies *gerstneri* has a limited distribution from Ingwavuma in N Zululand, narrowly into Swaziland and southwards to S of Pongola in south eastern Mpumalanga. The subspecies *elongata* is found near Penge, the type locality, eastwards to along the Olifants River and its tributary the Blyde River,

Orbeopsis huillensis **(Hiern) Leach** Two subspecies are recognised for this species: subsp. *huillensis* and subsp. *flava.* This nominate subspecies *huillensis* does not form rhizomes, but forms very large clumps up to 3 m in diameter. The decumbent to erect stems, which grow as tall as 30 cm—50 cm, are striking in appearance with their sharp-angled margins and broad flattened conical teeth. Their colour is grey-green marbled with purple. The inflorescence is produced from the base on long pedicels bearing a cluster of as many as 40 very smelly flowers. The flowers, which are similar to those of *O. lutea*, are up to 60 mm in diameter, rugulose, papillate, reddish to brick-red, without marginal cilia. The subsp. *flava* varies in that the stems and teeth are smaller. The plant frequently produced rhizomes. The flowers are yellow, edged with with sparse vibratile clavate cilia. *Subspecies* flava *has recently been elevated to full species rank as* O. flava (*Bruyns*) *Plowes.*

Distribution: The subspecies *huillensis* occurs E of Tsumeb in Namibia and further E near the Botswana border. It also appears W of Bulawayo in Zimbabwe. Subspecies *flava* occurs at two localities, some 180 km NE of Grootfontein.

Orbeopsis knobelii **(E. Phillips) Leach** Easily mistaken for *O. albocastanea,* this rhizomatous plant forms dense mats up to 1 m in diameter, the flowers of the two species are fairly similar at first glance. The stems are however quite different, with the teeth being broadly obtuse as opposed to the long ascending tubercles of *O. albocastanea*. The corolla lobes are broader, but also have the long clavate, spathulate cilia on the edges. The face of the flowers is rugulose, papillate and finely to fairly coarsely covered with reddish markings.

Distribution: Found only in the Kalahari Desert from near Ghanzi in the W across to near Gaborone in Botswana and then southwards towards SE of Upington in South Africa.

Orbeopsis lutea **(N.E.Br.) Leach** Two subspecies: subsp. *lutea* and subsp. *vaga* are recognised: Subspecies. *lutea* is one of the best-known of the Stapeliads. Its very smelly, umbels of flowers, its common occurrence and ease of cultivation makes it a common plant in collections. Forms large mats, up to 1 m in diameter. The stems are up to 14 cm long and strongly toothed, pale green often with purple markings. Flowers are up to 60 mm in diameter with long, narrow lobes which are



Darrel Plowes



Tim Peatling



Dennis de Kock



Darrel Plowes



Loukie Viljoen



Dennis de Kock



Tim Peatling



Darrel Plowes



Dennis de Kock

1 & 2. ***Orbeopsis caudata* subsp. *rhodesiaca*** (1) in cultivation from a plant from Godikwe, Okavango Swamps, Botswana
(2) In habitat at Chirorwe, 60 km NW of Birchenough Bridge, SE Zimbabwe
3. ***Orbeopsis gerstneri*** in cultivation from a plant from Enseleni, near Empangeni, KwaZulu-Natal
4 & 5. ***O. gerstneri* subsp. *elongata*** in cultivation. This species has recently been elevated to species rank as *O. elongata.*

6 & 7. ***Orbeopsis huillensis*** in cultivation
8. ***O. huillensis* subsp. *flava*** from 145 km NE Grootfontein, Namibia. This subspecies has been elevated to species rank as *O flava*
9. ***Orbeopsis knobelii*** Sekhuma Pan, 150 km W Kanye, Botswana
10 & 11. ***Orbeopsis lutea*** (10) Hopetown, N. Cape Province. (11) in cultivation.
12. ***O. lutea* subsp. *vaga*** in habitat at N of Ondjiva, Cunene Province, Angola. This subspecies has been elevated to species rank as *O. vaga*

Darrel Plowes



Dawie Malan



Tim Peatling



sparsely fringed with dark purple clavate vibratile cilia. The colours range from bright clear yellow through orange to brick red. The yellow outer corona lobes are striking against the darker-coloured flowers. The flowers are borne on long pedicels and are produced on a short peduncle: up to 30 flowers are produced and they open almost simultaneously. Subspecies *vaga* has very striking flowers: they are brightly mottled brick-red to deep maroon with yellow speckling, usually over the whole face but sometimes less to absent towards the tips. *Subspecies* vaga *has recently been elevated to full species rank as* O. vaga (*N.E. Br.*) *Plowes*

Distribution: Subspecies *lutea* is found from near Douglas in the northern Cape to E of Bloemfontein, northwards to E of Pretoria, northern and southern Kruger National Park and in central KwaZulu-Natal in South Africa, in W Zimbabwe, in Botswana near the Makgadikgadi Pan and southwards to S of Gaborone. Subspecies *vaga* occurs in central Namibia from Ovamboland in the N to the Great Karas Mountains in the S and narrowly into South Africa where it is recorded near Pofadder.

ORBEOPSIS MELANANTHA **(Schlecht.) Leach** This is a clump-forming large species, forming clumps up to 1 m in diameter. The stocky decumbent to erect stems, which are pale green, mottled with purple, are up to 8 cm tall. The angles are pronounced with strong, deltoid teeth. The inflorescence is produced on a long, stout peduncle from which arises up to about 15 very smelly flowers on a longish pedicel. The flowers are produced almost simultaneously and are up to 60 mm in diameter. The face is deep red-brown, through reddish to very dark red. The surface is densely papillate with a short bristle on each papilla.

Distribution: Occurs from N of Pretoria to S of the Soutpansberg, across to Alldays and southwards to near Pilanesberg. In the E it occurs near Groblersdal. Also found near the coast, just N of Maputo and narrowly inland.

ORBEOPSIS TSUMEBENSIS **(Oberm.) Leach** This little-known species is clump-forming with stems decumbent to erect. The stems are up to 25 cm tall, pale green, spotted with red. The inflorescence is many-flowered from the base of the stems on pedicels up to 15 mm long. The campanulate evil-smelling flowers are up to 40 mm in diameter, transversely rugose and deep chocolate-brown and velvety. The corolla lobes are eciliate.
Distribution: Near the town of Tsumeb in Namibia, where it has been introduced into some of the gardens of the town.

ORBEOPSIS VALIDA **(N.E. Br.) Leach** Forms diffuse clumps up to 70 cm in diameter. The pale green, purple-mottled stems are up to 20 cm long with broad, flattened ascending marginal teeth. There are two subspecies: *valida* and *occidentalis* Bruyns. The inflorescence is formed from near the base or neat the apex of the stems from a stout peduncle. The very smelly transversely rugose flowers are borne on pedicels up to 40 mm long with as many as 40 flowers. The flowers are deep maroon to pinkish-red and are up to 50 mm in diameter. The lobes are fringed with long, white clavate, vibratile cilia. The subsp. *occidentalis* varies from the nominate subsp. *valida* by its much more slender stems, it is rhizomatous, whereas the nominate subspecies is not, the flower colour is lighter and more pink and the tube is much shorter and the marginal cilia are red rather than white. *Subspecies* occidentalis *has recently been elevated to full species rank as* O. occidentalis (*Bruyns*) *Plowes.*

Distribution: The subspecies *valida* occurs along the Kavango River in W Caprivi and into neighbouring Botswana and east-wards near Pandamatenga at the W part of Lake Kariba and also near Gweru in Zimbabwe. The subspecies *occidentalis* occurs from E of the Waterberg in Namibia, eastwards towards Botswana, near to Ghanzi.

PACHYCYMBIUM **Leach**

This genus has previously been included in the genus *Orbea*. Clearly it should remain a separate genus in its own right. The transfer on the slavish basis that it fall within the parameters of a clade, goes against clear understandings of taxonomic classification. The very appearance of the flowers of its three species is very similar in character; the coronal structures are so alike within the three species that they clearly must remain within their own genus.

PACHYCYMBIUM CARNOSUM **(Stent.) Leach** A dwarf species consisting of several small dense clumps inter-connected by a long rhizome. The whitish-green, purple-mottled stems are 13 cm in length with large deltoid marginal teeth. The inflorescence is a few to many per stem with flowers on very short pedicels on the upper parts of the



Darrel Plowes



Loukie Viljoen



Tim Peatling



Tim Peatling



Darrel Plowes



Loukie Viljoen

1 - 3. ***Orbeopsis melanantha*** (1) in cultivation from a plant from Boyne, 35 km W of Polokwane, Limpopo Province. (2) Colour variation. (3) In cultivation
4. ***Orbeopsis tsumebensis*** in cultivation
5. ***Orbeopsis valida*** in cultivation from a plant from Dambwe Forest Reserve, near Livingstone, Zambia

6 - 8. ***Pachycymbium carnosum*** in cultivation (7) a plant from Melkrivier, 40 km N Vaalwater, Limpopo Prov.(8) a plant from Mogul Nat. Res., Magaliesberg, Rustenburg

Darrel Plowes



Darrel Plowes



stems. Flowers are up to 18 mm in diameter, campanulate and fleshy, irregularly rugose, with the inside face white to pale yellow marked with irregular reddish to purplish spots and strongly papillate. The lobe margins are eciliate.

Distribution: This is a species which is restricted to an area between Polokwane and Lephalale (Ellisras) in an area N of the Waterberg in Limpopo Province.

PACHYCYMBIUM KEITHII **(R.A. Dyer) Leach** This dwarf species consists of several small dense clumps inter-connected by long rhizomes. Stems are 13 cm in length and have large deltoid marginal teeth. They are whitish-green to green with purple mottling. The inflorescence is a few to many per stem with the flowers being produced on very short pedicels on the upper parts of the stems. The flowers are smaller than *P. carnosum*—up to 8 mm in diameter, with the lobes more ascending. Their colour is reddish to purple with whitish sub-linear marking along the rugosities. lobe margins have stiff clavate cilia.

Distribution: This is a widespread species, occurring from Harare, SE to Mutare, towards Beitbridge, southwards towards Polokwane and eastwards to above the Mpumalanga escarpment, E of the Lebombo Mountains in N Zululand and in KwaZulu-Natal, S of Pongola.

PACHYCYMBIUM LANCASTERI **Lavranos** This rare and virtually unknown species is vegatatively similar to the other *Pachycymbium* species. The flowers are, however, dissimilar: the small flowers, up to 8 mm in diameter, have a conspicuous annulus. The lobes are more spreading and the surface of the flower is heavily rugulose and ciliate. The colour ranges from pure, bright yellow to brick-red.

Distribution: Known from the region of the Letaba River in the Kruger National Park.

PECTINARIA Haw.

This genus comprises plants which favour darker places, with small flowers close to or even under the ground. Their pollinators are generally the creeping insects, such as ants, small flies and even beetles. The stems are short and stubby, prostrate becoming decumbent. The genus *Huerniopsis* has erroneously been included under this genus

PECTINARIA ARTICULATA **(Aiton) Haw.** Stems short, sometimes somewhat elongated up to 10 cm long, prostrate usually upturned at the apex, pale to darker green. The inflorescence is borne on a short, curious 'S'-shaped pedicel which holds the flower upwards. The flowers are cup-shaped, tiny — up to 8 mm in diameter, the outside is papillate, bright yellow, green to purple and the inside is bright yellow, green to dark purple, densely covered with blunt glistening white papillae. The lobes remain connivent.

Distribution: Occurs on the Roggeveldberge escarpment from the Hantam Mountains in the N to N and E of Sutherland and SW of Fraserburg.

PECTINARIA ASPERIFLORA **N.E. Br.** Stems, similar to the previous species are short, somewhat elongated, prostrate usually upturned at the apex, pale to darker green. The flowers are up to 10 mm in diameter, less cup-shaped and more conical with the lobes longer, less channeled but also always connivent. The outside is papillate, yellow to dark purple and the inside is yellow to dark purple and very densely covered with glistening blunt white papillae.

Distribution: Occurs in the SE edge of the Ceres Karoo, and from about Matjiesfontein to near Merweville and in the W Little Karoo.

PECTINARIA BOREALIS **(Bruyns) Plowes** The stems and plant form of this rare species is similar to the aforegoing pectinarias. The flowers are most similar to *P. namaquensis*, with the base of the flower being almost flat. The papillae on the inside surface is usually the same as the outer surface but may be white and shiny. The flowers are usually held upwards by their bent pedicels.

Distribution: On higher ground in the Richtersveld from Helshoogte in the N to east of Eksteenfontein in the south.

PECTINARIA NAMAQUENSIS **(N.E. Br.) Plowes** This plant's stems and vegetative habit is similar to the other pectinarias. The flowers however are produced on varying-length pedicels facing downwards, upwards or sideways. The flowers are up to 4 mm broad, are conical. The inside



Dennis de Kock



Unknown



Dennis de Kock



Loukie Viljoen



Martin Heigan



Dennis de Kock



Loukie Viljoen

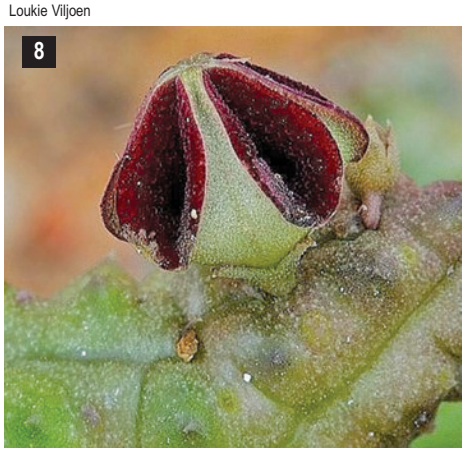
1. ***Pachycymbium keithii*** in cultivation
2. ***Pachycymbium lancasteri*** Two clones in cultivation showing the colour variation. The yellow form was the first discovered but has apparently not been seen again in nature
3 & 4. ***Pectinaria articulata*** in cultivation showing colour variation

5 & 6. ***Pectinaria asperifolia*** in cultivation
7 & 8. ***Pectinaria borealis*** in cultivation showing the chrystalline papillae in the inside of the flower
9 & 10. ***Pectinaria namaquensis*** in cultivation

Loukie Viljoen



Loukie Viljoen



Tim Peatling



colours are dark reddish-purple to greenish to pale yellow, the surface is covered with lighter-coloured papillae than the base surface colour.

Distribution: This species occurs mainly in W Bushmanland from Gamoep to S of Leliefontein. It also occurs near Loeriesfontein and NE of Springbok.

PIARANTHUS R. Br.

The plants of this genus are typical in appearance and habit and any attempts to subsume the species of *Huerniopsis* into *Piaranthis* is inexplicable. The structures of the two genera do not justify this. The flowers of *Piaranthus* are inclined to be very malodorous and none of the flowers are non-malodorously scented, whereas the flowers of the genus *Huerniopsis* are sweetly-scented and are geared for pollination at night by an entirely different race of insects such as moths.

PIARANTHUS BARRYDALENSIS **Meve** The stems are up to 3 cm long, sub-globose to cylindric. Their colour is light grey-green to green. 1–2 flowers are produced on the upper half of the stem on pedicels up to 12 mm in length. The flowers are up to 25 mm in diameter. Their colour is white to ivory with red to dark red transverse lines. They are sweetly-malodorous.

Distribution: From Montagu across to E of Barrydale, as far E as Muiskraal in the S Little Karoo.

PIARANTHUS COMPTUS **N.E. Br.** The stems are sub-globose, up to 5 cm long, green to dark grey-green. The flowers are produced from the upper parts of the stem with 1-10 being produced on pedicels up to 14 mm in length. They are campanulate to rotate. The insides are ivory-coloured, rarely palest cream-brown, with red to red-brown transverse lines of dots, with the surfaces with short acute cilia. The flowers from some areas have a few marginal adaxial clavate cilia.

Distribution: Rarely near Nelspoort, NE of Beaufort West and southwards. The main concentration is from Sutherland, eastwards beyond Merweville and S to Laingsburg and across to Prince Albert.

PIARANTHUS DECORUS **N.E. Br.** Two subspecies are recognised: subsp. *decorus* and subsp. *cornutus*. The stems are sub-globose to cylindric, up to 5 cm long, green to dark grey-green. The flowers of *P. decorus* are produced near the apex of the stems on pedicels up to 20 mm long. Flowers are rotate and shallowly campanulate. The face is covered with short acute papillae and is pale green-yellow to creamy with light to dark red to brownish red transverse lines and dots. The subspecies *cornutus* varies from the nominate species in its coronal structure and the plainer, less intense colour, to even uni-coloured, inner corolla lobes. *The subsp.* cornutus *has recently been returned to its own species rank* - P. cornutus *N.E. Br.*

Distribution: The subspecies *decorus* occurs from the E of the Hantam Mountains near Calvinia, along the W edge of the Roggeveld Mountains, across to Fraserburg and sporadically near Beaufort West, then southwards to Matjiesfontein, Laingsburg. The subspecies *cornutus* occurs from N of the Knersvlakte, through Gamoep, to Pofadder and northwards to the Great Karas Mountains in Namibia across to Ais-Ais and northwards to Witputs.

PIARANTHUS FRAMESII **Pillans** The stems are up to 9 cm long and are sub-globose to cylindric, rarely somewhat clavate. Their colour is green to purplish green. Flowers are borne nearly at the apex of the stems on pedicels up to 20 mm long. The flowers are up to 20 mm in diameter and are patterned with light to heavy brick-red to reddish transverse lines and dots, densely covered with short acute papillae. The tube is deeper than the other species and sometimes conspicuously pentagonal.

Distribution: The species occurs from N of Loeriesfontein, S to Calvinia and across to Nieuwoudtville in the NW Cape.

PIARANTHUS GEMINATUS **N.E. Br.** This species has two varieties: var. *geminatus* and var. *foetidus*. The stems are sub-globose to cylindric and are pale to dark grey-green. The flowers are borne on short pedicels from near or at the apex of the stems. The variation in the appearance and colours of the flowers of this species is bewildering. The accompanying photographs clearly indicate this. The flowers of var. *geminatus* are pale cream to yellow variously lightly to heavily marked with yellow to deep



Loukie Viljoen



Loukie Viljoen



Darrel Plowes



Darrel Plowes



Darrel Plowes



Darrel Plowes



Darrel Plowes



Darrel Plowes



Loukie Viljoen

1 & 2. ***Piaranthus barrydalensis*** in cultivation
3 & 4. ***Piaranthus decorus* subsp. *decorus*** in cultivation. Now transferred to a new species, *P. erratus* Plowes, from plants from Blouheuwel, Tanqua River, 12 km S Ouberg Pass
5 - 7. ***P. decorus* subsp. *cornutus*** in cultivation (now returned to *P. cornutus*). (7) a plant from 23 km W Platbakkies, N Cape
8. ***Piaranthus framesii*** in cultivation from a plant near Loeriesfontein, N. Cape
9 - 11. ***Piaranthus comptus*** in cultivation.
12 & 13. ***Piaranthus geminatus*** in cultivation showing colour variation
14 & 15. ***P. geminatus* subsp. *foetidus*** in cultivation (now returned to *P. foetidus* N.E. Br.) (14) a plant from 12 km N Kendrew, (15) 25 km N Aberdeen



Loukie Viljoen



Michael Monnier



Michael Milanovich



Darrel Plowes



Loukie Viljoen



Darrel Plowes

purple transverse lines or spots or completely unmarked. Flowers are up to 30 mm in diameter. In the variety *foetidus* the flowers are densely felted with the transverse lines somewhat coalescing at the tips of the lobes. The flowers are sweetly very malodorous.

Distribution: The variety *geminatus* occurs in the Little and Great Karoo. It is common across the entire Little Karoo and the S Great Karoo, from Steytlerville in the Great Karoo across to East London in the E Cape and northwards to Cradock and across to Queenstown in the E Cape. The variety *foetidus* is a more westerly-occurring species and is found mainly in the W Little Karoo and more rarely in the Great Karoo from Prince Albert to Beaufort West.

PIARANTHUS PARVULUS **N.E. Br.** This distinctive species has the smallest flowers of the genus with small sub-globose green to grey-green stems up to 7 cm long. The inflorescence is produced on a peduncle at the apex of the stem, bearing up to 10, rarely more, flowers on a short pedicel. The flowers are very small, up to 13 mm in diameter. The lobes are narrow and are inclined to reflex. Their colour is pale whitish-yellow to pale yellow with indistinct lateral pale reddish dots.

Distribution: Occurs in the S Ceres Karoo across to Laingsburg and northwards into the Moordenaars Karoo to Merweville.

PIARANTHUS PUNCTATUS **(Masson) Schult.** The stems of this species are up to 10 cm long, sub-globose to cylindric, sometimes clavate. The angles are generally more strongly angled. Their colour is green. The inflorescence is produced on the upper half of the stems on a short pedicel. The flowers are campanulate with a fairly deep tube, which is often quite noticeably pentagonal, up to 9 mm in diameter. Their colour inside is white to cream patterned with red, red-brown or brown dots, patches and transverse stripes. The surface is papillate.

Distribution: Occurs in Namaqualand in the Northern Cape Province mainly in the Knersvlakte. Then northwards to Garies and across the Khamiesberge Mountains to Loeriesfontein and southwards on the dry plateau towards Nieuwoudtville.

QUAQUA N.E. Br.

This genus is erected for the stapeliads which are non-rhizomatous, 4–5–angled stems the tubercles of which are usually tipped with a conspicuous hard, horny pungent spike. It is difficult to root side cuttings or even the central stem. This is mainly a winter-rainfall area inhabitant, particularly favouring arid conditions.

QUAQUA ACUTILOBA **(N.E. Br.) Bruyns** A clump-forming decumbent to erect small succulent with green stems, sometimes suffused with brown, up to 175 mm tall. The inflorescence produces up to 3 flowers on very short pedicels near the tips of the stems. The flowers are rotate, somewhat campanulate and up to 10 mm in diameter. The colour is pale yellow, sometimes completely unmarked but more commonly heavily marked more so towards the ends of the lobes, where they are sometimes solid reddish-purple or heavily spotted with irregular markings. The lobes are eciliate.

Distribution: Very widely distributed from Aus in Namibia to Karoopoort in the S Ceres Karoo. The line of distribution is along the edge of the winter rainfall, generally on the higher areas away from the coast.

QUAQUA ARENICOLA **(N.E. Br.) Plowes** This robust species forms dense large clumps up to about 50 cm in diameter. The stems are decumbent to erect, green to greenish-purple. The inflorescence is produced on mainly on the lower parts of the stem, but not exclusively so. The flowers are produced on short pedicels with up to >15 flowers opening almost simultaneously. The flowers are up to 30 mm in diameter, are campanulate and are dark red in colour with a characteristic single or double ring-like marking on the inside of the tube. The lobes are attenuate with the edges reflexed.

Distribution: This species has a scattered distribution across from W of Worcester to near Willowmore. It is also recorded from near Uniondale.

QUAQUA ARIDA **(Masson) Plowes** This species forms small clumps of decumbent to erect stems up to 17cm long. Their colour is green sometimes with purple markings. The inflorescence is produced on the upper parts of the stems with up to 3 flowers opening successively. The flowers are



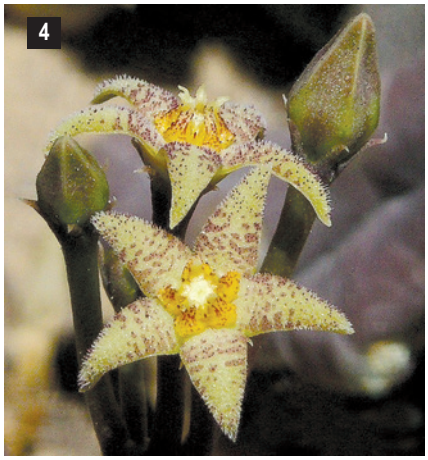
Loukie Viljoen



Loukie Viljoen



Tim Peatling



Dennis de Kock



Darrel Plowes



Horst Burba



Loukie Viljoen

1 - 3. ***Piaranthus punctatus*** in cultivation
4 & 5. ***Piaranthus parvulus*** in cultivation
6. ***Quaqua acutiloba*** in cultivation
7 & 8. ***Quaqua arenicola*** in cultivation
(8) From a plant from Brakwater, between Willowmore & Uniondale:
9 - 11. ***Quaqua arida*** (9) in habitat in the southern Ceres Karoo. (10) With the lobes not yet reflexed. (11) With the lobes fully reflexed



Darrel Plowes

Rob Nagel



Rob Nagel



John Frew



borne on a long pedicel, up to 15 mm, and the little flowers are up to 6 mm in diameter. The face is bright yellow with the tips of the lobes a solid reddish colour and the rest of the facial surface covered with irregular reddish dots and with long stiff hairs. The lobes roll back. The lobes are eciliate.

Distribution: This is a widespread species which is patchily distributed from Loeriesfontein in the N, along the Roggeveld escarpment to near Fraserburg, southwards to Prince Albert and across to near Touws River.

QUAQUA ARMATA **(N.E. Br.) Bruyns** This very robust species forms large clumps, up to half a metre in diameter. The hard stems are up to 20 cm in length, thick with pungent robust deltoid teeth. They are grey-green and are mottled with purple. The inflorescence is produced in clusters of up to 10 flowers. These are borne on very short pedicels towards the apex of the stems. The flowers are up to 25 cm in diameter, campanulate with reflexed lobes. Their colour is yellow, sometimes almost completely unicoloured in purple with a lighter colour towards the centre or heavily spotted in brownish to reddish irregular spots towards the outer lobes and also more heavily marked in the tube. They are usually glabrous but occasionally with short bristles at the mouth of the tube.

Distribution: Near the coast but mainly inland from Springbok in the N, to NE of Lamberts Bay in the SW.

QUAQUA AUREA **(N.E. Br.) Plowes** This species forms clumps up to 25 cm in diameter. The stems are decumbent and are up to 15 cm long. The inflorescence is produced towards the apex of the stems. Up to 10 flowers, opening virtually simultaneously, are borne on a very short pedicel. The flowers are campanulate, up to 20 mm in diameter. The lobes are sub-erect and reflexed. The colour is yellow to whitish-pink, unmarked and covered with very short bristles except on the margins and at the apex of the lobes.

Distribution: Occurs on the escarpment of the Bokkeveld Mountains W of the Knersvlakte, from Loeriesfontein southwards to the Botterkloof N of the Doring River.

QUAQUA BAYERIANA **(N.E. Br.) Plowes** This rare species forms small clumps of erect to decumbent green to purple stems, which are up to 15 cm long. The inflorescence is produced from a small patch and the very small flowers are borne on very short pedicels which bend downwards so that the flowers are nodding. They are up to 25 mm in diameter. The colour is pale cream to yellowish, sometimes unmarked and sometimes with irregular reddish patches intensifying towards the tips of the lobes.

Distribution: The distribution of this interesting species is limited but is fairly common to the hills N of Garies in the NW Cape.

QUAQUA CINCTA **(Lückhoff) Bruyns** This is a small clump-forming species with stems up to 28cm in length. Their colour is green to purplish-green. The inflorescence is produced from near the apex of the stems, with up to 3 flowers opening in succession. The flowers are produced on short pedicels and are campanulate to rotate. The background colour is pale cream to pale yellowish with red to light purple markings. The concentric rings on the inside of the tubes are characteristic, and usually with elongated markings, becoming solid towards the lobes. The lobes are ciliate with long many soft clavate cilia from the sinus to ¾ the length of the lobes.

Distribution: This is a rare species occurring in a very limited area from S of Springbok to NE of Concordia in N Namaqualand.

QUAQUA CONFUSA **Plowes** This is a small quaqua which forms a dense and compact clump with erect to decumbent stems up to 27 cm tall and which are slimmer than its close relative *Q. parviflora*. The stem-colour is grey-green to purplish. The inflorescence is produced towards the tips of the stems and are on short downward-bending pedicels with the flowers nodding. The flower, which is up to 12 mm is diameter is rotate, yellowish with dark purplish, to reddish purple irregular dots, becoming solid towards the ends of the lobes. the edges of the lobes are densely ciliate with long soft cilia for most of the lobe's length.

Distribution: Occurs in the Knersvlakte from W of Vreden-dal across to the eastern escarpment and then E to near Loeriesfontein.



Gerhard Beukes



Tim Peatling



Rob Nagel



Darrel Plowes



Darrel Plowes



Darrel Plowes



Tim Peatling

1 - 3. ***Quaqua armata*** (1) in habitat at the Holgat River, south of Alexander Bay (2 & 3) In cultivation
4. *Quaqua aurea* in habitat, Inset: in cultivation
5 & 6 *Quaqua bayeriana* in cultivation from a plant from Koringhuis, 30 km SSW of Springbok
7 - 9. ***Quaqua cincta*** (8 & 9) in cultivation. (10) From a plant 18 km SE of Springbok
10 & 11 *Quaqua confusa* (11) in cultivation From a plant from Koringhuis, 30 km SSW of Springbok on the Wildeperdehoek Pass (12) In cultivation



Darrel Plowes

Rob Nagel



John Frew



Nigel Dennis



Darrel Plowes



Quaqua dependens **(N.E. Br.) Plowes** This species also forms small dense clumps with stems up to 27 cm tall. Their colour is grey-green to purplish. The short pedicels bend downwards and the nodding flowers are up to 12 mm in diameter. The colour is yellowish with dark purple to reddish markings. One third of the outside of the lobes and their entire edges are uni-coloured with striated markings for the rest.

Distribution: Recorded from S Namaqualand from Citrusdal to Klawer and across to the Botterkloof, S of Nieuwoudtville.

Quaqua framesii **(Pillans) Bruyns** This distinctive species forms robust clumps up to ½ m wide. The stems are decumbent, with pungent deltoid teeth. Their colour is grey-green to purplish. The inflorescence is produced towards the apices of the stems with up to 10 simultaneously opening flowers. The flowers are campanulate with the lobes being linear and somewhat truncate at the ends. Their colour is yellow with the face covered with papillae from which arises a longish stiff bristle.

Distribution: This species occurs from S of Nuwerus and along the course of the Sout River north of Vanrhynsdorp, and south towards its confluence with the Olifants.

Quaqua gracilis **(Lückhoff) Plowes** This species forms a compact clump with stems up to 27 cm tall. Its colour is grey-green to purplish. The inflorescence is produced on upper parts of the stem. The flowers are borne on longish pedicels which are bent upwards holding the flowers semi-erect. The flowers are up to 19 mm in diameter with long narrow reflexed lobes appearing to be constricted towards the middle. Their colour is whitish-cream with the upper part of the lobes above the constriction uni-coloured yellow to light brownish. The constricted portion is generally unicoloured reddish to brownish with the limb covered with elongated dots. A few to many cilia are present on the lower half of the lobes.

Distribution: Occurs along the W edge of the Roggeveld Mountains which forms the E border of the Ceres Karoo from the Bloukrans Pass in the N. Also across to the Botterkloof along the Doorn River.

Quaqua hottentotorum **N.E. Br.** This is a relatively robust species which forms clumps up to 32 cm in diameter. The stems are decumbent, grey-green to purplish. The inflorescence usually comprises many flowers produced on the upper half of the stems on very short pedicels. The flowers are up to 12 mm in diameter, rotate, campanulate, ascending or spreading. The colour is usually cream but may be yellowish to green or palest pink. There are often very short erect bristles in the mouth of the tube.

Distribution: Very widespread from Aus in Namibia, southwards to N of the Knersvlakte. The distribution is along the E escarpment away from the coast.

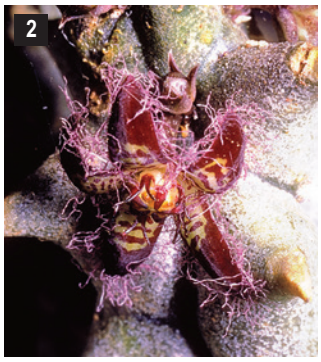
Quaqua incarnata **(L.f.) Bruyns** This is a robust species forming clusters up to 35 cm in diameter. The stems are greyish-green to dark purplish-green and up to 30 cm long. The angles of the stems are armed with sharp conical tubercles. The inflorescences are on the upper half of the stems and are quite prolific, opening at the same time. The flowers are up to 23 mm in diameter and are borne on a very short pedicel, almost sessile. They are campanulate and are rotate to strongly ascending. The colour on the inside ranges from creamy-white through yellow to more usually pink. The mouth of the tube has short bristles.

Distribution: This species occurs from near Darling just N of Cape Town to S of the Olifants River near Klawer. It occurs near the coast and inland as far E as Clanwilliam.

Quaqua inversa **(N.E. Br.) Bruyns** This is a robust small plant, forming clumps up to 30 cm in diameter. The stems are armed with sharp deltoid tubercles and are up to 30 cm long. They are uniform green to green with purplish mottling. The inflorescences are usually at near to the apex of the stems and are borne on a short pedicel. The flowers are rotate, campanulate and up to 18 mm in diameter. Their inside colour is pale cream to yellowish marked with dark purple to bright red, often unicoloured across the limb and half the lobes, but mottled in the tube; sometimes mottled across the face, but always unmarked on the outer half of the lobes. The edges of the lobes are heavily ciliate with long contorted soft clavate hairs.



Darrel Plowes



Darrel Plowes



Loukie Viljoen



Darrel Plowes



Darrel Plowes



Norbert KleinMichel



Gerhard Beukes

1 & 2. ***Quaqua dependens*** (1) in cultivation from above the Bulhoek Barrage, 7km N of Clanwilliam. (2) From near Clanwilliam
3. ***Quaqua framesii*** in cultivation from 10km W of Vredendal:
4 & 5. ***Quaqua gracilis*** in cultivation
6 & 7. ***Quaqua hottentotorum*** in cultivation
8 & 9. ***Quaqua incarnata*** (8) in cultivation (9) In habitat near Steinkopf, south eastern Richtersveld
10 & 11. ***Quaqua inversa*** in cultivation



Rob Nagel

Darrel Plowes



Tim Peatling



Tim Peatling



Distribution: Rare and widely scattered, occurring inland from NW of Springbok, near Port Nolloth, to near Vanrhynsdorp. More readily encountered from W and SW of Kamieskroon.

QUAQUA LINEARIS **(N.E. Br.) Bruyns** This is one of the smaller quaquas which is difficult in cultivation and will root only from the main stem. It branches from above the base. The stems are up to 20 cm tall, green to purplish-green without the sharp tubercles of most of the other members. The inflorescence is produced mainly on the upper parts of the stem with up to 3 campanulate flowers with long reflexed sub-erect to erect lobes, up to 20 mm in diameter. The flowers open simultaneously on short pedicels and their colour is red-purple with the limbs and tubes white.

Distribution: The species is found S of Laingsburg along the Witteberg range to the Anysberg. Also occurs on the N slopes of the Warmwaterberg in the Little Karoo, well S of the main habitat.

QUAQUA MAMMILLARIS **(L.) Bruyns** This species is probably the best-known quaqua. It is a robust species, with strongly-armed stems up to 45 cm long. the plant forms large clumps up to 65 cm in diameter. The colour is green to purple brown, sometimes almost black from the effect of a harsh sun. The inflorescence is produced on the upper 2/3 of the stem with as many as 15 flowers to a fascicle. The flowers are up to 4.5 mm in diameter campanulate and semi-erect. The inside is purplish brown to reddish on the lobes. The tube is pale cream to white with irregular transversely elongated dots. The entire face is covered with small papillae tipped with a short bristle.

Distribution: This is a very widespread species and may be encountered from the W Sperrgebiet, S of Lüderitz, across the drier parts of the western and NW Cape and westward toward Beaufort West and southwards towards Oudtshoorn.

QUAQUA MARITIMA **(Bruyns) Plowes** This is a robust species with hard and sharp deltoid tubercles. The plant forms clumps of up to 60 cm with stems up to 17.5 cm in height. Their colour is grey-green with purple mottling. The inflorescence is produced towards the apex of the stem and consists of fascicles producing up to 15 flowers which are borne on short pedicels and which open almost simultaneously. The flowers are dark maroon, somewhat rugulose with a cream to white tube which is sometimes barred or with elongated transverse spots. The mouth and inside of the tube is covered with small papillae tipped with a short ascending bristle.

Distribution: This species is confined to a narrow coastal strip from S of Alexander Bay to N of the Olifants River. It favours coastal sands.

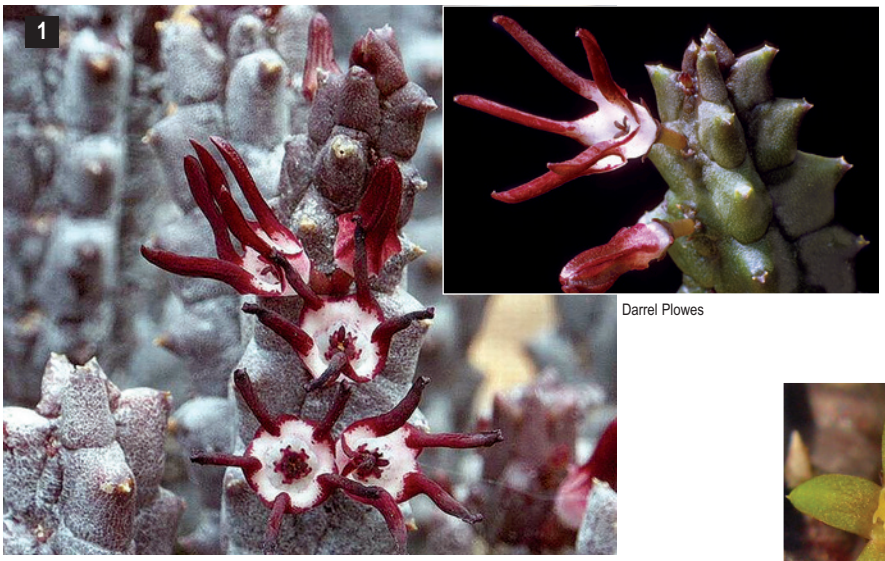
QUAQUA MULTIFLORA **(R.A. Dyer) Bruyns** This species forms broad spreading clumps up to half a metre in diameter. The decumbent stems are up to 15 cm tall. They are green to light purple. The inflorescence is borne on the upper parts of the stems but sometimes on the lower parts. There are up to 3 flowers in the fascicle and they open more or less simultaneously. The flowers, which are borne on a short pedicel, are up to 20 mm long, are sub-erect and holding the flowers sideways. The tips of the lobes turn inwards. Their colour on the outside is shiny purple and on the inside more mat purplish-red to dark red with yellowish mottling generally along the longitudinal apex of the lobes and within the tubes. The tube is shortly ciliate.

Distribution: This species is widely, but sparsely, distributed: it is found near Matjiesfontein, around Calvinia and near to Kamieskroon and towards Springbok.

QUAQUA PALLENS **Bruyns** This strange species forms decumbent clumps and is often scandent. The stems are up to 30 cm long and are green to purple. The flowers are produced on the upper parts of the stem in small numbers on a short pedicel. The small rotate flowers are up to 10 mm in diameter and are borne facing slightly upwards. Their colour is pale green with a lighter colour on the limb. The lobes are slightly reflexed. They are glabrous.

Distribution: This species is very localised to the hills N of Garies in Namaqualand, where they are frequent.

QUAQUA PARVIFLORA **(Masson) Bruyns** This species forms a group with *Q. confusa, Q. dependens, Q. gracilis* and *Q. swanepoelii*. These four species have been described as



Darrel Plowes

Kotie Retief



Jean-André Audissou



Darrel Plowes

1. ***Quaqua linearis*** in cultivation
2 & 3. ***Quaqua mammillaris*** (2) in cultivation
on the Anenous Pass, west of Steinkopf (3) In cultivation
4 & 5. ***Quaqua maritima*** in cultivation:
6. ***Quaqua multiflora*** in cultivation
7. ***Quaqua pallens*** in habitat at Studer's Pass, NW of Garies
8 & 9. ***Quaqua parviflora*** in cultivation

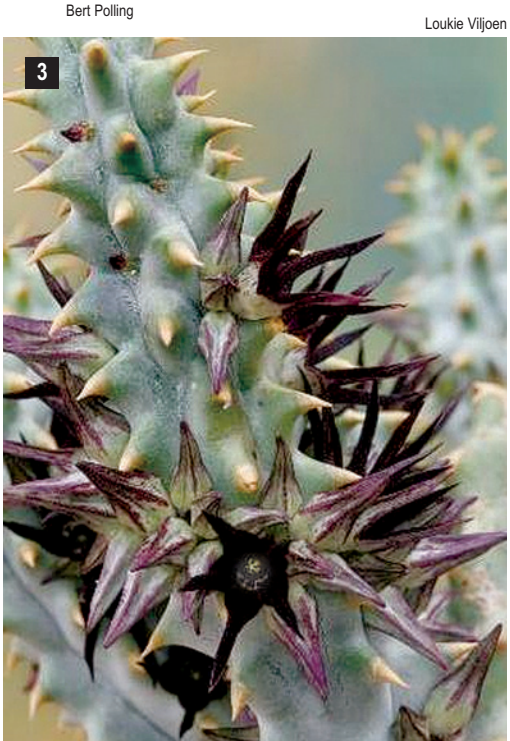


Bert Polling



Darrel Plowes

Loukie Viljoen



Tim Peatling



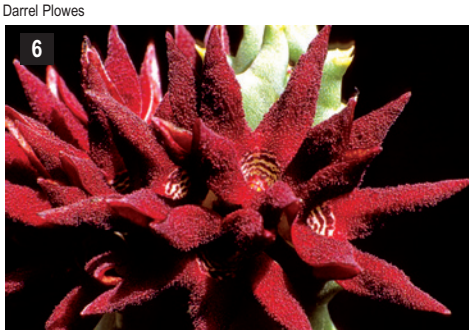
Tim Peatling



Darrel Plowes



Darrel Plowes



subspecies of *Q. parviflora* but this is not acceptable as the differences between the taxa are sufficient to warrant their own specific rank. The plant forms loose clumps up to 30 cm in diameter with stems up to 30 cm long. They are green to purple in colour. The inflorescence is formed on the upper parts of the stems. The tiny flowers are up to 18 mm in diameter, the background colour is green with purple-red transversely elongated dots, sometimes less distinct towards the ends of the lobes.

Distribution: This species is quite common from the S parts of the Richtersveld E of Port Nolloth, southwards to W of Vanrhynsdorp.

QUAQUA PILIFERA **(Bruyns) Plowes** This species is similar to *Q. arenicola* but its strikingly different flowers does not qualify its inclusion as a subspecies of that species. The stems are produced in dense tightly-packed clumps up to 15 cm tall. The small rotate to campanulate flowers are up to 25 mm in diameter. The face is very dark purple to dark red, dull in colour and densely and prominently papillate with bristle tipped papillae. The tube is smooth and pale yellow with transverse markings.

Distribution: Occurs only on the Roggeveld plateau from Middelpos across to Fraserburg.

QUAQUA PILLANSII **(N.E. Br.) Bruyns** This species is robust, growing up to over 1.5 m in diameter. the stems are decumbent to erect and up to 40 cm long, grey-green to pale purple and often mottled with brownish-purple. The inflorescence is produced in dense fascicles of many flowers on the upper parts of the stems. The flowers are campanulate, with semi-erect blunt lobes, usually turned up at the tips. Their colour is very pale pink to white with irregular markings over the entire face. the face is covered with small papillae each tipped with a longish bristle.

Distribution: Widely but sparsely distributed through the Little Karoo, the extreme S of the Great Karoo from Anysberg in the W to N of Port Elizabeth.

QUAQUA PRUINOSA **(Masson) Bruyns** This rare and somewhat controversial plant does not seem to fit into any of the existing genera and should perhaps occupy its own genus. It has however been included in *Quaqua*. The stems are narrow, long and decumbent, almost prostrate. The plant has a single main stem from which branches many from above the base. The stems are recorded up to 50 cm long, thin and somewhat attenuate. Their colour is dark green to purplish to almost black in the harsh sun of its arid habitat. The inflorescence is produced on the upper parts of the stems and the rotate flowers are up to 12 mm in diameter. The inner surface is grey and mottled with dark maroon occasionally with a whitish ring around the corona. he surface is densely covered with wrinkled long whitish cilia.

Distribution: Widely, but very sparsely, distributed on the Namaqualand plateau from Rosh Pinah in S Namibia, southwards to N of Garies.

QUAQUA PULCHRA **(Bruyns) Plowes** This rare species forms small clumps up to 30 cm across with decumbent to erect stems up to 32 cm tall. The stems are armed with pungent deltoid tubercles and the colour is green. The inflorescence is produced on the upper stems and the flowers are rotate, yellow with red markings on the limb, sometimes halfway up the lobes and around the corona. The markings are sometimes entire and sometimes striate. The lobes edges and lower parts of the lobes are covered with long contorted reddish hairs.

Distribution: Occurs in a very limited range from N of Vanrhynsdorp to near Lutzville on the Knersvlakte.

QUAQUA RAMOSA **(Masson) Bruyns** This species is unusual in the quaquas in that the stems are not armed, but are rounded. It is a robust greyish-green to green species forming a plant which roots only from the central stem. It is up to 30 cm tall with many side branches. The inflorescence is produced on the upper parts of the plant forming fascicles of up to >12 flowers in a short pedicel. The flowers are up to 15 mm long and are narrowly campanulate with strongly reflexed lobes. They are deep purple to dark red becoming paler towards the corona with purple spots. The outer edge of the tube is papillate with a short bristle on each papilla.



Dennis de Kock



Tim Peatling



Rob Nagel



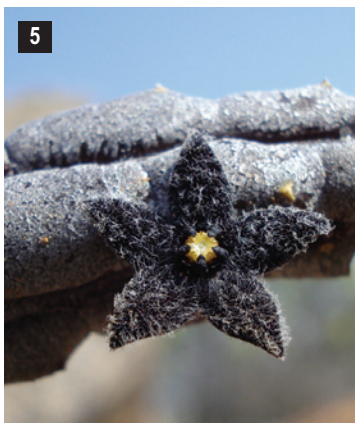
Darrel Plowes

1. ***Quaqua pilifera*** in cultivation
2. ***Quaqua pillansii*** in cultivation from near Robertson, W Cape
3 & 4. ***Quaqua pulchra*** (3) in cultivation plant
from north of Lutzville, NW Cape. (4) In cultivation

5 - 8. ***Quaqua pruinosa***
(5 & 6) in habitat south of Tatasberg, Richtersveld
(7 & 8) In cultivation
9 & 10. ***Quaqua ramosa*** (9) in cultivation. (10) In habitat



Friederika Hüber & Ulrich Trünkle



Judd Kirkel Welwitch



Darrel Plowes

Judd Kirkel Welwitch



Darrel Plowes



Judd Kirkel Welwitch



Distribution: From W and S Little Karoo to near Oudtshoorn. Along the E parts of the Agter Witteberg, also narrowly into the Great Karoo around Laingsburg.

QUAQUA SWANEPOELII **(Lavranos) Plowes** This species forms dense to diffuse clumps up to 35 cm in diameter. The fairly slender stems are up to 30 cm long and are armed with sharp deltoid tubercles. They are grey-green to purplish. The inflorescence is produced on the upper parts of the stem on a short slender pedicel. The tiny flowers are rotate to shallowly campanulate. The insides are purple to red with markings around the corona and narrowly onto the lobes. The edge of the lobes have short clavate cilia.

Distribution: This species is found across from N of Nieuwoudtville to S and N of Calvinia where it is found around the Hantam mountains.

QUAQUA TENTACULATA **(Bruyns) Plowes** This species is similar to *Q. incarnata* and *Q. hottentotorum*. The plant forms a robust clump up to 30 cm in diameter. The stems are armed with deltoid teeth and the colour is greyish-green to purplish. The inflorescence consist of up to 15 flowers to a fascicle, each borne on a very short pedicel. The campanulate flowers are up to 25 mm in diameter with characteristic slender reflexed lobes. Their colour ranges from clear pale yellow to creamy yellow suffused with pink. The base and mouth of the tube has short translucent cilia.

Distribution: Distribution is limited. It occurs across the Knersvlakte from N of Vanrhynsdorp to near the coast.

RICHTERSVELDIA Meve & Liede

This genus was previously classified under *Notechidnopsis* and before that as *Trichocaulon*. Much earlier it was classified as a *Caralluma*. Its stems are very reminiscent to those of *Notechidnopsis tessellata* and I am not particularly convinced that it was correct to excise it from that genus.

RICHTERSVELDIA COLUMNARIS **(Nel) Meve & Liede** This is a rare monotypic species which forms loose clumps of prostrate, decumbent or erect stems which can be as long as up to 60 cm, though usually shorter. The stems are somewhat tessellate although the tubercles are more acutely tipped than those of *Notechidnopsis tessellata*. They are green to purple. The inflorescence is borne on the upper two thirds of the stems on a short to long peduncle with as many as up to 20 flowers being produced in rapid succession. The flowers are rotate with the lobes slightly bent downwards. The flowers are borne on short pedicels and are up to 15 mm in diameter, are yellow, either unicoloured or with many small lateral red markings.

Distribution**:** This rare species, which is endemic to the Richtersveld in South Africa, occurs from the extreme N of the national park southwards to near Kubus. It is confined to the higher parts, such as Helshoogte. It has not been recorded from north of the Orange River.

STAPELIA L.

This genus are characterised by their 4–angled stems which are usually pubescent, slightly toothed, decumbent to somewhat straight. The very large to small flowers are produced from near the bottom of the stems, from or near the apex and also randomly along the stems.

STAPELIA ACUMINATA **Masson** This species forms rather small diffuse clumps with the stout stems reaching up to 20 cm Their colour is green, suffused with purple. The inflorescence is produced from a peduncle with up to 3 flowers borne on a short pedicel. The flowers are rotate, up to 35 mm in diameter, the lobes are acuminate and are fringed with long white simple cilia. The faces of the flowers are transversely rugose with the apices of the rugosities creamy-coloured and the valleys purple to reddish. Towards the tips of the lobes they tend to be unicoloured.

Distribution: The species occurs around Kamieskroon, northwards to the Knersvlakte, from near the coast to W of Loeriesfontein.

STAPELIA ARENOSA **Lückhoff** This is a small species which produces few green pubescent stems. The stems are up to 22 cm long and erect to decumbent. The inflorescence is usually produced on the upper half of the stems, but not always. The rotate flowers are produced in small groups on a short stout peduncle with short pedicels facing mainly upwards. The face of the flowers is transversely very rugose. Their colour is purple to deep red. The rugosities on the limb are white, giving a frosted look to the flower.



Rob Nagel



Darrel Plowes

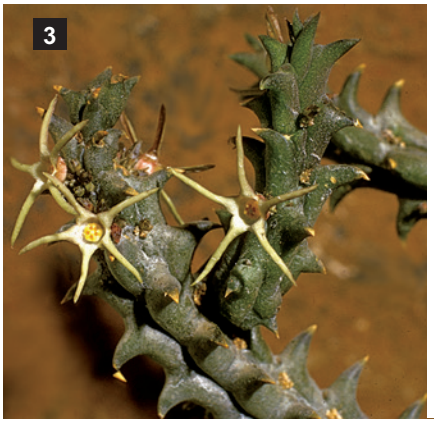


Dennis de Kock



Dennis de Kock

1 & 2. ***Quaqua swanepoelii*** in cultivation
3 & 4. ***Quaqua tentaculata*** (3) in cultivation
(4) From near Nuwerus, northern Cape
5 - 7. ***Richtersveldia columnaris***
in habitat at Helskloof, Richtersveld National Park
8 & 9. ***Stapelia acuminata*** in cultivation.
10 & 11. ***Stapelia arenosa*** in cultivation showing colour variation



John Frew



Darrel Plowes



Inge Pehlemann-Brase



Fanie de Meillon

Gerhard Beukes



Robin Frandsen



Martin Heigan



Distribution: Widely distributed from near Kamieskroon in the N, to Nieuwoudtville and Loeriesfontein southwards into the S Ceres Karoo.

STAPELIA ASTERIAS **Masson** This species, together with *S. vetula, S. baylissii, S. gariepensis, S. tsomoensis, S. praetermissa,* and *S. peglerae,* has been transferred to *S. hirsuta.* As each of the flowers are distinctive and each of the species are quite consistent in characteristics it is not acceptable that the various species should thus be subsumed and it follows the disturbing trend to willy-nilly lump somewhat similar species together without any real justification. This distinctive species forms large clumps which can be up to 1 m in diameter. The stems are erect, finely pubescent and up to 30 cm tall. The inflorescence is generally 1 per stem on a stout peduncle with up to 3 flowers being produced in gradual succession on fairly long pedicels. The flowers are 120 mm in diameter, are coloured from deep shiny purple to shiny red, heavily transversely rugose on the lobes and to a lesser extent on the disk, sometimes unicoloured sometimes with the apices of the rugosities coloured yellowish. The face is mainly glabrous. The edges of the lobes are heavily ciliate with long white to light red cilia. The ciliation may cover the disk in the region of the sinuses.

Distribution: The species is found in the Little Karoo and in the S Ceres Karoo.

STAPELIA BAYLISSII **Leach** This species forms large clumps which can be up to 1 m in diameter. The stems are grey-green, erect, glabrous and up to 30 cm tall. The inflorescence is generally one per stem and is developed on a stout peduncle with up to 3 flowers being produced in gradual succession on a fairly long pedicel. The flowers are up to 65 mm in diameter, acuminate, rotate, dull to shiny, coloured purple to dark red. The lobes are ciliate with short purple cilia on the edges. the lobes are obscurely rugose with the disk smooth to obscurely rugose, but less than on the lobes.

Distribution: Occurs on the S parts of the Zuurberg range, NE of Port Elizabeth and to NW of Grahamstown.

STAPELIA CEDRIMONTANA **Frandsen** This species is a small erect stapelia which forms dense stands up to 45 cm in diameter. The slender minutely pubescent stems are up to 20 cm tall and are green sometimes mottled with purple. The inflorescence is produced near the base of the stems from a stout peduncle, with up to 3 flowers produced in succession on long pedicels. The rotate deflexed flowers are up to 50 mm in diameter when not deflexed and are pale brown through red to purplish-red to deep purple, with raised rugosities which are coloured yellowish to pale cream.

Distribution: Occurs on the NE slopes of the Kouebokkeveldberge, on the Cedarberg as far N as the Matsikamma Mountain south of Vanrhynsdorp. It is also found on the Piketberg Massif in the Swartland.

STAPELIA CLAVICORONA **Verdoorn** This species is a small shrub with few stems. The lightly-pubescent stems are up to 20 cm tall, are stout, coloured green with purple mottling. The inflorescence is produced mainly near the base on a short peduncle. Generally up to 3 flowers are produced on a short pedicel. The flowers are up to 50 mm in diameter. They are rotate, slightly deflexed and transversely rugose and their colour is yellowish to brick-red. The characteristic corona is prominent with its dark-purple to red clavate inner lobes. The lobes are ciliate at the margins with short white hairs.

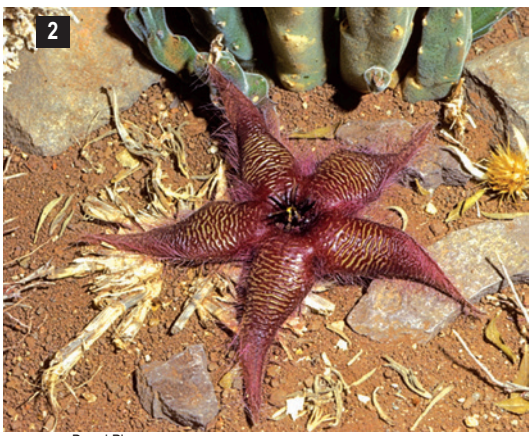
Distribution: The species is associated with the Soutpansberg mountains where it occurs on the N slopes near Wylliespoort and eastwards.

STAPELIA DIVARICATA **Masson** This is a small shrub with densely-packed stems up to 12 cm long. Stems are finely pubescent, green in colour to purplish. The inflorescence is borne on a short peduncle near to the base of the stem. The rotate flowers are up to 60 mm in diameter, are reflexed with the longish lobes often somewhat contorted. Their colour ranges from yellow to bright red. Their face is shiny and glabrous but sparsely ciliate on the edges with long simple white hairs.

Distribution: This rare species is confined to a small area E of Swellendam in the SW Cape.



Darrel Plowes

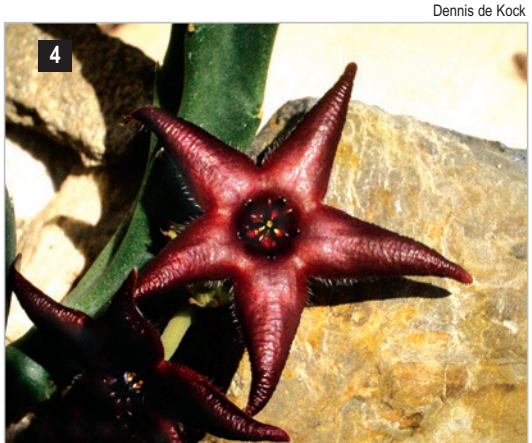


Darrel Plowes



Darrel Plowes

Dennis de Kock





Loukie Viljoen



Bert Polling

1 & 2. ***Stapelia asterias*** in cultivation from Schoemanspoort, 25km NE of Oudtshoorn
3 & 4. ***Stapelia baylissii*** in cultivation
5 - 7. ***Stapelia cedrimontana*** (5 & 6) in cultivation. (7) In cultivation. The plant is from type locality in the northern Koue Bokkeveld. The flower is typical of the original description
8 & 9. ***Stapelia clavicorona*** (8) in cultivation, clearly showing the clavate inner corona lobes. (9) From a plant from Wylliespoort, Soutpansberg
10 & 11. ***Stapelia divaricata*** in cultivation



Loukie Viljoen



Loukie Viljoen



Darrel Plowes

Darrel Plowes





Darrel Plowes

Stapelia engleriana **Schltr.** This clump-forming species has its long decumbent and ascending stems. These are green and finely pubescent. The inflorescence is randomly disposed along the stems with 1–3 flowers produced in short succession. The flowers are up to 25 mm in diameter when extended before the lobes fold tightly backwards. The corona is contained in a well-defined pentagonal depression. The lobes are finely transversely rugulose, the colour is pale yellow with the tops of the rugosities purple, to uniformly dark purple to bright red. The face is shiny and glabrous.

Distribution: Occurs from south of Vanrhynsdorp, southwards towards Citrusdal, also on the Piketberg massif.

Stapelia erectiflora **N.E. Br.** This is a small shrub forming a dense clump up to 25 cm tall. The stems are green to purplish and are finely pubescent. The inflorescence is produced on the upper half of the stems from a short peduncle. The flowers are borne upright in long pedicels, up to 120 mm in length. They are up to 14 mm in diameter before folding back, they are yellow to light purple with pale transverse yellow striations. The face is covered with short to long, thick translucent clavate cilia. The lobes are strongly revolute and the corona is prominent. I recognise one other subspecies: var. *prostratiflora.* It has been postulated that this variety is a hybrid between *S. erectiflora* and *S. glanduliflora*. This has not been conclusively proven and for this reason it is been upheld here. The only discernable difference is that the flowers are produced from near the base of the stems and are prostrate on the ground.

Distribution: This plant occurs from the top of the Bokkeveld mountains to the W of Calvinia and southwards through the mountainous areas to Citrusdal. The variety *prostratiflora* occurs in the extreme S parts of the Knersvlakte north of Klawer.

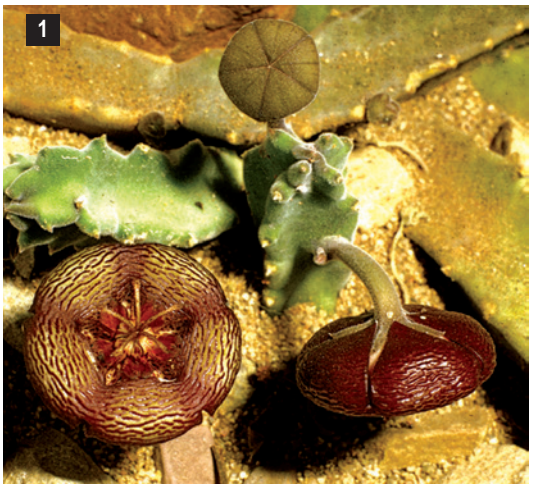
Stapelia flavopurpurea **Marl.** This multi-stemmed erect to decumbent species generally grows to about 10 cm, although I have seen it nearly twice that height. The green to purplish stems are finely pubescent somewhat rough to the feel. The inflorescence is borne on short peduncle near the apex of the stem on long pedicels with the flowers held facing upwards. The flowers are up to 50 mm in diameter with the narrow reflexed lobes prominently transversely rugose. The centre of the flower has a small annulus which has long clavate whitish cilia which cover the entire disk. The lobes are variously bright yellow to dull green to pink.

Distribution: This is a widespread species occurring from S of Windhoek, southwards inland on the higher elevations to S of Brandvlei and E to near Kimberley and Prieska.

Stapelia gariepensis **Pillans** This species has, without sufficient justification, been reduced to a subspecies of *S. hirsuta*. It is clearly a good species and I treat it as such here. This is a clump-forming species which can form large stands of 1 m in diameter. The slightly pubescent green stems are sometimes mottled with purple and are up to 30 cm tall. The inflorescence is produced near the base of the stem with a few flowers being produced in succession. The flowers are borne on short to long pedicels and are up to 90 mm in diameter. The flowers are shiny and dark, to lighter, red fading to yellow with age. The lobes are glabrous with the disk, the sinuses and the margins of the plant densely ciliate with long whitish to reddish cilia.

Distribution: Occurs on both sides of the border between South Africa and Namibia, narrowly along the region of the Orange River from about Beauvallon, E of Alexander Bay to the northern hills and valleys of the Richtersveld National Park and northward to Rosh Pinah.

Stapelia gettliffei **R. Pott** This is a many-stemmed species which forms large mats up to 2 m in diameter. The stems are up to 12 cm in length and are pubescent, green to greyish-green in colour and are characterised by the long lanceolate ascending vestigial leaves which are adpressed to the stem. The inflorescence is produced on a short peduncle from near the base of the stem. The rotate flowers are borne on longish pedicels and are up to 100 mm in diamete and lie flat on the ground. The face of the flowers is rugulose. Along the centres of the lobes they are yellowish to dark red with the edges of the lobes and the disk dark purple to red with lateral striations. The edges of the lobes and the central disk or limb are covered with a dense idumentum of long soft hairs.



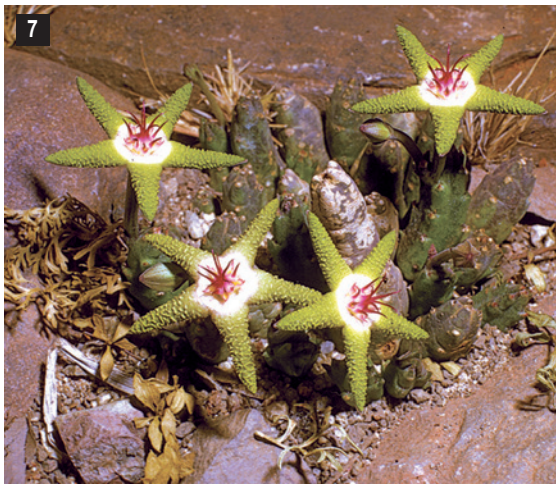
Darrel Plowes



Loukie Viljoen



Martin Heigan



(7, 8 & 9) Darrel Plowes





Inge Pehlemann-Brase

1 - 3. ***Stapelia engleriana*** in cultivation.
4 & 5. ***Stapelia erectiflora*** in cultivation
6. ***S***. ***erectiflora* var. *prostratiflora*** in cultivation. Will probably be elevated to full species rank
7-9. ***Stapelia flavopurpurea*** (8 & 9) in cultivation

10 - 12. ***Stapelia gariepensis*** (!0) in habitat at Beauvallon, NW Richtersveld (11&12) in habitat on Hellshoogte, Richtersveld National Park showing the darker newer blooms and the faded-to-yellow older blooms
13 &14. ***Stapelia gettliffei*** (13) In habitat. (14) in cultivation



Tim Peatling

Dennis de Kock



Robin Frandsen





Robin Frandsen

Darrel Plowes



(13) Darrel Plowes, (14) Tim Peatling





Distribution: This species is very widely distributed: along the SE regions of Zimbabwe, near the Save River, narrowly into the adjacent Mozambique, southwards to Beit Bridge and across much of the Limpopo Province, southwards to N of Pretoria and across to E Botswana from S of Gaborone to S of the Zambezi River.

STAPELIA GIGANTEA **N.E. Br.** As its name implies this is truly a large species, boasting its place among the largest of the known flowers. The plant forms a dense, many-stemmed mat with pubescent decumbent to erect green stems up to 35 cm tall. The inflorescence is produced on a short thick peduncle. The flower is borne on a longish pedicel and its diameter is up to about 25 cm. The face of the rotate flower is pale cream with thin lateral red striae, closer together towards the shallow tube. The face is pubescent with the hairs longer towards the edges of the lobes and in the tube. The tips of the lobes tend to contort.

Distribution: Very widespread from N and E, southern and SW Zimbabwe, E Botswana, Limpopo Province, North West Province, Mpumalanga, Swaziland, northern Zululand and southwards towards Pietermaritzburg.

STAPELIA GLANDULIFLORA **Masson** This small succulent forms compact clumps up to 50 cm in diameter. The green to purplish finely pubescent stems are up to 15 cm tall and are sub-erect. The inflorescence is produced on a thick peduncle with up to 10 flowers opening in succession. The flowers are borne on long pedicels and are produced laterally along the ground facing upwards. They are up to 2.5-3.5 cm in diameter when fully spread and are slightly deflexed. Their colour is yellow and thickly covered with long white clavate cilia.

Distribution: This species has a very limited distribution along the course of the Olifants and Doorn rivers from S of Vanrhynsdorp to near Clanwilliam.

STAPELIA GRANDIFLORA **Masson** This large species has two varieties: var. *grandiflora* and var. *conformis*. The plant forms large compact clumps of up to 1 m in diameter. The stems are up to 30 cm in height. The stems are green, sometimes mottled with purple. The inflorescence is produced from a short thick peduncle with up to 5 flowers being produced on a longish pedicel. The rotate, generally reddish to purplish flowers, with the tips of the lobes sometimes with a darker-coloured patch, are up to 250 mm in diameter. They are transversely rugose with the face covered with fine white cilia and the margins densely covered with much longer white cilia.

Distribution: This is a very widespread species, occurring from N of Kimberley across to near Clarens in the Free State Province, in a wide swathe southwards to near East London and westwards to near Loxton.

STAPELIA HIRSUTA **L.** This variable species is a favourite and is very popular in collections. It forms large clumps which can be up to 1 m in diameter. The pubescent stems are decumbent to erect and up to 30 cm long. The inflorescence is produced from a successively developing cyme on a stout peduncle from near the base of the stems. The flowers are up to 120 mm in diameter and are borne flat on the ground on longish pedicels. The insides are densely ciliate and are pale yellowish to pale cream in colour, heavily striated with purple and grading to unicolour towards the ends and edges of the lobes.

Distribution: Fairly widespread from Wellington to E of Laingsburg and southwards to the Little Karoo.

STAPELIA IMMELMANIAE **Pillans** This charming species forms compact clumps with pubescent stems up to 20 cm high (although I have personally encountered a plant in habitat with some stems which were decumbent and up to 30 cm in length). The inflorescence is produced randomly

Stapelia immelmaniae plant in cultivation
Photo Darrel Plowes





Loukie Viljoen



Darrel Plowes



Loukie Viljoen



Dennis de Kock



Robin Frandsen



Darrel Plowes



Darrel Plowes

1 & 2. ***Stapelia gigantea*** (1) in cultivation (2) In habitat in Mkhuze Game Reserve, KwaZulu-Natal
3 - 5. ***Stapelia glanduliflora*** in cultivation from near Clanwilliam
6 & 7. ***Stapelia grandiflora*** in cultivation
8 & 9. ***Stapelia hirsuta*** Two plants in cultivation

Darrel Plowes



Darrel Plowes



along the stems, frequently towards the apex, on short stout peduncles, sometimes with several peduncles flowering together on the same stem. Flowers are produced usually facing upwards on long pedicels and are up to 45 mm in diameter. Inside colour yellowish-brown or pinkish, obscurely transversely striated and concolourous on the limb and lobe tips. They are densely ciliate over the whole surface and margins with long white stiff hairs.

Distribution: Confined to the Piketberg Massif, in the Swartland of the SW Cape.

STAPELIA KOUGABERGENSIS **Leach** This very distinctive little stapelia has an erect growth form with pubescent stems up to 20 cm tall. The colour is greyish-green often with a sheen. The inflorescence is produced on a short peduncle towards the base of the stem, often many-flowered—up to 8 observed—borne on a longish pedicel. The shallowly-campanulate flowers are up to 30 mm in diameter and are dull-purple with yellowish-cream sparse transverse striations, sometimes uni-coloured purple. Usually glabrescent but sometimes slightly pubescent near the margins.

Distribution: Between Willowmore and Steytlerville in the E Cape.

STAPELIA KWEBENSIS **N.E. Br.** This is an erect to decumbent clump-forming species, not usually more than 15 cm tall. The pubescent stems are tapering to a sub-acute apex. The inflorescence is subsessile, randomly produced. The flowers are up to 30 mm in diameter and face outwards. The evil-smelling flowers are rotate with a small central cup. The colour is brownish to dark purple, uni-coloured but the cup is occasionally pale cream in colour. The surface is glabrous and heavily transversely rugose.

Distribution: This is a very widespread species, occurring in a wide swathe from near the Etosha Pan in Namibia in the W, across Botswana southwards to near Thabazimbi in South Africa and then northwards to near Mutare in E Zimbabwe and narrowly into Mozambique. There is a disjunct occurrence S of the Kunene River in the Kaokoveld in NW Namibia.

STAPELIA LEENDERTZIAE **N.E. Br.** This is an easily-distinguished species with its bulbous, purple flowers. The plant forms large stands of densely-pubescent lax to sub-erect stems up to 15 cm tall. The flowers are produced near the base of the stem on short pedicels and face sideways. The all-purple to red deeply campanulate flowers with reflexed lobes are smooth to lightly puberulous outside and transversely rugose inside slightly hairy but more dense towards the centre.

Distribution: A widespread species from Heidelberg, Gauteng in the W, to E of Ohrigstad and SE to Komatipoort in Mpumalanga and southwards into Swaziland.

STAPELIA LONGIPEDICELLATA **N.E. Br.** This is a small very variable species, closely related to *S. kwebensis* and *S. similis*, forming an erect to decumbent clump, not usually more than 15 cm tall. The pubescent stems are tapered to a sub-acute apex. The inflorescence is erect and randomly produced. The flowers are up to 25 mm in diameter, rotate with a small central cup. The colour is brownish to dark purple, with the central cup sometimes lighter-coloured. The surface is glabrous and heavily transversely rugose.

Distribution: An inhabitant of central Namibia from the Angolan border in the N to as far S as Warmbad and S of Karasburg.

STAPELIA MACOWANII **N.E. Br.** This species forms clumps with pubescent, grey-green stems up to 30 cm tall. The inflorescence is produced as a cyme on a short peduncle, with flowers borne successively on short pedicels. Flowers are up to 60 mm in diameter with the inside sparsely pubescent and the edges ciliate with long white simple stiff hairs. The face is transversely rugose, reddish to brown with the limb and half of the lobes usually yellowish to whitish coloured on the striae. The tips and lobe edges are uni-coloured. It has one variety: *conformis* which differs in its larger (up to 155 mm in diameter) flowers, darker at the apex and partially down the sides and it has longer pedicels.

Distribution: A very limited area at Steelpoort near Grahamstown, with var. *conformis* being found from Graaff-Reinet to Steytlerville and eastwards to near Grahamstown.





(1) Sylvain Bergaud, (2) Loukie Viljoen

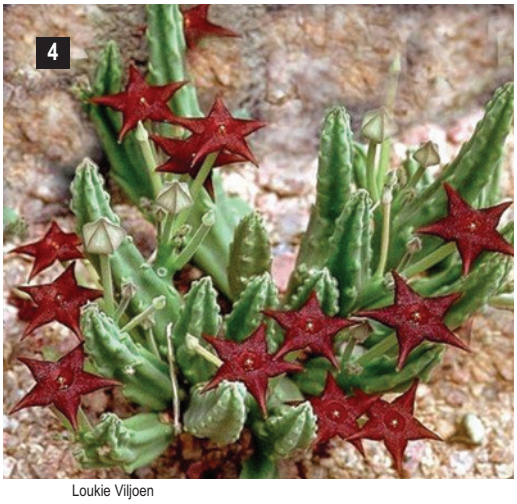




(8 & 9) Darrel Plowes



Inge Pehlemann-Brase



Loukie Viljoen





Tim Peatling



(10) Loukie Viljoen, (11) Darrel Plowes

1 & 2. ***Stapelia kougabergensis*** in cultivation
3 - 5. ***Stapelia kwebensis*** (3) in habitat in Namibia showing unusual whitish-coloured cup. (4 & 5) In cultivation
6 & 7. ***Stapelia leendertziae*** in cultivation.
8 & 9. ***Stapelia longipedicellata*** in cultivation (8) Detail of a fully opened deflexed flower showing colour variation. (9) In habitat in N Namibia
10 & 11. ***Stapelia macowanii*** in cultivation
12. ***S. macowanii* var. *conformis*** in cultivation

Darrel Plowes



Darrel Plowes



Robin Frandsen



Stapelia montana **Leach** This species is closely related to *S. cedrimontana, S. paniculata* and *S. immelmaniae.* It is a small species with stems rarely taller than 75 mm. The green stems are glabrous or minutely asperulous. The inflorescence is usually towards the base of the stem and is produced on a small peduncle. The small flowers, up to 30 mm in diameter, are transversely rugose, usually strongly reflexed. The colour is purple, sometimes with yellowish markings on the striae on the limb. The surface is pubescent with short hairs and the edges of the lobes are ciliate with long, usually purplish, hairs. The variety *grossa* differs from the nominate species in that its stems are stouter. The flowers are usually larger and with whitish hairs.

Distribution: Both of the varieties occur in the S Ceres Karoo.

Stapelia obducta **Leach** This is a dense to diffuse species forming clumps up to 45 cm in diameter, with finely pubescent stems up to 15 cm tall. The inflorescence is borne on short to longish pedicels near the base of the stem. The flowers are up to 70 mm in diameter when flattened. The lobes curl back. The colour is dark-brown to purple, somewhat lighter towards the tips of the lobes. The face is densely pubescent with long soft hairs, longest and most dense towards the edges of the lobes.

Distribution: Occurs north of Patensie in the Groot Winterhoek mountains (northern slopes of the Cockscomb Peak), NE of Willowmore and in the Longkloof near Joubertina.

Stapelia olivacea **N.E. Br.** This is a clump-forming compact plant up to 15 cm in diameter with finely pubescent stems up to 12 cm tall. The inflorescence arises from a short stout peduncle near the base of the plant on a short pedicel. The flowers are up 4 cm in diameter, shallowly campanulate with the lobes slightly deflexed. The unicoloured flowers are transversely rugulose, usually blackish but also reddish to olive-green. The margins of the otherwise glabrous flowers are usually ciliate with long white stiff hairs.

Distribution: This widespread species is recorded from S of Kuruman, S of Kimberley, W to near Calvinia, E of Graaff-Reinet. and S of Beaufort West.

Stapelia paniculata **Willd.** This species forms large spreading clumps with densely pubescent green stems, often with purple-mottling, which are up to 15 cm tall. The inflorescence is produced on a short peduncle anywhere along the stem and the plants are very floriferous. The flowers are formed on shortish pedicels with the flowers facing somewhat upwards. The flowers are up to 30 mm in diameter, shallowly campanulate, inside is mauve to purple-brown with pale yellowish transverse striations. The face is densely villous with long, straight, flat-sided hairs.

Distribution: Occurs eastwards from Lamberts Bay, through to the Piketberg massif. Between Loeriesfontein and Nieuwoudtville to Vredendal and near Clanwilliam.

Stapelia pearsonii **N.E. Br.** This is a compact clump-forming species with densely pubescent, grey-green stems marked with purple and up to 12 cm long. The flowers are produced from a short peduncle near the base of the stems, on long upward-tending pedicels with the flowers facing upwards. They are up to 50 mm in diameter, deeply lobed, rotate and glabrous with fine rugosities. They are generally uni-coloured but may be slightly darker towards the tips of the lobes. Their colour is pale yellow-brown to deep purple-brown.

Distribution: This rare species is recorded only from the Great Karas Mountains in southern Namibia.

Stapelia peglerae **N.E. Br.** Plants are erect to somewhat decumbent, with stems up to 18 cm tall. The stems are glabrous and rather pointed at the apex, greenish to grey-green sometimes with reddish mottling. The inflorescence is shortly pedunculate and usually well below the middle of the stem. The flowers are borne on longish pedicels and are up to 75 mm in diameter. The surface is almost glabrous with some short, thin sparse hairs on the limb near to the corona. The edges are heavily ciliate with long white hairs. Their colour is uniformly purple to reddish sometimes with transverse pale-yellowish striations on the limb and basal parts of the lobes.

Distribution: Confined to the NE parts of the E Cape from approximately Butterworth to well north of Mthatha.



Darrel Plowes



Darrel Plowes



Darrel Plowes



Darrel Plowes



Darrel Plowes



Martin Heigan



Dennis de Kock

1. ***Stapelia montana*** in cultivation
2. ***S. montana* var. *grossa*** in cultivation
3 - 5. ***Stapelia obducta*** (3) *In cultivation* (4) Newly opened flower (5) with fully opened with reflexed lobes
6 - 8. ***Stapelia olivacea*** in cultivation
9 & 10. ***Stapelia paniculata*** in cultivation
11 &12. ***Stapelia pearsonii*** in cultivation.
13 & 14 ***Stapelia peglerae*** in cultivation
(13) A plant from the Lower Tsitsa Falls, 50 km north of Mthatha
(14) In cultivation. Ttwo clones showing the extreme variation of plants from 'The Collywobbles', Mbashe River, west of Mthatha



Org Fritz



Darrel Plowes



Darrel Plowes

Nigel Dennis



Rob Nagel



Dennis de Kock



Loukie Viljoen



***Stapelia pillansii* N.E. Br.** This is a compact species forming clumps as large as 1 m in diameter, with erect pubescent stems up to 20 cm tall. The inflorescence is produced on a short peduncle. The flowers are borne on longish pedicels and are up to 20 cm in diameter. They are very deeply lobed and the buds are pointed with the lobes generally contorted. When open the long narrow lobes are usually twisted, They are glabrous and lightly rugulose with long stiff white hairs along the edges of the flower. The colour is reddish to dark purple. The flowers of the variety *fontinalis* are bright yellow in colour.

Distribution: Occurs along the N side of the Little Karoo, the SW Great Karoo from SW of Leeu Gamka to Laingsburg. Variety *fontinalis* occurs near Matjiesfontein.

***Stapelia praetermissa* Leach** This species forms compact erect clumps of glabrous or microscopically asperulous stems which are up to 12 cm tall. The inflorescence is randomly produced along the stems on longish pedicels with the flowers facing outwards or upwards. The rotate flowers are up to 50 mm in diameter. They are reddish to dark purple, shiny and shortly pubescent on the face with longer hairs along the edges of the lobes and with long white cilia along the edges. The variety *luteola* is distinguished by its yellow corolla.

Distribution: Occurs N and NE of Port Elizabeth, notably around Grahamstown. The variety *luteola* is encountered around the Kariega River, N of Port Elizabeth.

***Stapelia pulvinata* Masson** This spectacular species has lax, rather creeping, densely pubescent stems up to 20 cm, rarely longer in shade. The inflorescence invariably produces a single flower from low down on the stem on a longish decumbent pedicel, which bears its flower facing upwards on the ground. The flower is up to 13 cm in diameter when flattened, but soon reflexes strongly. The transversely rugose flower's colour is dark purple with the limb and half of the lobes with pale creamy yellow striations along the apices of the rugae. The edges of the lobes are densely ciliate with long purple hairs. The limb is covered by a dense and prominent idumentum of long soft crisped hairs.



Darrel Plowes

Distribution: This remarkable species occurs from just south of the Orange River in the Richtersveld, southwards, fairly narrowly along the coast into the Knersvlakte.

***Stapelia remota* R.A. Dyer** This odd, 'remote' and rare species, closely related to *S. engleriana*, forms erect and compact clumps with very minutely pubescent 4–angled, - rarely more - stems up to 15 cm tall. The inflorescence is produced on a short peduncle near the base of the stem. The flowers are borne on short pedicels and face outwards. They are up to 20 mm in diameter when flattened and become strongly revolute. The corolla face is dark maroon and slightly yellowish towards the tips. The tube is pentagonal and mottled, the glabrous, shiny limb and lobes are sparsely and irregularly pustulate. The edges of the lobes are densely ciliate with long dark purple clavate cilia, which protrude in clusters out of the sides of the lobes.

Distribution: Like *Baynesia lophophora*, it occurs in a single locality in the Baynes Mts, in the NW corner of Namibia.

***Stapelia rubiginosa* Nel** This is a rare clump-forming, erect species with purplish stems, with densely white pubescense, up to 13 cm tall. The inflorescence is randomly disposed along the stem and the flowers tend sideways on a short, almost sessile pedicel. The flowers are rotate with the limb appearing to be a slightly raised annulus. Their diameter is up to 25 mm and the lobes tend to reflex, appearing to clasp the stem. The surface is somewhat rugulose with the limb being lighter in colour than the lobes. Their colour is dark purple to reddish-brown and glabrous, but sometimes minutely puberulous. The margins are fringed with short stiff cilia.



Darrel Plowes



Darrel Plowes



Loukie Viljoen



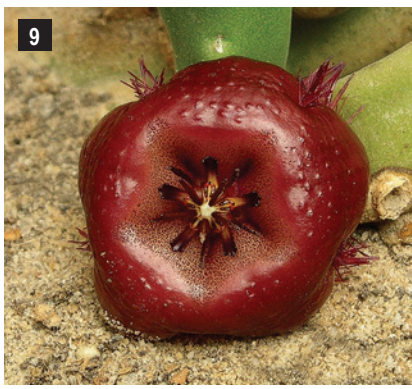
Tim Peatling

Darrel Plowes

1 & 2. ***Stapelia pillansii*** in cultivation showing colour variation
3. ***S. pillansii* var. *fontinalis*** in cultivation
4. ***Stapelia praetermissa*** in cultivation
5. ***praetermissa* var. *luteola*** in cultivation
6 & 7. ***Stapelia pulvinata*** (6) in cultivation from Arkoep about 8 kn north of Kamieskroon (7) In cultivation
8 & 9. ***Stapelia remota*** in cultivation.
10 & 11. ***Stapelia rubiginosa*** in cultivation



Loukie Viljoen



Dennis de Kock



Darrel Plowes



Martin Heigan



Dennis de Kock



Distribution: An endemic to the Richtersveld, S of the Orange River, across the National Park and southwards to Eksteenfontein and across to S of Vioolsdrif.

STAPELIA RUFA **Masson** This is a small clump-forming species up to 50 cm in diameter, with green to purplish pubescent stems up to 13 cm tall. The inflorescence is randomly produced on a short peduncle usually near the base of the stems. The shallowly-campanulate flowers are borne facing sideways on a shortish pedicel. The face is uni-coloured, brown to reddish-brown, transversely rugose and minutely pubescent on the lobes.

Distribution: This is a widespread South African endemic, which occurs from S of Upington in a broad sweep from Vanwyksvlei in the W to Britstown in the E and southwards to the Little Karoo with Montagu in the W, to E of Oudtshoorn.

STAPELIA SCHINZII **Berger & Schltr.** Forms loose clumps of up to 1 m in diameter, with stems rarely longer than 0.75 cm. The stems are glabrous, but occasionally minutely pubescent when young. They are green occasionally with purple mottling. The inflorescence is almost invariably single on a small peduncle. The flower is borne on a short pedicel and faces outwards to upwards, The diameter of the rotate flower is up to 20 cm. They are finely transversely rugulose with several longitudinal channels radiating from the limb to the lobes. Their colour is pale brownish to purplish, with pale yellow-brown specimens encountered. The lobes are heavily fringed with purple clavate vibratile cilia. Two varieties are recognised: var. *bergeriana* with smaller flowers, which has no transverse rugosities and shorter acuminate lobes. The variety *angolensis* has slender smaller-toothed uniformly, green stems, which tend to creep and cascade down slopes.





Stapelia schinzii
Left: in cultivation
Photo Loukie Viljoen
Below: In habitat
Photo Darrel Plowes

Distribution: Except for var. *angolensis* the species is a Namibian endemic, widespread from the Kaokoveld across to Ovamboland, then southwards in a broad inland sweep to the Great Karas Mountains in the SE across to near Aus in the W. The variety *bergeriana* is recorded in a small area N of Outjo in Namibia. In our area var. *angolensis* inhabits only the Baynes Mountains in the NW corner of Namibia.

STAPELIA SCITULA **Leach** This small neat erect species forms small clumps of densely, shortly pubescent stems up to 75 cm tall. The stems are bright green when young becoming purplish with age. The inflorescence is produced from the base of the stems with as many as 10 flowers being produced successively. The rotate flowers, which tend to reflex, are borne on longish pedicels and are up to 25 mm in diameter. The surface is transversely rugose, reddish to purplish, sometimes with transverse pale creamy-yellow linear markings. The surface is densely pilose with white to reddish stiff hairs.

Distribution: This rare species is known from a limited area near to the Langvlei in the Robertson area of the W Cape.

STAPELIA SIMILIS **N.E. Br.** This is a small species which forms neat clumps of up to 15 cm in diameter and rarely more than 12 cm in height. The stems taper, are pubescent and are grey-green often tinged with purple. The inflores-cence is formed near the base of the stems producing up to 6 flowers opening in gradual succession. The flowers are borne on long lax pedicels with the flowers facing upwards. The flowers are rotate and up to 25 mm in diameter and uni-



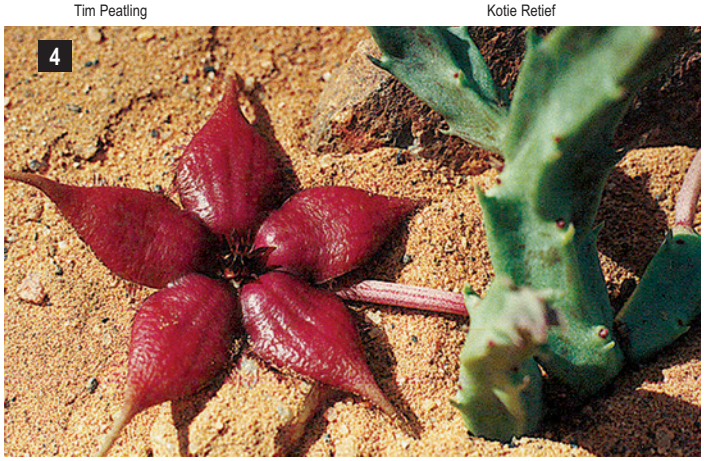
Darrel Plowes



Tim Peatling



Kotie Retief



Inge Pehlemann-Brase

Loukie Viljoen





Loukie Viljoen

1 - 3. ***Stapelia rufa*** In cultivation (1) from Kleinpoort, SE of Oudtshoorn
4. ***Stapelia schinzii* var. *bergeriana*** in habitat near Outjo, central Namibia
5. ***S. schinzii* var. *angolensis*** in cultivation
6. ***Stapelia scitula*** in cultivation
7 & 8. ***Stapelia similis*** (7) in cultivation
(8) In habitat on Kodas Peak, Richtersveld National Park





Gerhard Beukes, inset Darrel Plowes

Gerhard Beukes



coloured, ranging from greenish-brown to dark purplish-black, The surface is glabrous and strongly transversely rugose becoming somewhat lenticular in the mouth of the shallow cup.

Distribution: This species has its E limit near Upington, SE to Namies and northwards into Namibia along the E edge of the Namib. The main population is in the Richtersveld region.

STAPELIA SURRECTA **N.E. Br.** This is a small, erect plant with green pubescent stems, sometimes tinged with purple, up to 20 cm long. The inflorescence is produced mainly from near the apex of the stem. The shallowly campanulate upward-facing flowers are borne on long upwardly-facing pedicels. They are, up to 40 mm in diameter, glabrous, rugulose, coloured yellowish to pinkish to light brownish-purple.

Distribution: Occurs in the Tanqua/Ceres Karoo from S of Calvinia to Karoopoort and across to SW of Sutherland.

STAPELIA TSOMOENSIS **N.E. Br.** This species has mainly erect, almost glabrous, to very minutely pubescent stems up to about 15 cm tall. The inflorescence is produced from a successively developing cyme on a stout peduncle from near the base of the stems. The flowers are up to 75 mm in diameter, rotate with the lobes reflexing. They are yellowish-brown to reddish to purplish with transverse rugae with yellowish transverse markings in the middle of the lobes. The limb is covered with long soft whitish to purple hairs, the centre of the lobes are more or less glabrous with the edges densely covered with long soft hairs.

Distribution: Occurs from Queenstown in the S to the region around the Tsitsa River N of Mthatha in the eastern Cape.

STAPELIA UNICORNIS **Lückhoff** This species is related to *S. gigantea* but with smaller flowers, a bowl-shaped limb and a distinctive corona. It forms loose clumps up to half a metre in diameter and is of a somewhat creeping habit. The pale-green pubescent stems are up to 16 cm in length. The inflorescence is produced near the base of the stem on a short peduncle. The flowers are up to 120 mm in diameter and are shallowly to somewhat deeply campanulate. The lobes tend to be reflexed and in the more attenuated specimens the lobe-tips tend to contort. The surface is transversely rugulose and is pale yellowish-cream sometimes suffused with light red towards the tips of the lobes. The rugulosities are sometimes reddish in colour.

Distribution: Occurs generally along the Lebombo Mountains from W of Maputo in Mozambique, southwards to the region of the Jozini Dam in KwaZulu-Natal, narrowly into the W sides of the Lebombos in Swaziland and in places along the Pongola River to as far W as near Paulpietersburg.

STAPELIA VETULA **Masson** This species has been transferred to *S. hirsuta* but, that this most distinctive plant, with its small glabrous flowers is believed to be conspecific with that plant with their big 'hirsute' flowers, can only be acceptable to the cladesticians. It is rejected here. Plants form clumps with almost glabrous green to purplish stems up to 20 cm tall. The inflorescence is produced on a very short stout peduncle near the base of the stems. The flowers are borne on shortish pedicels and face sideways to slightly upwards. They are up to 70 mm in diameter, invariably rugulose, glabrous and eciliate, the colour ranges from light reddish to purple, usually uni-coloured but sometimes with the apices of the raised rugosities on the lobes bright to very dull yellow.

Distribution: Fairly common along the slopes and foothills of the W regions of the Cape sandstone mountains to as far east as Uniondale, along the Langeberge to Montagu and to N of Worcester and W of Touws River.

STAPELIA VILLETIAE **Lückhoff** Forms diffuse to erect clumps up to about 35 cm across, usually in the shade of bushes. The pubescent stems green and sometimes purplish are up to 16 cm long. The inflorescence is produced on a short peduncle, sometimes few and sometimes one only. The flowers are borne on longish pedicels tending upwards with the flowers facing upwards. The flowers are shallowly campanulate and are up to 65 mm in diameter. The surface is glabrous and rugulose, sometimes micro-hispid on the apices and margins. The margins are densely ciliate with long purplish hairs. The colour is dull purple marked along the rugae with creamy-yellow striae.



Loukie Viljoen



Loukie Viljoen

1 & 2. ***Stapelia surrecta*** in cultivation.
3 - 5. ***Stapelia tsomoensis*** in cultivation
6 & 7. ***Stapelia unicornis*** (6) in cultivation
(7) From near Makathini Swaziland
8 & 9, ***Stapelia vetula*** in cultivation
10 & 11. ***Stapelia villetiae*** in cultivation



Dennis de Kock

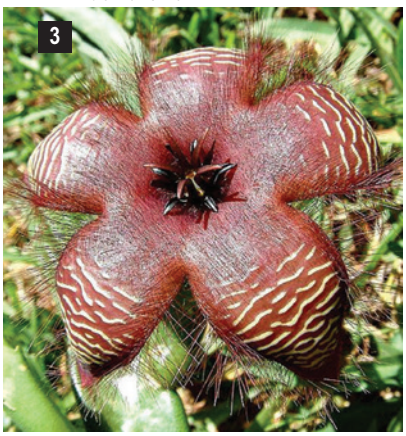


Darrel Plowes

Loukie Viljoen



Andrew van Ginkel



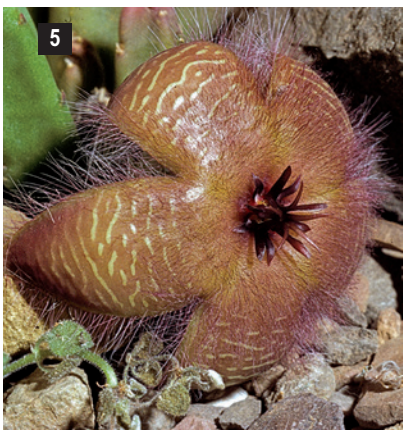
Dennis de Kock



Tim Peatling



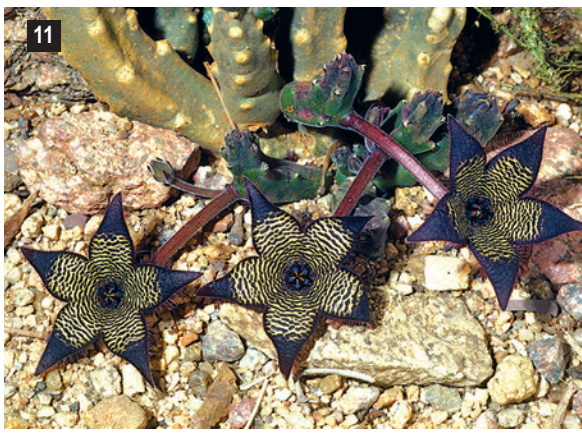
Darrel Plowes



Bert Polling



Darrel Plowes



Distribution: Of somewhat limited distribution from NE of Nieuwoudtville in a swathe across to the Hantam Mountains N of Calvinia.

STAPELIOPSIS Pillans

This is a very small genus which was established to accommodate *S. neronis*. Attempts have been made to incorporate other taxa from other genera in this genus, but I feel, as do other competent botanists, that the uniqueness of the species hereunder discussed, warrants their exclusivity.

STAPELIOPSIS KHAMIESBERGENSIS **Bruyns** This is a small plant which produced rhizomes. The green stems which are sometimes mottled with purple, are similar to those of *S. urniflora.* They are decumbent and sometimes spread underground for up to 10 cm. The flower is produced from a stout peduncle at or below ground level on a very short pedicel. The flower is urceolate, with the outside dull purple and very finely papillate. The inside is purple in the tube and creamy-yellow in the mouth, The upper half is papillate and next to the corona it is hispid. The length of the flower is up to 12 mm.

Distribution: Occurs from Springbok in the N to the Kamiesberg hills in the S, near to Kamieskroon.

STAPELIOPSIS NERONIS **Pillans** This species is not rhizomatous. It is a rare clump forming species up to 30 cm in diameter. Stems are emerald green to bluish-green usually mottled with darker blue-green. The stems are glabrous, short and squat. The inflorescence is produced on a short pedicel near the base of the stem and holds the flower upright. The flower is urceolate, up to 25 mm long. The outside is finely pubescent, deep purple to reddish, usually with longitudinal veins. The inside is creamy-white in the mouth and deep purple lower down. Approximately the lower half is pubescent with long, downward pointing hairs.

Distribution: This unusual species occurs from N and E of Rosh Pinah, southwards to W of the Fish-Orange confluence in Namibia, into the Richtersveld National Park and as far S as the Oograbies Hills, W of Port Nolloth.

STAPELIOPSIS URNIFLORA **Lavranos** This is a rhizatomous species but less so than *S. khamiesbergensis*. It is a charming little species with its bloated, squat stems and interesting little urn-like flowers. Stems are short, up to 7 cm tall, excluding the thin rhizomatous stems which are considerably longer, which form separate plants from where they emerge from underground. Their colour is silvery greyish-green to green with a bluish to dark-greenish mottling. Flowers are produced usually at soil level or beneath on a short peduncle. Flowers face upwards on a short pedicel. They are urceolate and up to 18mm long, smooth and glabrous. Their colour is shiny reddish-purple. Inside they are mat reddish-purple, smooth at the entrance, papillate for half and with short stiff hairs in the lower half.

Distribution: This is a rare and little-known species recorded from the Tiras Mountains, to Aus in Namibia and southwards into the Richtersveld in South Africa where it has been recorded in the eastern parts.

TAVARESIA Welw.

TAVARESIA BARKLEYI **(Thistleton-Dyer) N.E. Br.** This is a spiny succulent with a distinctive stem-type as will be seen from the accompanying pictures. The plant is clump-forming with erect to sub-erect stems. The stems are covered with serried ranks of paired thorns. The inflorescence is produced near the base of young stems. The flowers are produced on short pedicels and tend to be humifuse, facing sideways. They are deeply campanulate with short flaring lobes and are up to 15 cm in length. The outside is glabrous, creamy-yellow and longitudinally flecked with maroon. The inside is yellowish to cream and densely papillate. The papillae are tipped with a short bristle.

Distribution: Very widespread from N Namibia in a broad inland swathe, along the higher ground to the Great Karas Mountains; sporadically in central and N Botswana; narrowly in S Zimbabwe, across the Limpopo Province in South Africa, then from Kuruman to S of De Aar and W of Upington to W of Colesberg. I once encountered a plant growing near De Bos in the Tanqua Karoo.

TAVARESIA THOMPSONIORUM **van Jaarsveld & Nagel ex Jonkers** This unusual species was recently discovered in south western Angola. Although not yet recorded in the region covered in this book there is a strong possibility that it may well be found in the Baynes Mountains in north western Namibia. The stems appear to be somewhat similar



Dennis de Kock



Darrel Plowes



Dennis de Kock



Tim Saunderson



Darrel Plowes



Darrel Plowes

1. ***Stapeliopsis khamiesbergensis*** in cultivation
2 - 4. ***Stapeliopsis neronis*** in cultivation
(2) In cultivation
(3 & 4) From Karrachab Poort, 10 km E of Lekkersing
5 & 6. ***Stapeliopsis urniflora*** in cultivation
(5) From the Tiras Mountains, 46 km SW of Helmeringhausen, S Namibia
(6) In cultivation
7 - 9. ***Tavaresia barkleyi*** (7) in cultivation
(8) Iin habitat, 5 km S of Gaborone, Botswana
(9) Iin habitat, 16 km E of Keimoes, Bushmanland
10. ***Tavaresia thompsoniorum*** from the Abamalinda Mountains, south western Angola in cultivation



Tim Peatling

Loukie Viljoen



Darrel Plowes



Darrel Plowes



to the *T. barklyi* group but the teeth are more obconical and more pungent. Stems are green. The flowers are not tubercular, but rather flatter. Their colour is dark purple. The outer corona lobes are peculiar. They are flattened and somewhat twisted with a globular tip.

Distribution: Occur in the Abamalinda Mountains between Iona and Oncocua in SW Angola, possibly also in NW Namibia.

TRIDENTEA Haw.

Some members of this genus have been incorporated in *Tromotriche* through a cladistic approach (Bruyns 1995). But this incorporation is not accepted here as the dissimilarities, according to other taxonomists, do not allow for such a transfer. The species are remarkably homogenous in their vegetative characteristics, especially in young stems and must, therefore, be regarded as tridentias.

TRIDENTEA APERTA **(Masson) Leach** This is a tuft-forming erect to spreading species with slightly asperulous stems up to 10 cm tall. The inflorescence is produced on a short stubby peduncle usually near the base of the stems. The flowers are borne on longish pedicels which hold the flowers facing upwards. The campanulate flowers are up to about 4 cm in diameter. The inside surface is glabrous, irregularly rugulose. The colour is yellowish-brown to dark red. The inside of the tube is ± unicoloured, the apices of the rugae on the limb is white to creamy and the lobes unicoloured, or slightly lighter on the rugae.

Distribution: This species occurs in the arid regions of the SW Namibia and SW Cape. It is found in the regions around the Obib and Aurus mountains in the Sperrgebiet. Then there seems to be a gap southwards of the N Richtersveld, and then re-occurring from about Eksteenfontein and S to near Garies. It is a coastal species not found E of Springbok.

TRIDENTEA DWEQUENSIS **(C.A. Lückhoff) L.C. Leach** This small attractive species forms clumps of up to 15 cm in diameter with glabrous stems up to 12 cm long. The inflorescence is produced on a short erect peduncle. The flowers are borne on longish pedicels which hold the flowers upwards or slightly nodding. The deeply campanulate flowers are up to 3.5 cm in diameter with the surface covered with bristle-tipped papillae. The colour is creamy-yellow with large red to purplish dots.

Distribution: Originally reported to have come from the region of the Dwequa River in the Ceres Karoo. This seems erroneous as numerous searches have failed to find the plant in that region. It is well-known very much further north from north of Williston, across to Fraserburg and northwards to Brandvlei. I have encountered the plant about 25km east of Loeriesfontein.

TRIDENTEA GEMMIFLORA **(Masson) Haw.** This is a thin-stemmed plant, with proportionally large flowers, which forms dense mats which may be as large as 75 cm in diameter. The stems are glabrous and pale green with light mottling. The inflorescence is produced on a short peduncle usually low down on the stems. The flowers are borne on short pedicels which hold the flowers facing horizontal or upwards. The flowers are up to 10 cm in diameter, are yellowish-brown to purple-black, irregularly mottled with yellow, rugulose and papillate, especially towards the centre of the flower.

Distribution: This species has a very wide distribution, but is not particularly common. Its N point is about 100 km NE of Kimberley, to E of Bloemfontein, southwards through Aliwal North and in a swathe tending SW to Fraserburg and Williston. Also in a broad band from Worcester in the W to near Port Elizabeth.

TRIDENTEA JUCUNDA **(N.E. Br.) Leach** This attractive very variable species forms small clumps. The stems are glabrous, pale green with faint purple mottling and up to 12 cm in length. The inflorescence is produced on a short peduncle near the base of the stems. The flowers are borne on longish pedicels with the flowers facing ± upwards. The flowers are shallowly campanulate and up to 35 mm in diameter and ciliate on the edges. The inside colour is pale cream with purple-brown to reddish-brown large to small slightly raised spots, sometimes becoming larger and coalescent towards the edges. Two varieties are recognised: var. *cincta*, which varies in that it is eciliate; coronal differences are marked and the flowers are held more erect. The variety *dinteri* also has marked corona differences.



Darrel Plowes



Darrel Plowes



Rob Nagel



Loukie Viljoen

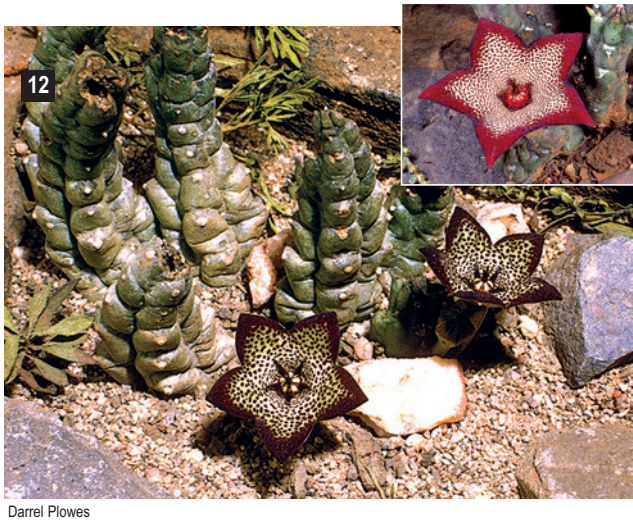
1 - 3. *Tridentea aperta* In cultivation (1) from 10 km S of Lekkersing. (2) from 21 km N of Lekkersing. (3) In cultivation
4 - 6. *Tridentea dwequensis* (4) In cultivation. (5 & 6) Plant in habitat south of Brandvlei
7 - 9. *Tridentea gemmiflora* (7&9) in cultivation. (8) In cultivation from near Steytlerville
10. *Tridentea jucunda* var. *jucunda* (10) In cultivation from near Koffiefontein, Free State Province
11. *T. jucunda* var. *dinteri* in cultivation.
12. *T. jucunda* var. *cincta* in cultivation from 16 km E of Williston



Nico Myburgh



Nico Myburgh



Darrel Plowes



Darrel Plowes



Inge Pehlemann-Brase

Dawie Human



Darrel Plowes



Loukie Viljoen



Distribution: Fairly widely distributed from Douglas in the N to Victoria West and across to near Vanrhynsdorp. The variety *cincta* occurs from near Calvinia, to Beaufort West, to Fraserburg and Sutherland. The variety *dinteri* is a S Namibian endemic from Aus in the W to Karasburg and Warmbad.

Tridentea marientalensis **(Nel) Leach** This species has one of the showiest flowers in the group. The erect to sub-erect stems, which are up to 15 cm tall, are glabrous and taper slightly towards the apex. The inflorescence is produced on a longish peduncle near the base of the stems and the flowers are borne on long pedicels and are ± humifuse. The flowers are large, up to 75 mm in diameter and are heavily rugulose, dark purple to dark red but lighter towards the centre with creamy-yellow markings, speckled with purple. The surface is papillate with long, usually white, bristles in the short tube becoming shorter on the limb. The margins are ciliate with long white stiff hairs. One subspecies is recognised: subsp. *albipilosa*. The spectacular flowers differ from the nominate in the paler corolla, the dense covering of white hairs and generally by its more campanulate shape.

Distribution: This is a mainly a Namibian species except where it strays slightly S of the Orange River near the Augrabies Falls and into the Kalahari Gemsbok Park. In Botswana it is found near Tsabong. In Namibia it is widespread from SE of Windhoek to the SW border with South Africa. The subspecies *albipilosa* occurs W of Maltahöhe and southwards to Helmeringhausen, in the Great Karas Mountains and southwards towards Warmbad.

Tridentea pachyrrhiza **(Dinter) Leach** This is essentially a desert plant. It forms tightly packed clumps up to 20 cm in diameter and the grey-green stems are up to 7 cm long. The few-flowered inflorescence is produced on a longish peduncle near the base of the stems. The flowers are produced on shortish pedicels with the rotate flowers are ± humifuse and are up to 70 mm in diameter. The surface is rugulose and papillate in the tube. The lobes are ciliate with long sub-clavate vibratile hairs. They are deltate with the edges somewhat crenate and up-turned. The colour is maroon to purplish-black and sometimes irregularly mottled with pale yellow to creamy-white.

Distribution: This is a rare coastal inhabitant from around the Bogenfels on the S Namibian coast to the Holgat River S of Alexander Bay in South Africa, where it occurs not much further E than Beauvallon on the Orange River.

Tridentea parvipuncta **(N.E. Br.) Leach** This variable species has one variety: var. *truncata*. It forms small clumps with stems up to 10 cm long. The inflorescence is produced near the base of the stems on a short spreading peduncle. The flowers are borne on long pedicels and the flowers are often humifuse. The campanulate to rotate flowers are up to 35 mm in diameter. The colour is pale cream-coloured to greenish dotted all over with purple-brown slightly raised dots which are more rounded near the outside and linear towards the centre. The lobes are usually ciliate with long clavate vibratile hairs. The var. *truncata* varies only in the shape of the corona, a feature which is not very consistent. It is also devoid of marginal cilia.

Distribution: The plants of this species occurs in the Great Karoo from S of Beaufort West southwards towards the Swartberg mountains and westwards to W of Laingsburg. The variety *truncata* inhabits the Ceres Karoo and the Doorn River valley S of Loeriesfontein.

Tridentea peculiaris **(Lückhoff) Leach** This 'peculiar' stapeliad forms clumps up to about 0.5 m in diameter. The stems are glabrous, grey-green flecked with purple and are up to 15 cm tall. The inflorescence is produced on a short peduncle near the base of the stems with few to many flowers which are produced in rapid succession. The inflorescence is produced on a short to longish pedicel, ascending and holding the flowers facing upwards. The flowers are up to 35 mm in diameter, rotate with the lobes tending to deflex, with a small annulus in the centre. The face is greenish-yellow to yellow, rugulose with the rugae reddish to brown and tipped with minute bristles. The annulus is lighter-coloured than the rest of the face. The margins are ciliate with long, clavate, vibratile cilia.

Distribution: W to SW of Vanrhynsdorp along the Olifants River, north eastwards into the Knersvlakte and NE to north of Loeriesfontein.



Darrel Plowes



Darrel Plowes



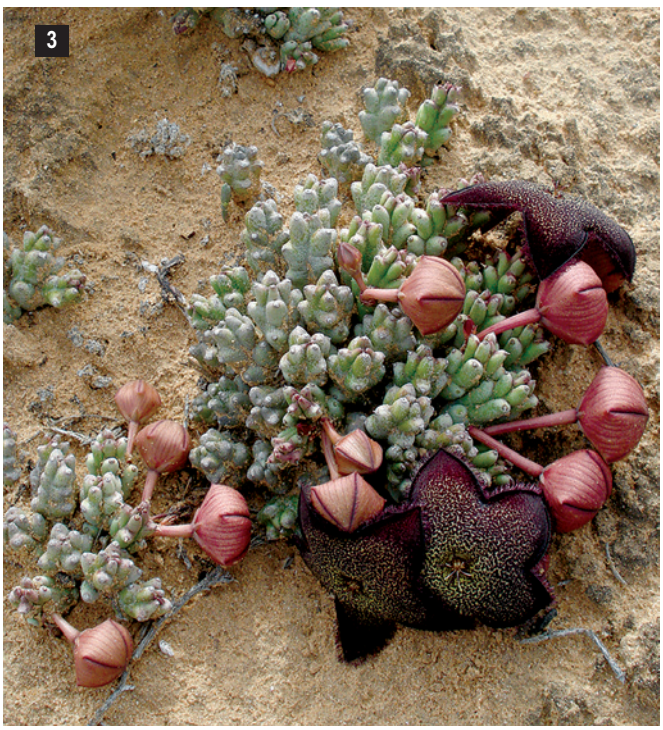
John Frew



Darrel Plowes

1. ***Tridentea marientalensis*** in cultivation from near the Augrabies Falls
2. ***T. marientalensis*** **subsp. *albipilosa*** in cultivation from 45 km N of Grünau, S Namibia
3 & 4. ***Tridentea pachyrrhiza*** (3) in habitat at Holgat, N of Port Nolloth. (4) in cultivation
5 & 6. ***Tridentea parvipuncta*** **var. *parvipuncta*** in cultivation. (5) in cultivation. (6) From Koup, 48 km W of Laingsburg
7. ***T. parvipuncta*** **var. *truncata*** in cultivation
8. *parvipuncta* var. *truncata* (*pusilla*)
9 & 10. ***Tridentea peculiaris*** in cultivation. Note the annulus: (9) from the Soutrivier, Central Knersvlakte. (10) In cultivation

Darrel Plowes



Judd Kirkel Welwitch





Darrel Plowes

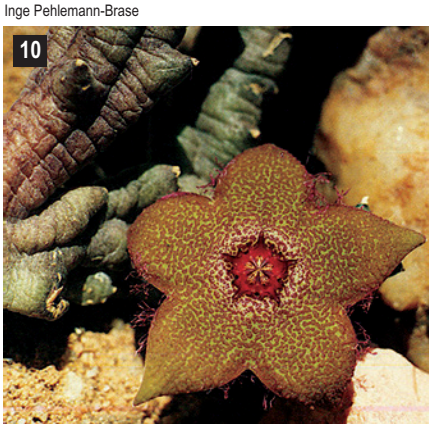
Darrel Plowes



Rob Nagel



Inge Pehlemann-Brase



TRIDENTEA PEDUNCULATA **(Masson) Leach** This is a laxly-branched and rebranched species which forms compact clumps up to 0.3 m in diameter. The glabrous green to purple stems are up to 15 cm tall. The inflorescence is shortly pedunculate and develops at random along the stem. The flowers are borne on short to long pedicels which hold the flowers facing upwards. Flowers are rotate, deeply lobed and somewhat revolute, glabrous and rugulose. They are up to 50 mm in diameter; their colour is very variable, from white to yellow to dark purple. The tube and limb are pitted and a lighter colour than the lobes, with spots. The lower edges of the lobes, but not at the sinus', have dense patches of dark-coloured, long clavate to filiforme vibratile cilia.

Distribution:: This attractive species is widely distributed along the coastal plain from S of Port Nolloth, further inland from near Steinkopf to Springbok, from N of Nieuwoudtville to Sutherland.

TRIDENTEA VIRESCENS **(N.E. Br.) L.C. Leach** Sometimes forms large clumps of erect to sub-erect greyish-green glabrous stems with purple mottling, which are up to 15 cm tall. The inflorescence produces many flowers from near the base on long erect pedicels which hold the flowers facing upwards. The brightly-coloured stellate flowers are small, up to 30 mm in diameter. The inside is bright yellow and is densely rugose-papillate in the limb and lobes and the lobes are strongly revolute.

Distribution: Widespread over the Great Karoo and narrowly into S Namibia where it is recorded from near Warmbad. From there it extends in an area bounded roughly from across to Prieska, southwards to W of Hanover and across to Aberdeen and northwards to Vanderkloof Dam on the Orange River.

TROMOTRICHE Haw.

Please refer to the introduction to *Tridentea* on P. 202. The species *Tromotriche baylissii, T. choanantha* and *T. longii* have been placed in *Tromotriche* as, with present available information, they fit here more comfortably than in *Tridentea*. However, having said this, the three species still require in-depth investigation and may yet prove to belong to a genus of their own.

TROMOTRICHE BAYLISSII **(Leach) Leach** Forms loose, spreading mats and is pendulous on rocky slopes, where stems can reach up to 3 m in length. The stems are prostrate or ascending but soon arching downwards and are sometimes rhizomatous. The inflorescence is produced near the apex of the stem with the flowers developing successively. The flowers are borne on a short pedicel, with the flowers generally facing horizontally to the stem. The flowers are pentagonally campanulate The outside is glabrous to somewhat scabrid, purplish and slightly mottled becoming darker towards the tips. The inside is glabrous, transversely rugulose except in the lower half of the tube, brown to purplish-red. One variety is recognised: var. *ciliata*. This rare plant varies being more rugose inside and with the presence of a few clavate vibratile cilia in the sinuses and significant differences between their coronas.

Distribution: Occurs commonly in the deep kloofs around the Baviaanskloof region and also found towards Patensie and towards Steytlerville in the E Cape.

TROMOTRICHE CHOANANTHA **(Lavranos & Hall) Leach** Plants are usually pendant from rock ledges on cliff faces or in shallow soil on steep rock face; then becoming partly subterranean. The glabrous stems are exceptionally long, up to 2 m, and are sparingly branched anywhere along their length. The inflorescence arises from near the base of the stems and bears up to 5 flowers which develop in quick succession. Flowers are borne on short pedicels and face sideways or slightly nodding. They are deeply campanulate and up to 16mm long. On the outside they are pinkish at the base, shading to purplish at the tips. Inside is dark maroon.

Distribution: Confined to the mountainous regions around the town of Calitzdorp in the Little Karoo, where it occurs commonly in the Huisrivier Pass and along the Huis River.

TROMOTRICHE HERREI **(Nel) Bruyns** This attractive plant forms compact to diffuse clumps up to about 30 cm in diameter. The stems are glabrous, pale greyish-green, up to about 15 cm tall. The inflorescence is most frequently produced near the apex of the stem but may appear anywhere along the stem. The flower is borne on a long usually erect pedicel and faces upwards. The flower is campanulate with a deep cup and spreading lobes. It is



Gerhard Beukes



Darrel Plowes



Darrel Plowes



Tim Peatling

1 & 2. ***Tridentea pedunculata*** (1) in habitat at Theuns-se-Dam near Kamieskroon. (2) In cultivation
3 & 4. ***Tridentea virescens*** in cultivation
5. ***Tromotriche baylissii*** In cultivation
6. ***T. baylissii* var. *ciliata*** in cultivation
7 & 8. ***Tromotriche choanantha*** in cultivation (7) 40 km S of Calitzdorp
9 - 11. ***Tromotriche herrei*** (9 & 10) in habitat at the Ouranoep River, 23 km S of Vioolsdrift. (11) In habitat on Helshoogte, Richtersveld National Park



Darrel Plowes



Loukie Viljoen

Inge Pehlemann-Brase



Darrel Plowes

Darrel Plowes



Gerhard Beukes



Darrel Plowes



Darrel Plowes



entirely glabrous and eciliate, heavily rugose, coloured from pale whitish-yellow, through deep yellow to red. The channels between the rugae is lighter in colour than the rugae and the tube lighter still, pale colour to white.

Distribution: Confined mainly to the Richtersveld mountainous areas, E of Eksteenfontein, the Helshoogte in the National Park and across to Vioolsdrif.

TROMOTRICHE LONGII **(C.A. Lückhoff) L.C. Leach** This distinctive species had somehow found its way into *Orbea* as *O. longii*, where it clearly does not belong. It is here retained in *Tromotriche* where it more properly belongs. The growth form is that of loose decumbent stems which are usually pendant on rock faces where the thin trailing stems may reach 30 cm in length. The inflorescence is usually produced near the apices of the stems and the laterally rugulose flowers are borne on short pedicels facing ± upwards. The glabrous flowers are rotate and flattish usually with an annulus. Their colour varies from brownish-yellow to brick-red, the rugae, especially evident on the annulus, are pale yellow.

Distribution: Of very limited distribution in the Klein Winterhoek Mountains and the W end of the Zuurberg N of Port Elizabeth in the E Cape.

TROMOTRICHE LONGIPES **(C.A. Lückhoff) Leach** This exceptionally attractive species forms erect to diffuse clumps up to 30 cm in diameter. The stems are glabrous, greyish-green. The inflorescence is produced mainly from near the base of the stem with the pedicels usually horizontally disposed so that the rotate flowers are usually humifuse—although erect pedicels with the flowers facing upwards are not unknown. The flowers are campanulate with spreading lobes, up to 70 mm in diameter. The surface is glabrous and densely rugulose. The lobes are uniformly purplish-red with a un-coloured margin; the limb is white, finely flecked with purple. The sinuses at the base of the lobes is densely clustered with long clavate vibratile cilia.

Distribution: From S of Aus, in Namibia, southwards the mountainous parts of the Richtersveld, Helskloof, near Cornell's Kop, southwards to Eksteenfontein.

TROMOTRICHE REVOLUTA **(Masson) Haw.** This is a rhizomatous species, ramifying underground so that the plant can extend to up to 3 m in diameter. The stems are grey-green and above ground are shortish, up to about 20 cm tall. The inflorescence is formed towards the apex of the stem. The flowers are up to about 30 mm in diameter and are borne on short pedicels with the flowers held horizontally against the stem. The flower is glabrous, smooth, rarely with striate longitudinal stripes between the limb and the lobes. The colour is reddish to brownish-red with the limb lighter-coloured than the strongly revolute lobes sometimes pale cream, with a prominent annulus. The margins are ciliate with longish clavate vibratile hairs.

Distribution: Occurs widely on the Knersvlakte in the S Namaqualand and southwards towards Clanwilliam along the Olifants River; also NW to NE of Loeriesfontein and southwards to the vicinity of Nieuwoudtville.

TROMOTRICHE RUSCHIANA **(Dinter) Leach** This very rare species looks very much like *T. longipes*. The vegetative parts are indistinguishable and the flower, which can be up to about 50 mm in diameter, looks very similar. The differences, however, are important. *T. ruschiana* varies in its completely different corona which has very distinctive club-shaped outer corona lobes. The tube containing the corona is quite cup-shaped and the corolla lobes have narrower recurved lobes.

Distribution: This species is confined to the Klinghardt Mountains in the Sperrgebiet of S Namibia, some 100 km SE of Lüderitz.

TROMOTRICHE THUDICHUMII **(Pillans) L.C. Leach** This is a clump-forming species. The plant is sometimes few-stemmed but can form large clumps up the half a metre in diameter. The inflorescence is randomly produced along the stem and the flower is borne on a very short pedicel, holding the flower adpressed to the stem. The flowers are up to 25 mm in diameter with a prominent annulus. The corona sits in a distinct pentagonal hispid tube. The annulus and strongly recurved lobes are glabrous, smooth and shiny, purplish-red, sometimes greenish-tingeing. The lobe-margins are fringed with long clavate to filiforme vibratile cilia.



Darrel Plowes



Martin Heigan



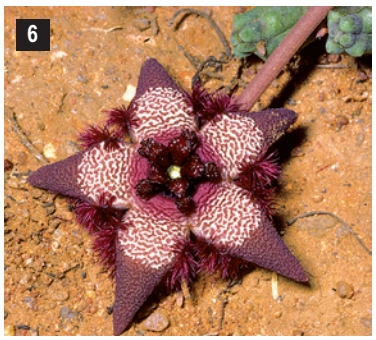
Loukie Viljoen



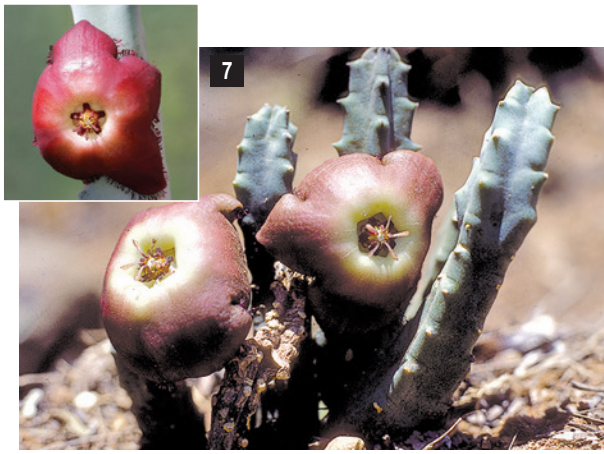
Chris Moore



Tim Peatling



Darrel Plowes



Darrel Plowes, inset Loukie Viljoen



Darrel Plowes

1 - 3. ***Tromotriche longii*** in cultivation:
4 - 6. ***Tromotriche longipes***
(4) in habitat in the Richtersveld.
(5 & 6) In cultivation
7 & 8. ***Tromotriche revoluta*** (7)
in cultivation. (8) An unusual striped form
labelled 'var. *tigrida*'
9 & 10. ***Tromotriche ruschiana***
in cultivation from the Klinghardt Mountains,
100 km SE of Lüderitz
11 - 13. ***Tromotriche thudichumii***
in cultivation



Darrel Plowes

Darrel Plowes



Darrel Plowes





Darrel Plowes

Loukie Viljoen



Distribution: Occurs over much of the Ceres Karoo and on the high Roggeveld plateau, E of the Ceres Karoo from Calvinia to S of Middelpos.

TROMOTRICHE UMDAUSENSIS **(Nel) Leach** This distinctive species from the arid north west is a compact plant which forms small clumps, with stems up to 30 cm tall. The inflorescence is produced randomly along the stem. The flowers are borne on long sub-erect weak pedicels with the flowers facing sideways to slightly nodding. The campanulate flowers are up to 25 mm in diameter, spreading with somewhat recurved lobes. The tube is rugulose, becoming more so on the lobes, is spotted on the base, with radially white or yellowish linear stripes towards the limb and occasionally for the whole length of the lobes and then uniformly yellow, brownish-yellow to pink to reddish.

Distribution: This species occurs fairly commonly in the Richtersveld National Park, across to Vioolsdrif, through Steinkopf to S of Springbok, also near Warmbad in S Namibia.

VADULIA Plowes

Originally include in the genus *Caralluma,* this genus, which name is an anagram of *Duvalia*, was transferred to *Pectinaria*. As the floral and vegetative structures vary greatly from those of that genus, it was decided that it should best be transferred to its own genus to provide for the two species discussed below.

VADULIA LONGIPES **(N.E. Br.) Plowes** The plant forms prostrate clumps with the greenish to greenish-brown stems upturning at the apices, which are up to 10 cm long. The inflorescence is produced randomly along the stems on a generally very long erect to sub-erect pedicel, up to 30 mm long, holding the flower ± horizontally. The flowers are up to 15 mm in diameter, glabrous, deeply lobed, yellow. One subspecies is recognised: The small-flowered subsp. *villetii* differs from the nominate in the upward-facing flowers and the rosy-pink to yellow flowers.

Distribution: Occurs on the Roggeveld plateau and across to south of Calvinia towards and around Sutherland, where it is most prevalent. The subsp. *villetii* is only known from around Loeriesfontein.

VADULIA MAUGHANII **(R.A. Dyer) Plowes** Forms loose mats of decumbent sometimes prostrate greenish to greenish-brown stems up to 8 cm long. The inflorescence is produced on randomly along the stems but generally towards the apices. The pedicels are shorter than the previous species, up to 20 mm long, ascending to erect and holding the flowers ± erect. The flowers are small, up to 20 mm in diameter, rotate and smooth. The colour is yellowish on the lobes grading to pink or brownish on the limb and into the tube. It is sometimes unicoloured or mottled.

Distribution: Confined to the Roggeveld plateau from about Loeriesfontein, to Calvinia to Nieuwoudtville.

OTHER ASCLEPIAD GENERA

BRACHYSTELMA R. Br.

Although *Brachystelma* occurs from South Africa to Burma and beyond, by far the most species are from southern Africa. The plants usually arise from a single tuber, but sometimes with side tubers. There are many species recorded in our area and the selection presented here covers a broad spectrum of types and is not comprehensive. The name *Brachystelma* is from the Greek, meaning short crown or girdle and could refer to the corona or to the girdle-like base of the corolla as in *B. tuberosum.* Recent studies have shown *Brachystelma* to be congeneric with *Ceropegia*. It is likely that publication of these findings will follow. This work will however maintain the *status quo* and retain the two genera.

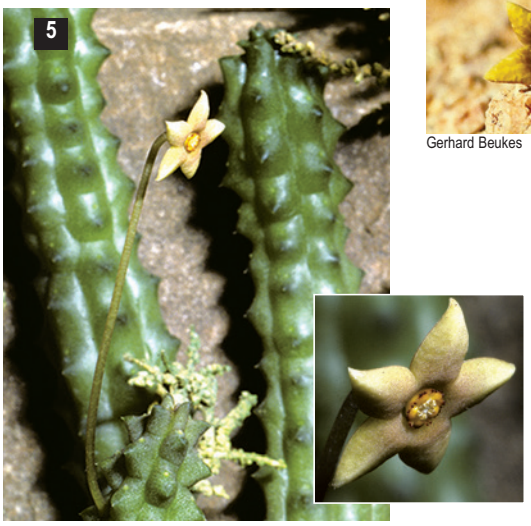
BRACHYSTELMA BARBERAE **Harv. ex Hook.** This small plant, which is produced annually, has a large usually deeply-buried edible tuber, depressed in the centre, up to 20 cm in diameter. The stems are sparsely branched from just above ground with long narrow lanceolate leaves. The flowers are usually in 2 sessile umbels of about 25 flowers produced together. The flowers are purple to crimson inside with long narrow recurved lobes, usually united at the tips. The tube is laterally striped on a yellowish background.

Distribution: This iconic species is widespread, but disparately distributed. It occurs near Tsomo in the E Cape, near Kaapmuiden in Mpumalanga, fairly common in Gauteng and northwards into S Zimbabwe.


Tim Peatling


Gerhard Beukes


Darrel Plowes


Darrel Plowes


Tim Peatling


Darrel Plowes

1 - 4. ***Tromotriche umdausensis*** (1) in habitat north of Steinkopf.
(2) From 35 km NW of Kamieskroon (3 & 4) In cultivation
5. ***Vadulia longipes*** A plant from Thyshoogte, SW of Sutherland
6 & 7. ***V. longipes* subsp. *villetii*** (6) in cultivation
(7) A pinkish-flowered specimen

8 - 10. ***Vadulia maughanii*** (8) In habitat north of Calvinia.
(9) In habitat near Calvinia,
(10) Flower from a plant 24 km north of Nieuwoudtville
11 & 12. ***Brachystelma barberae***
(11) Close-up of the flowers (12) The plant in cultivation


Rob Nagel


Dennis de Kock


Judd Kirkel Welwitch

Judd Kirkel Welwitch


Darrel Plowes


Darrel Plowes



***Brachystelma campanulatum* N.E. Br.** This dwarf perennial plant is formed from a small, shallowly buried tuber, up to 7 cm in diameter. The stems are usually solitary and unbranched. Leaves are lanceolate, narrow, up to 3 cm long. The pubescent flowers are solitary and nodding, campanulate, up to 25 mm in diameter. The tube has longitudinal broken purple markings, becoming somewhat oval and then longitudinal on a pale yellow to creamy background.

Distribution: Of limited distribution, recorded only from around Bathurst in the E Cape.

***Brachystelma chlorozonum* E.A. Bruce** This dwarf single-stemmed, sparingly-branched species, is produced annually, from a small subterranean, somewhat depressed tuber up to about 7 cm in diameter. The leaves are oblong, about 45 mm long. The flowers are produced on a short downward-tending pedicel, holding the flowers nodding. They are campanulate, about 15 mm in diameter, deeply bowl-shaped with short, somewhat recurved lobes, with concentric green to purple rings in the cup. The lobes vary from pale green to reddish-purple. The surface is heavily papillate with short white to purple hairs.

Distribution: E Mpumalanga into Mozambique and southwards into NE KwaZulu-Natal.

***Brachystelma circinatum* E. Mey.** This annually-produced species arises from a subterranean flattish, shallowly cup-shaped tuber. It is sparingly-stemmed, usually only one which is many-branched and is up to 30 cm tall. The leaves are small and oblong. The 1—few flowers are produced at the leaf-nodes. The small flowers are very variable in size, deeply divided nearly to the base, with the tips connivent. The inside colour is white, through yellow-is ish to maroon.

Distribution: Very widespread, occurs sparingly in north-central Namibia, near Gaborone in Botswana, central Limpopo Province, Gauteng, North West Province, S Free State and E Cape.

***Brachystelma coddii* R.A. Dyer** This perennial species is produced from a flattened, slightly depressed tuber which is up to about 50 mm in diameter. The 1 to few stems are deciduous and produced annually, they are up to about 30 cm long, prostrate or pendent. The leaves are rounded and somewhat heart-shaped at the base. The flowers are about 20 mm in diameter with broad lobes which narrow to a revolute tip, creamy, with large purple dots, becoming uni-coloured purple towards the tips.

Distribution: This is a fairly widespread species occurring from NE Swaziland, along the Drakensberg range of Mpumalanga and across as far as Polokwane (Pietersburg) in the W and Carolina in the S.

***Brachystelma dinteri* Schltr** This perennial species, is produced form a flattened, somewhat depressed subterranean tuber up to 6 cm, exceptionally up to 12 cm in diameter. It develops a sparingly-branched single hairy stem up to 40 cm tall. The leaves are elliptic to lanceolate-elliptic and are up to 5 cm long. The flowers, 9—12, are borne on very short pedicels at the leaf-nodes. They are rotate, with short broad lobes which are laterally rugose, glabrous with shortly-ciliate margins. The colour is bright to dark green with darker concentric blotches.

Distribution: On the N spurs of the Auas Mountain and near Grootfontein in northern central Namibia.

***Brachystelma foetidum* Schltr** This perennial species is produced from a large deeply or shallowly depressed coarse tuber up to 20 cm in diameter. It produces 1—several annual short stems with spare lateral stems with fascicular hairy leaves and short pedicillate glabrous

Brachystelma foetidum in cultivation *Photo Loukie Viljoen*





Loukie Viljoen



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Loukie Viljoen

Judd Kirkel Welwitch



Martin Heigan



Niels Jacobsen

1. ***Brachystelma campanulata*** in cultivation
2 & 3. ***Brachystelma chlorozonum*** in cultivation.
4 - 5. ***Brachystelma circinatum*** in habitat in Sekukuniland, Mpumalanga
6 - 9. ***Brachystelma coddii*** (6) in cultivation.
(7) In habitat in southern Sekukuniland, Mpumalanga.
(8 & 9) In habitat in the eastern Drakensberg, Mpumalanga
10. ***Brachystelma dinteri*** in cultivation

Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch

Niels Jacobsen





flowers, but hairy on the outside. The flowers are campanulate with broad lobes narrowing abruptly and recurving about halfway along the lobes. Their diameter is up to about 50 mm but very variable in size. The base of the lobes and the tube are coarsely rugose and the recurved lobes smooth. Their colour is deep purple, almost black in the tube and base of the lobes, lighter on the upper lobes with concentric spots and lateral lines.

Distribution: This very smelly species is widespread in the grasslands of mainly the S parts of the North West Province, Gauteng and Mpumalanga, sparsely in the central Limpopo Province, SE Botswana, the Free State Province, Zululand and E KwaZulu-Natal and Lesotho.

BRACHYSTELMA GERRARDII **Harv.** This species does not have a tuber but arises from a cluster of fleshy roots. It is sparingly branched up to 4.5 cm tall with short petioled hairy ovate leaves. Flowers with long pedicels are solitary and lateral, arise from the upper leaf nodes. Flowers are rotate and are constricted in the middle in bud and divided almost to the base. The inner surface is minutely papillate, green to dark green to purplish-black. Greyish-green to pale yellow in the tube. The margins are ciliate with long clavate vibratile hairs.

Distribution: Distribution is scattered from the KwaZulu-Natal midlands to Swaziland and northwards through Mpumalanga to E Limpopo Province.

BRACHYSTELMA GRACILE **E.A. Bruce** This is a small perennial species which has a small sub-globose tuber which is not completely subterranean. The annually-produced simple hairy stem branches occasionally from the base. The virtually sessile hairy leaves are long, up to 12 cm long and very slender. The flowers, 1—4 produced from the leaf nodes, are small, up to 10 mm long. The lobes are deeply divided almost to the base and connivent at the tips. They are pink inside and covered with long soft white hairs.

Distribution: This rare plant is recorded from near Plumtree in south western Zimbabwe, south eastern Botswana, southern Botswana and northern Zululand, near the Ndumo Game Reserve.

BRACHYSTELMA MEYERIANUM **Schltr** This dwarf species has a flattened, somewhat depressed, perennial tuber up to 6 cm in diameter. It produces 2–few annual stems which branch from the base, are sub-erect or spreading up to 15 cm long. The stems and the narrow lanceolate leaves are minutely hairy. Leaves are up to 3 cm long. Up to 4 flowers are produced laterally from the leaf nodes. Flowers are quite deeply campanulate, pale yellow to brownish to pinkish in colour and hairy within the cup and with long soft white hairs on the lobe margins.

Distribution: This charming little species is recorded from the mountainous parts of the E Cape from Komgha to Kingwilliamstown to near Stutterheim.

BRACHYSTELMA MODESTUM **R.A. Dyer** This dwarf species has a sub-globose perennial tuber which is up to 3 cm in diameter. It produced 1–2 annual erect to sub-erect stems, rarely more, up to 3 cm long. Leaves are narrow, shortly petiolate, ovate and glabrous, but sometimes with short hairs. The flowers are campanulate with short lobes; they are creamy yellow with lateral purple irregular striae in the cups, with the lobes unicoloured.

Distribution: Recorded irregularly only from KwaZulu-Natal from Nkandhla in the north, to Kranskop, to west of Durban and southwards near Umzinto.

BRACHYSTELMA PYGMAEUM **R.A. Dyer** This is a dwarf species wich occurs mainly in grasslands, where it is a Spring flowering plant, responding especially to grass fires. It has a large, flattened and centrally depressed tuber which is generally produced below-ground, unless it is exposed by being wedged between rocks. The stem-clusters are generally simple but sometimes sparingly branched. The flowers, which develop anywhere along the branches, are small, yellow, sometimes reddish on the disk. The lobes are connivent. The subspecies *flavidum* differs in its corolla lobes which are not connivent.

Distribution: Both subspecies occur from the grasslands of Mpumalanga southwards in KwaZulu-Natal into the former Transkei. *The subspecies* flavidum is not recorded in the Transkei.



Judd Kirkel Welwitch



Judd Kirkel Welwitch

1 & 2. ***Brachystelma gerrardii***
This unusual species in habitat near Wakkerstroom in Mpumalanga
3 & 4. ***Brachystelma gracile***
in cultivation
5 & 6. ***Brachystelma meyerianum***
in cultivation:
7. ***Brachystelma modestum***
in cultivation
8 & 9. ***Brachystelma pygmaeum***
Inset: from Amsterdam in Mpumalanga
(8) In cultivation from near Amsterdam, N KwaZulu-Natal
(9) A plant from central KwaZulu-Natal



Martin Heigan



John Frew



Chris Moore



Judd Kirkel Welwitch



David Styles

Tim Saunderson, inset David Styles



Chris Moore





Brachystelma remotum **R.A. Dyer** This small rare species is produced from a perennial, and somewhat depressed tuber which is up to 40 mm in diameter and which is sometimes partially exposed. It produces 1– few annual short spreading stems which are up to 60 mm long. The leaves are ovate and variably hairy. 1–2 bell-shaped flowers, which open successively, are produced from the leaf nodes and are up to 18 mm in diameter. They are campanulate, mauve to deep-purple in colour, blotched on the limb and with long white cilia on the inner surface.

Distribution: Recorded from remote mountainous areas in a triangle comprising Utrecht, Wakkerstroom and Paul-pietersburg in N KwaZulu-Natal.

Brachystelma tuberosum **R. Br.** This small species is produced from a perennial, subterranean tuber, up to 50 mm in diameter. 1–few annual erect hairy stems, up to 10 cm are produced annually. The leaves are long up to 35 mm, hairy and lanceolate. 2–4 flowers are produced from the leaf nodes, are deeply campanulate and constricted at the top of the limb; up to 20 mm in length and diameter. They are speckled purple-brown and whitish to yellowish inside and outside with transverse markings inside the tube. The lobes are unicoloured with the inside surface covered with long white cilia.

Distribution: Recorded from the E Cape near Port Elizabeth, near East London and then near Knysna.

Brachystelma vahrmeijeri **R.A. Dyer** This rare tufted species has a slightly compressed tuber up to 5 cm in diameter. It produces several erect to sub-erect annual stems, to 10 cm tall. The leaves are short petioled, narrowly lanceolate and up to 3 cm long. Two–3 campanulate flowers, with a constricted tube, are produce laterally from the leaf nodes. They range from bright yellow to reddish-purple.

Distribution: Recorded from the coastal belt of northern KwaZulu-Natal.

Ceropegia L.

This very distinctive genus is widely represented from northern Australia, Indonesia, The Far East, westwards to the Canary Islands and the whole of Africa. It is a perennial with tubers, or fleshy and rarely fibrous roots; stems are usually deciduous and sometimes twining, sometimes pendant and sometimes erect to prostrate and dependent, hanging down over rocks and ledges. The flowers are characteristic as can be seen from the illustrations. There are very many species represented in our region. Here represented are some of the very different species to show the large variation in the group.

Ceropegia africana **R.Br.** This is a vigorous climbing species, produced on tuber up to 50 mm in diameter and sometimes producing several tubers. The annual stems are sparsely branched from near the base. The leaves are fleshy, short-stalked and lanceolate The flowers are borne 2–several from the leaf nodes. They are up to 30 mm long, straight or slightly curved with a basal globose inflation, greenish-striped with violet-brown striped lobes. The lobe margins are replicate and connivent.

Distribution: Occurs sparingly in the extreme southern Cape from west of Port Elizabeth to Swellendam. It is also recorded as occurring on the Cape Peninsula.

Ceropegia ampliata **E. Mey.** This is a popular species in collections. It is non-tuberous with a cluster of fleshy roots with long twining and rambling perennial stems. The leaves are rudimentary and on the terminal growth. The profuse flowers are large and showy, up to 70 cm long, pale whitish-green with slightly darker green longitudinal veins. The connivent lobes are darker green.

Distribution: This is a widespread species occurring from near Oudtshoorn in the south westerly to as far N as near Polokwane (Pietersburg) in the Limpopo Province.

Ceropegia arenaria **R.A. Dyer** This perennial species has sub-succulent to fibrous roots with prostrate and rambling stems which root at the nodes. Leaves are obsolete, ovate up to 4 cm long. The flowers are up to 60 mm long, 2–several produced at the nodes, with a small basal inflation, becoming narrower and then abruptly flaring with long lobes constricting in the middle, replicate and connivent. The outside of the tube is pale creamy-white, with longitudinal pale serried dots. The outside of the lobes is dark purple, with the inside palest creamy-green and densely pilose. The lobes are ciliate with long hairs.



Carl Frederick



Carl Frederick



Martin Heigan



Dennis de Kock

1. ***Brachystelma remotum*** in cultivation
2 & 3. ***Brachystelma tuberosum*** in cultivation
4. ***Brachystelma vahrmeijeri*** in cultivation
5. ***Ceropegia africana*** in cultivation
6. ***Ceropegia arenaria*** In cultivation
7 & 8. ***Ceropegia ampliata*** Showing the twining stems and many flowers of this popular species



Dennis de Kock.
Inset Judd Kirkel Welwitch





Dennis de Kock



François Hoes,
inset Chris Moore



Distribution: Confined to a small area N of Sodwana Bay in N KwaZulu-Natal where it is found in sandy soil.

CEROPEGIA BARKLEYI **Hook. f.** This species is closely related, if not conspecific, with *C. africana*. The major difference is the slender lobes, which are as long, or nearly as long as the flower tube, whereas in *C. africana,* the lobes are wider and shorter than the tube. The plant has a tuber about 50 mm in diameter which sometimes produces auxiliary tubers along the roots. The 1—2 stems are slender, twining and up to about 60 cm long. Flowers are 1—3 opening in succession.

Distribution: Widely distributed from around Stutterheim in the E Cape through KwaZulu-Natal, northwards to near Barberton in Mpumalanga.

CEROPEGIA CANCELLATA **Reichb.** This perennial forms a large sub-globose or oblong tuber, producing annually a single, or occasionally 2 slender climbing, twining stems exceeding 30 cm in length. The leaves are glabrous, broad and fleshy. The flowers are 1 to few, produced successively. The 3 part corolla is up to 35 mm long with a globose base, slightly curved in the middle, expanded with connivent lobes. The colour is pale green with greenish red lobes.

Distribution: Seems to be confined to the Peddie district of the E Cape, where it has also been confirmed as occurring around the Chalumna River.

CEROPEGIA CARNOSA **E. Mey.** This perennial species has a rounded rootstock with fleshy roots, which sometimes expand into sections of fleshy tuberous storage units. The usually single stem climbs and twines to about 2 m dividing sparsely. Leaves are lanceolate and somewhat fleshy. The flowers are produced on short pedicels which curve slightly upwards, where the 3-sectioned corolla produces a lateral bulbous base, with a middle tube which curves upwards to face the remaining section, which flares with the conniving lobes facing upwards. Colour is pale cream, with reddish markings with the inside sometimes yellowish or cream with reddish flecking.

Distribution: Widely distributed from Uitenhage in the E Cape through the former Transkei, KwaZulu-Natal through to Swaziland.

CEROPEGIA CIMICIODORA **Oberm.** This perennial species has fibrous roots. The simple stem divides sparingly and scrambles or climbs twining up to several metres. Leaves are rudimentary and heart-shaped. The 3 sectioned flowers are green to creamy, sometimes unmarked, or with purplish blotching inside and outside. They have a slightly bulbous base, a narrow middle section which curves to position the funnel- and star-shaped apical section some-what upwards. The inside has long laterally-facing purplish hairs with shorter hairs on the margins. The flowers have a distinct unpleasant stench, not unlike the odour of bedbugs.

Distribution: This rare species is occurs in a smallish range N of the Soutpansberg in Limpopo Province.

CEROPEGIA CONRATHII **Schult.** This dwarf perennial has a large flattened tuber growing up to about 100 mm in diameter. 1 to many thin branching short stems are produced annually in a tuft. The leaves are lanceolate, often with crisped margins. The flowers are sometimes produced before the leaves. Many flowers develop and these have a bulbous base, a straight centre section with very narrow long connivent lobes. Their colour is yellowish, with a pale reddish tinge to the base and lower part of the tube with deep reddish flecks.

Distribution: This widespread species has its main concentration in Gauteng Province, extending to near Potchefstroom in the Northern Province and to the Botswana border near Lephalale (Ellisras).

CEROPEGIA CRASSIFOLIA **Schult.** This perennial produces a cluster of fleshy roots. It produces a single deciduous stem which in nature is unbranched or only sparingly branched. In cultivation it may produce a cluster of branches with many blooms. The leaves are ovate, fleshy and may be crisped on the margins. The flowers are produced in clusters with the bulbous base somewhat laterally disposed with the narrow and short central tube curved upwards and the lobes more or less erect. The lobes are flat becoming deeply folded towards the connivent tips. The colour is pale green with purplish heavy markings.

Distribution: Widely distribution, from the N parts of Namibia, across to the N and W parts of Limpopo Province,



Dennis de Kock



Dennis de Kock



Dennis de Kock



Dennis de Kock

1. ***Ceropegia barkleyi*** in cultivation
2. ***Ceropegia cancellata*** in cultivation
3. ***Ceropegia carnosa*** in cultivation
4 & 5. ***Ceropegia cimiciodora*** in cultivation
6. ***Ceropegia conrathii*** in cultivation
7. ***Ceropegia crassifolia*** in cultivation



Martin Heigan

Michel Monnier



Dennis de Kock



southwards through the Mpumalanga lowveld into Swaziland and southwards through KwaZulu-Natal into the E Cape as far S as Uitenhage.

Ceropegia haygarthii **Schult.** This species was previously included as a subspecies of *C. distincta*, but this inclusion is not recognised here and the species *haygarthii* is upheld. This variable species does not have a tuber and is produced on a cluster of fibrous to fleshy roots. Flowers 1—2 in a short peduncle with a slightly globose base expanding to a dilated apex with a 5—lobed pilose knob. Outside pale yellow with red spots.

Distribution: Its range extends from Mpumalanga, southwards through KwaZulu-Natal to the E Cape.

Ceropegia linearis **E. Mey.** It is appropriate to mention both subspecies here as the subsp. *woodii*, formerly *C. woodii* is very popular and common in collections, where its small tubers are frequently used to graft stapeliads which are difficult to root. The subspecies *linearis* has a fairly large tuber and the branches occasionally produce adventitious tubers along their length. The stems are annual or perennial, are several metres long, scrambling or twining. The fleshy leaves are broadly lanceolate. 2—3 flowers are produced in succession, with a small basal inflation. The long slender central tube is topped by an oval-shaped head of narrow connivent lobes. The base is creamy with the tube reddish and the apical section lobes are pilose, dark purple and pale greenish inside. The subspecies *woodii* has a flattened tuber up to about 25 mm in diameter. The thin stems are perennial or sometimes deciduous in the wild are trailing, dependent or loosely twining. The leaves are heart-shaped, fleshy and mottled pale whitish-green mottled with darker-green on the upper side and uniformly green underneath. The flowers are 1 to few, developing successively with a plain pink base and tube with dark purple connivent and hairy lobes.

Distribution: The subspecies *linearis* occurs in a limited area in coastal S KwaZulu-Natal from about Port Shepstone to narrowly into the former Transkei. The subspecies *woodii* has a very wide distribution from mountainous areas of N Limpopo Province, through Mpumalanga into the KwaZulu-Natal midlands and southwards, though sporadically, into the E Cape.

Ceropegia multiflora **Baker** The plant has a tuber up to 1.2 cm in diameter which is somewhat apically depressed and sometimes concave. The annually produced twining slender stems are up to 3 m long. Leaves are slender and about 70 mm long near the base and broader and shorter towards the tips. Flowers are a few to many arising together from a node. The plant is very floriferous. The flower has a bulbous base with a longish tube which curves upwards to hold the flower sub-erect to erect. The colour is pale greenish pink on the base pinkish on the tubes and lobes.

Distribution: The species is found from Colesberg in the S northwards to beyond Kimberley and in the S Free State Province.

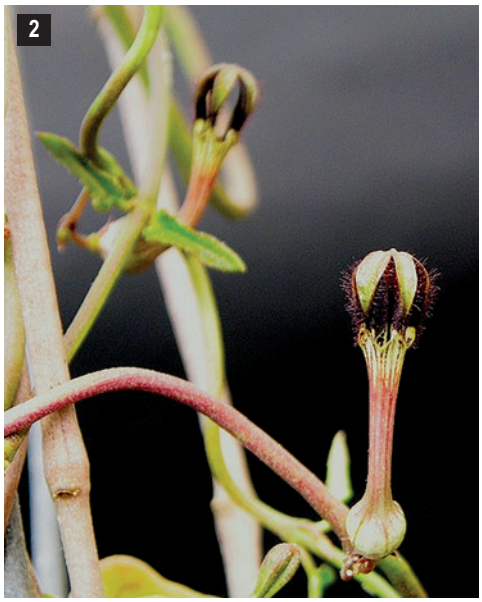
Ceropegia nilotica **Kotschy** This species does not have a tuber but has a cluster of fleshy roots. It produces a single deciduous fleshy stem up to 1 m or even much more which branches feely. The leaves are broadly lanceolate with the edges somewhat wavy. The flowers have a small basal swelling, a long central tube. The lobes are flared and then abruptly canaliculate and connivent. The basal, tube and outer lobes colour is pale cream to pale yellow, heavily marked with purple-red splotches which are sometimes confluent to form irregular banding. The inside of the corolla is splotched pale cream to uniform dark purple and is intensely hairy.

Distribution: In occurs across the N regions of Namibia and Botswana and also in E Limpopo Province, Mpumalanga, Swaziland and northern and central KwaZulu-Natal.

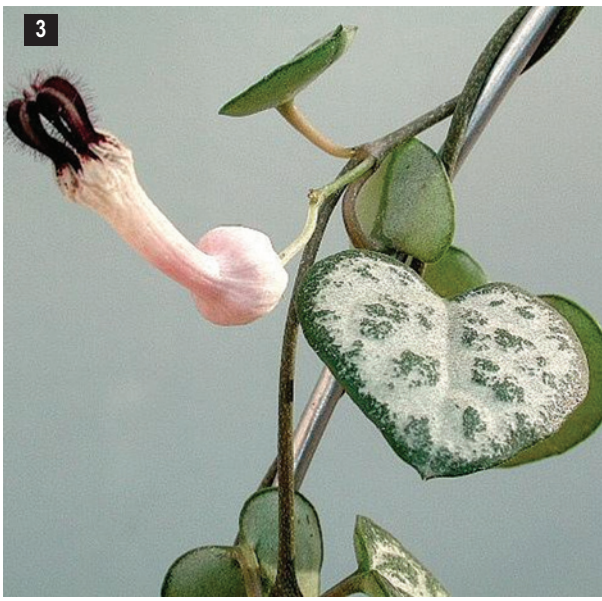
Ceropegia occulta **R.A. Dyer** This is a tuberous perennial which sometimes produces auxiliary tubers. Tubers are subglobose and up to 40 mm in diameter. The stems are up to about 20 cm long and straggling, rarely twining. The leaves are thick and fleshy. The flowers are produced successively, 1—3. They are erect with a small bulbous base, a thickish tube and lobes that are channeled and connivent. Their colour is whitish and heavily marked with pale lilac-red, with a yellowish colour on the inside and outside of the lobes which have short stiff cilia on the inside.



Dennis de Kock



Dennis de Kock



Loukie Viljoen



Unknown

1. ***Ceropegia haygarthii*** in cultivation
2. ***Ceropegia linearis*** in cultivation.
3. ***Ceropegia linearis* subsp. *woodii*** in cultivation
4. ***Ceropegia multiflora*** in cultivation
5 & 6. ***Ceropegia nilotica*** in cultivation
7. ***Ceropegia occulta*** in cultivation

Dennis de Kock



David Styles



Dennis de Kock



Distribution: Occurs from N of Pretoria to Mookgophong (Naboomspruit) and across to Mpumalanga and into Swaziland.

CEROPEGIA RACEMOSA **N.E. Br.** This very variable species does not have a tuber, but rather a cluster of fleshy roots. The stem twines up to about 2 m or more. The leaves are large and shiny green, sometimes hairy. The flowers are 2—several, developing successively from the leaf nodes. The base of the flower is only slightly inflated and the thickish tube curves upwards so that the lobes are sub-erect to erect. The colour is white becoming yellowish towards and on the lobes with longitudinal irregular reddish markings. Two subspecies are recognised; subsp. *racemosa* and subsp. *setifera.* The difference between the two rests only in small variation in the corolla and corona lobes and probably has no justification as the species is very variable.

Distribution: Occurs in N Namibia across to Limpopo Province, Mpumalanga, Swaziland, into central KwaZulu-Natal where it is uncommon and into tropical Africa. The subspecies *setifera* occurs in NE tropical Africa, through E Zimbabwe,S to S. Africa to central KwaZulu-Natal.

CEROPEGIA RADICANS **Schultr** This large-flowered species does not produce tubers. It arises from a cluster of long fleshy roots from which one to several annual slender climbing and twining stems are developed. The fleshy leaves are heart-shaped. One to three flowers are produced at the leaf nodes, the bases are somewhat inflated with the central slender tube curving upwards so that the lobes are erect to sub-erect. The differences between the corolla lobes is the separating factor between the two subspecies. The colour is somewhat variable with the outside pale creamy with purple blotches and the lobes are light-green. This species is inclined to be prostrate and roots at the leaf nodes.

Distribution: Occurs in the E Cape, where it is known from scrub bush near Komga.

CEROPEGIA RENDALLII **N.E. Br.** This species produces a small tuber up to about 30 cm in diameter, sometimes auxiliary tubers are produced. One to two slender annually developed stems are produced. In rocky, exposed places the stems are not twining and are short. But in bushveld conditions they twine readily up to 1 m in length into the shrubs. The leaves are fleshy. The flowers have a small bulbous base with a flaring tube which ends in a complicated canopy-shaped process of the 5—lobes. The colour varies from pinkish-white to pale pinky-yellow. The 'canopy' is green.

Distribution: Widely distributed from S Gauteng, northwards to the Soutpansberg, then across to Mpumalanga and Swaziland and then into N KwaZulu-Natal.

CEROPEGIA SANDERSONII **Decne.** This striking species does not produce a tuber but develops from a cluster of long fleshy roots. The fleshy twining stem grows in excess of 2 m. Two—4 flowers are produced in cymes which develop successively. The flower is green or whitish with green longitudinal striping. It has a smallish elongated basal inflation with a flaring tube culminating in a flattish canopy.

Distribution: Occurs from S Mpumalanga, across towards Maputo in Mozambique, Swaziland southwards to S KwaZulu-Natal.

CEROPEGIA STAPELIIFORMIS **Haw.** This species has a fibrous root system producing thick, tuberculate, fleshy, trailing to decumbent, to climbing and twining, stems which have hooked thorns. They root on contact with the soil. The leaves are rudimentary and the flowers are produced on short pedicels from peduncles produced along the branches. The flowers have only a small basal swelling with a long central tube which flares out at the apex with the lobes recurved outwards and the inside heavily pilose with long white hairs. The outside colour is creamy white and sometimes is greenish towards the apex with purplish longitudinal dots and striae. The lobes are deep purple. The subspecies *serpentina* differs mainly in the far less spreading of the corolla lobes which are often twisted at the apices.

Distribution: Distributed from Beaufort West in the west, S to Humansdorp and north eastwards to East London. The subspecies *serpentina* occurs from S of the Soutpansberg to N of Pretoria and across to Mpumalanga and into Swaziland and N KwaZulu-Natal.



David Styles



David Styles



Dennis de Kock

1. ***Ceropegia racemosa* subsp. *racemosa*** in cultivation
2. ***C. racemosa* subsp. *setifera*** in cultivation
3. ***Ceropegia radicans* subsp. *radicans*** in cultivation.
4. ***Ceropegia radicans* subsp. *smithii*** in cultivation
5 & 6. ***Ceropegia rendallii*** in cultivation
7. ***Ceropegia sandersonii*** in cultivation
8 & 9. ***Ceropegia stapeliiformis*** in cultivation
10. ***C. stapeliiformis* subsp. *serpentina*** in cultivation



Dennis de Kock



Dennis de Kock



Dennis de Kock

Loukie Viljoen



Dennis de Kock

Dennis de Kock



Dennis de Kock





***CEROPEGIA ZEYERHI* Schultr** This species has a cluster of soft fleshy roots and a slender leafless stem which branches sparingly. It scrambles or twines into the branches of shrubs. The leaves are rudimentary. The flowers are produced 1—3 from the leaf nodes. These have a bulbous base and a long central tube which bends the apex erect or suberect. The lobes are long and connivent with long vibratile clavate hairs on the inside of the corolla lobes. The colour is pale creamy-yellow with pale purplish striation. The corona lobes are greenish.

Distribution: It occurs from Ladismith in the W across to N of Port Elizabeth.

FOCKEA Endl.

The succulence of this small genus is in the swollen, sometimes very large, tuber which is usually subterranean or sometimes partially exposed. The stems twine up into trees or are independent. The genus has only 6 species, with one in Kenya and the balance in this region. The leaves are deciduous and the flowers have a tubular corolla. Two species are discussed here.

***FOCKEA CAPENSIS* Endl.** This species was formerly, more popularly but illegally known as *F. crispa*. It is also well-known by its vernacular name of *Kambroo* but some other plant species with subterranean tubers are also known as *Kambroo*. It forms a large perennial partially exposed tuber up to 65 cm in diameter, with the exposed portion rough and warty. The stems twine if in shrubbery or, in the open, it forms an untidy canopy over the tuber, which is often grazed. It produces a central growth-point which produces a number of slender erect to shortly pubescent twining stems up to about 1 m in length. The grey-green leaves are elliptic, densely pubescent with the margins strongly undulate and crisped without being revolute. Green flowers with twisted petals are borne in clusters, 1—5 in rapid succession. Similar in appearance to *F. edulis*.

Distribution: Occurs in the Little Karoo and in the northern bordering mountains, from the Warmwaterberg across to S of Prince Albert.

***FOCKEA EDULIS* (Thunb.) K. Schum.** The growth is similar to *F. capensis*, with the partially exposed tuber about 50 cm x 1 m across with a warty surface where exposed. The central growth point produces its aerial and perennial erect to twining stems up to 2 m in length. In bushy areas it can be a vigorous climber but in drier regions it assumes a small growth form. The leaves are glabrous to sparsely pubescent, with undulate margins. The flowers are yellowish-green with somewhat contorted petals.

Distribution: This is more widely spread than *F. capensis*, occurring from S KwaZulu-Natal in an arch, following the coastal line, southwards through Uitenhage, across to Bredasdorp in the SW Cape.

GERANIACEAE Juss.

The two genera dealt with here are *Pelargonium* and *Sarcocaulon*. The former includes plants with true stems and/or are leaf succulents or semi-succulents, sometimes with tubers. The genus *Sarcocaulon* has been subsumed into the genus *Monsonia*, a weedy species, which inclusion has not been upheld in this work. It includes both stem and sometimes leaf succulents

PELARGONIUM L. Hér.

***PELARGONIUM CARNOSUM* (L.) L. Hér.** This is a small shrub growing up to about 1 metre tall. It is a popular, well-known species and is widely distributed throughout southern Africa. It's forms a stout caudex underground and the thick stem is knobbly due to the formation of swollen nodes. The young branches are sparsely covered with whitish hairs which are soon lost. The leaf-structure is very variable and the leaves are usually pinnately divided and channeled along the midrib. These are either densely or sparsely pubescent. The inflorescence is also variable with the peduncles usually branched and with a terminal umbel of small white to greenish yellow flowers, usually cerise coloured in the throat.

Distribution: Widespread throughout the region, from S Namibia, most commonly from the Richtersveld, to near Cape Town, across to the drier parts of the E Cape and sparsely in the NW Cape.



Dennis de Kock



Ryan McNew



Valentino Vallichelli





Judd Kirkel Welwitch: picture + inset

1 & 2. ***Ceropegia zeyheri*** (1) in cultivation (2) Close-up of the flower
3 & 4. ***Fockea capensis*** (3) in habitat south of Laingsburg in the South Western Cape
Inset: close up of the leaves
(4) The apex of the large subterranean tuber. A plant in habitat near Laingsburg, showing the swollen tuber imbedded in the rocks
5 & 6. ***Fockea edulis*** (5) in cultivation The tuber is generally flatter in habitat with only the upper portion showing above ground. (6) The flowers, branches and stem
7. ***Pelargonium carnosum*** in habitat in the coastal Richtersveld near Port Nolloth



Valentino Vallichelli

Priscilla Burgoyne SANBI



Gerhard Beukes



Pelargonium ceratophyllum **L'Hérit.** This is a small succulent shrub growing up to 0.25 metres. Stems are fairly thin, up to about 12 mm in diameter. The succulent leaves are pinnate to bi-pinnate with thickly cylindric segments. The inflorescence has few flowers and these are borne usually on single but sometimes on branched peduncles. The flowers are white, yellow or light pink, sometimes with pinkish-red markings on the throat. The prominent stamens are orange.

Distribution: *Pelargonium ceratophyllum* has a limited dry-land distribution near to the W coast from Port Nolloth to Lüderitz.

Pelargonium cortusifolium **L.Hérit.** This attractive small species is similar to *P. crassicaule*. It grows to about 0.3 metres with stems up to 20 mm in diameter. It is characterised by the long semi-persistent stipules near to the apices of the stems. The cordate, simple leaves are sericeous, giving a silvery appearance. The inflorescence is borne on a pilose peduncle 10—40 mm or longer; the flowers have fairly long pedicels and are produced in an umbel of up to 12 flowers. Flowers are white to pink or lilac. This is a desert-dwelling species.

Distribution: This very attractive species is confined within a limited coastal desert area N and S of Lüderitz in Namibia.

Pelargonium crassicaule **L'Hérit.** This desert-dweller is similar to *P. cortusifolium*, but less robust and compact. It is a branched stem succulent about 20 cm tall and the stems are dark grey-black. Like *P. cortusifolium,* the tips of the stems have sharp stipules. The leaves are cordate, cuneate at the base and covered with a white, velvety indumentum. The inflorescence is produced one or more long peduncles from the end of the stems. The inflorescence is in the form of an umbel, sericeous and the flowers are pink to white, yellow, unmarked or suffused and marked at the throat with purple.

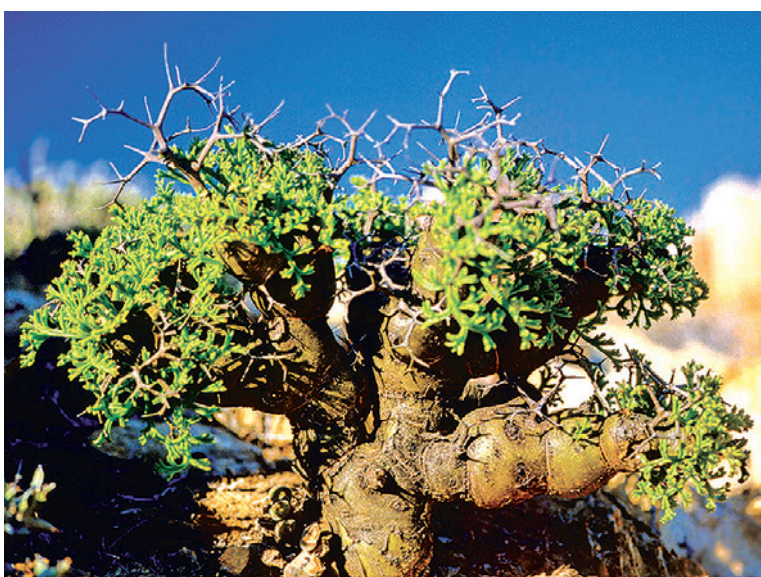
Distribution: This species is confined to a narrow strip of coastal desert from Lüderitz narrowly into the South African Richtersveld.

Pelargonium crithmifolium **J.E. Sm.** This much-branched, shrub attains the height of up to 0.5 m. The thick, knobby, succulent stems have smooth to peeling bark, are green to yellowish in colour. The leaves are narrow and much divided with a dilated irregularly toothed margin which is slightly pubescent. The inflorescence is large, and much–branched, becoming hard and thorny with age. The pseudo–umbels produce 4–6 flowers which are white with red markings near the base of the two upper petals.

Distribution: Occurs in the SW parts of Namibia, the Richtersveld, Namaqualand and the arid hotter parts of the SW Cape. In fissures in rocky outcrops.

Pelargonium crithmifolium showing its knobby, peeling stem and thorny, hard persistent inflorescence; on Kodas Peak, Richtersveld
Photo Gerhard Beukes
Left: in habitat in western Knersvlakte, N of Lutzville
Photo Robin Frandsen
Right: in habitat on Kodas Peak, Richtersveld
Photo Gerhard Beukes











Judd Kirkel Welwitch Picture & white flower. Gerhard Beukes. purple flower inset

1 & 2. ***Pelargonium crassicaule*** in deep sand near the Orange River at Brandkaros close to Alexander Bay. Inset: Flower-umbel from near the Orange River at Brandkaros
3 & 4. ***Pelargonium ceratophyllum*** (2) in habitat near Lüderitz, Namibia.. (3) A seedling in habitat near the Klinghardt Mountains, Namibia
5 - 6. ***Pelargonium cortusifolium***
(5) in habitat near Lüderitz
(6) A clear view of the flower umbel in habitat



Gerhard Beukes

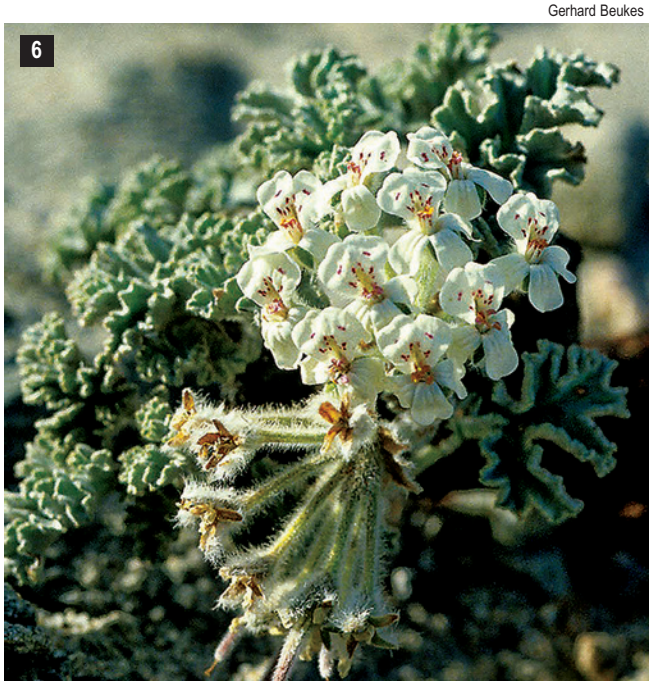


Gerhard Beukes

Gerhard Beukes



Gerhard Beukes



***Pelargonium dasyphyllum* E. Mey.** This small branched succulent deciduous shrub grows up to 0.2 m, rarely taller. The stems are greyish-green to greyish-brown. They appear to be glabrous but are minutely puberulous. Leaves are green with short glandular hairs. The inflorescence is branched, with umbels of up to 5 flowers. Flowers are white, rarely pink, without any markings.

Distribution: Occurs in a broad belt, up to 120 km wide along the Cape W coast from the Orange River to near Garies in the S.

***Pelargonium echinatum* Curt.** This erect, relatively thin, prickly–stemmed, species reaches a height of up to 60 cm. The branched, fleshy stem is armed with persistent recurved spine-like stipules. Leaves are cordate-ovate with crenulate margins. Leaves on the branches are much larger than those on the flowering stems. The inflorescence is a longish, simple peduncle with a panicle of 3–8 flowers coloured white, through pink to brilliant purple. The upper two petals are larger than the others and are marked with dark purple blotches.

Distribution: This attractive species occurs in Namaqualand from Clanwilliam in the S to the Richtersveld. It does not appear to occur N of the Orange River. It favours stony slopes in the overhangs of shading rocks.

***Pelargonium fulgidum* (L.) L.Hér.** This is a small shrubby species less than 1 m in height but when growing among other plants the supported stems may reach as high as 2 m. Stems are semi-succulent, becoming woody with age. The silvery, silky foliage makes this a very attractive species. The deeply incised leaves are oblong–cordate with long petioles covered with long silky hairs. The inflorescence consists of long, sometimes branched, peduncles with umbels of 4–9 flowers. Their colour ranges from scarlet to carmine without blotches or spots.

Distribution: Confined to the W Cape coastal regions from Yzerfontein in the S to near the Orange River mouth. Grows in exposed rocky slopes and sand hills.

***Pelargonium klinghardtense* Kunth** This is a stem succulent which branches mainly from the base with short or long stems. The colour is green to yellowish–green. It is easily recognised by its very characteristic leaves which are ovate–spathulate, appearing to be glabrous but are minutely pubescent. These are produced on short thick branches. The inflorescences are borne at or near the apices of the branches. The peduncle branches repeatedly and has smaller foliar leaves at the base. The peduncle hardens with age and is persistent for some time. The pure-white flowers are produced in small umbels of 2–4.

Distribution: This species has a limited distribution, being found on both sides of the Orange River, near the mouth, in the broken countryside, extending northwards to the Klinghardt Mountains. It is found on or against rocky hills and outcrops, wedged between rocks.

***Pelargonium paniculatum* Jacq.** This is a similar species to *P. crithmifolium*, differing in its non-persistent and more branched inflorescence and the persistent leaf bases on the stems. It is sparsely branched, up to 0.6 cm in height. Stems are erect, smooth but with persistent leaf-bases. The bark peels. Stems are apparently glabrous but are minutely pubescent, greyish–green becoming yellowish with age. The tall inflorescence is repeatedly branched with each branch bearing a terminal pseudo-umbel of 3–7 flowers. The flowers are white, cream or light pink with the apical two petals conspicuously marked with a purplish-red patch at the base.

Distribution: This distinctive species has a very limited distribution of a small area of approximately 100 km across in the extreme SW of Namibia. This is apparently a Namibian endemic.

***Pelargonium sibthorpiifolium* Harv.** This very distinctive deciduous species is a geophyte with a subterranean branch system. The branches comprise a series of oblong to interconnected spherical 'tubers' up to 80 mm long and 20 mm wide. The sub-cordate leaves are densely crowded and prostrate on the surface. They are dark, almost glossy and green. The inflorescence is borne on a short peduncle bearing 3–4, can be up 8, flowered umbels. Petals are more or less equal in length and are white or very light purple with conspicuous dark purple markings on the upper two petals.



Gerhard Beukes



Gerhard Beukes. Picture & inset



Gerhard Beukes. Inset Judd Kirkel Welwitch

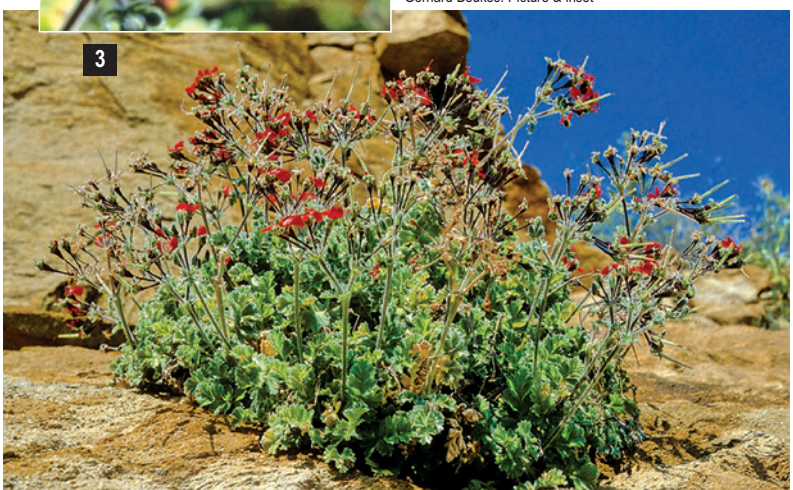


Gerhard Beukes. Picture & inset



Gerhard Beukes. Picture & inset

1. ***Pelargonium dasyphyllum*** in habitat north of Port Nolloth
2. ***Pelargonium echinatum*** with purple flowers in habitat the Spektakel Pass near Springbok
3. ***Pelargonium fulgidum*** in habitat at Holgat River north of Port Nolloth. Inset: flowers of the plant
4. ***Pelargonium klinghardtense*** growing at Bloeddrif in the Richtersveld. Inset: flowers in habitat of a plant growing at Brandkaros, NW Richtersveld
5. ***Pelargonium paniculatum*** Plant, with inset, in habitat at Zebrafontein near Witputs in Namibia.
6. ***Pelargonium sibthorpiifolium*** in habitat near Lüderitz



Gerhard Beukes



Gerhard Beukes

Distribution: This desert species is restricted to the extreme NW of the northern Cape, just south of the Orange River mouth, to near Lüderitz in Namibia. It occurs along the coast.

PELARGONIUM SPINOSUM **Willd** This is a sub-succulent, much-branched, aromatic shrub reaching up to 1.5 m in height and up to 2.5 m wide. Its uniqueness is in the enormously long petiolar spines. The yellowish-green stems are thin and armed with short stipes, which harden into pungent thorns. The long petioles are persistent, forming the sharp spines. The leaves are green. A short unbranched peduncle bears a single umbel of up to 10 large white to light pink flowers. The upper two petals are large with attractive striped purple markings.

Distribution: Occurs from north of Aus in Namibia, across to the coast and down to the Richtersveld and across to near Pofadder in Bushmanland in South Africa.

SARCOCAULON (DC.) Sweet

This interesting genus of highly-succulent stem succulents of the arid regions is endemic to southern Africa, has a wide distribution from northern Namibia, with outliers of one of the species as far north as Mossamades in Angola. They are most common along the arid coastal areas to north of Cape Town and across to east of Kimberley and south east to east of Graaff-Reinet and south to near Port Elizabeth. Some species are known as 'Bushman candles' as the dried stems will burn brightly by virtue of their wax content. The tough and impervious stems allow the plant to remain alive out of the ground for a long time. They have been known to re-root after being out of the ground for as long as 11 years. Sarcocaulons are always found growing out in the open. The plants are usually caducous, losing their leaves very early. The fragile and beautiful flowers often appear on the plants when no leaves are present. The transfer of this genus to the weedy genus *Monsonia* is not supported in this work.

SARCOCAULON CAMDEBOENSE **Moffett** This is a spiny bushy species, with thinner stems than the other members of *Sarcocaulon.* The stems are olive to dark-grey with rows of long simple straight spines which are the persistent remains of the long leaf petioles. The leaves have long and also short petioles and are glabrous. The flowers are up to 40 mm in diameter with white petals.

Distribution: Occurs on flat Karoo plains, favouring rocky areas, from N of Graaff-Reinet, SE to Pearston and in a general area south of this to N of Uitenhage across to Steytlerville in the W.

SARCOCAULON CILIATUM **Moffett** This is a semi-erect shrublet growing to about 0.2 metres. The branches are thin and straight, brownish to greyish-brown. The caducous to semi-persistent leaves have long and also short petioles. The long pedicels remain as sharp spines and the short petioles as blunt stalks. Leaves: almost decussate, obovate and recurved. They are puberulous to ciliate. Flowers are large, primrose-yellow and apically ciliate, borne on a sessile or short pedicel.

Distribution: *Sarcocaulon ciliatum* is confined to a narrow zone from Wallekraal in the S to just north of Lekkersing on the coastal plain between the coast and the nearest inland mountains.

SARCOCAULON CRASSICAULE **Rehm** This stem succulent has a tough coriaceous bark and is rigid and heavily armed with long thorns which are modified leaf petioles. It grows to about 0.5 m high and 0.5 m in diameter. The stems are grey to greyish-yellow. The caducous leaves are borne on long and short petioles, are puberulous to tomentose, sometimes glabrous. Leaves on the long petioles are almost decussate. Leaf–blades are crenate or dentate, narrowly to broadly obovate. Flowers are yellow to pale mimosa.

Distribution: This species is found from Lüderitz and the Haalenberg Mountains, southwards to the N, W and S Great Karoo, E of the Richtersveld mountains, Bushmanland, Tanqua Karoo and the Little Karoo.

Judd Kirkel Wellwitch





Gerhard Beukes. Picture & inset



Judd Kirkel Welwitch





Gerhard Beukes. Picture & inset



1. ***Pelargonium spinosum*** showing the mound-shape of a large flowering specimen in habitat Rosyntjieberg in the Richtersveld. Inset: close-up of the flowers of this floriferous species from Rosyntjieberg in the Richtersveld.
2 - 4. ***Sarcocaulon camdeboense*** the plant in habitat
(2) Showing a mature plant in flower.
(3) A young specimen showing stem detail
(4) Close-up of the flower
5. ***Sarcocaulon ciliatum*** in habitat on the Anenous Pass near Springbok.
Inset: Note the cilia on the edges of the petals from which the plant derives its name
6 & 7. ***Sarcocaulon crassicaule*** (6) in habitat at Eenriet, near Steinkopf in the south eastern Richtersveld. (7) In habitat 35 km N of Steinkopf

Judd Kirkel Welwitch



Judd Kirkel Welwitch



***Sarcocaulon flavescens* Rehm** This is an erect, thin-stemmed, spiny species. The stems are brown to greyish-yellow. The spines are thin and straight. The caducous leaves are puberulous, sometimes glabrous, broadly ovate to orbiculate, denticulate sometimes dentate. The flowers are primrose-yellow with the petals longer than broad.

***Distribution**: Sarcocaulon flavescens* has a limited distribution between the coast and the Richtersveld mountains, in a small area just N and S of the Orange River. They occur at the foot of the mountains and on the plains.

***Sarcocaulon herrei* L. Bol.** This is a rigid, short-stemmed shrublet covered with a hard, waxy, translucent bark. The stems are armed with long hard thorns, the remains of persistent leaf petioles. As many as 7 short persistent dry petioles remain as clusters around the base of the thorns. The leaves are ovate, simple, deeply segmented and covered with a dense whitish idumentum. The solitary flowers are produced on a long ciliate peduncle. They are hairy and white to pale yellow.

Distribution: This is a very localised species, apparently endemic to South Africa, occurring in the Richtersveld between Eksteenfontein and the Orange River.

***Sarcocaulon inerme* Rehm** This semi-erect or prostrate species grows up to about 0.3 cm high and 0.3 cm in diameter. The stem colours are grey-green to grey-white. The obovate, somewhat crenulate, leaves are arranged in rows of four and the only ones which are unsegmented in the genus. The short petioles are caducous or persistent where they are clustered and hidden in the leaf bases and are rarely longer than 6 mm. The leaves are glabrous above and tomentose below. The flowers are rose-purple to purple.

Distribution: Endemic to Namibia, occurring just N of the Orange River, up to Rosh Pinah, where it is plentiful at the base of the Numais Mountain.

***Sarcocaulon l'heritieri* Sweet.** This species is an erect shrublet with thin branches which are pale–coloured and waxy in texture. This spiny and fleshy plant grows to about 0.75m high to about 0.7m wide. Spines are long, thin, sharp and perfectly straight, pale brown to almost black. Leaves are characteristically folded, entire, glaucous and with an emarginate apex. Flowers are pale- to dark-yellow.

Distribution: Endemic to South Africa, occurring only in Little Namaqualand from the Knersvlakte to the southern parts of the Richtersveld, S of Eksteenfontein.

***Sarcocaulon marlothii* Engl.** This is an erect, spiny shrublet to large shrub up to 1.5 metres. The trunk is thick, with thickish branches tapering towards the apices. Colours are greyish-yellow to olive. The leaf blade is glabrous, fairly smooth, ovate to orbicular with denticulate edges. The persistent petioles are blunt, hard and end with a blunt, swollen point. Flowers are borne on a sub-sessile pedicel, they are dark rose to purple.

Distribution: Endemic to Namibia from north of the Brandberg and southwards to SW of Maltehöhe. It is confined to the escarpment but also occurs nearer the coast near Henties Bay.

Gerhard Beukes


5

Gerhard Beukes


6



Picture & insert Judd Kirkel Welwitch



Robin Frandsen



Gerhard Beukes



Judd Kirkel Welwitch

1. ***Sarcocaulon flavescens*** in habitat, near Ecksteenfontein in the Richtersveld
2 - 4. ***Sarcocaulon herrei*** (2) in habitat north of Steinkopf, E Richtersveld
(3) From near Eksteenfontein, Richtersveld
(4) Flower detail of the plant from Eenriet, near Steinkopf.

5. ***Sarcocaulon inerme*** from near Rosh Pinah, Southern Namibia
6 & 7. ***Sarcocaulon marlothii*** (6) Flower of a plant from near Henties Bay. Namibia
(7) A plant from S of Eksteenfontein, central Richtersveld
8 & 9. ***Sarcocaulon l'heritieri*** (6) in habitat near Swakopmund, Namibia.



Gerhard Beukes

Gerhard Beukes



Gerhard Beukes



Sarcocaulon mossamedense **(Welw. ex Oliv.) Hiern** Prostrate to semi-erect shrublet up to 0.3 m high and up to 0.4 m wide with branches less than 25 mm thick. The colour is grey to grey-white. The leaves are glabrous, somewhat wavy, broadly ovate to orbicular to erose-denticulate with a truncate to obtuse base. Flowers are pale rose with a white throat.

Distribution: This species is found in Namibia near Henties Bay in the S and near Cape Cross. An outlier population occurs N and E of Mossamedes in Angola.

Sarcocaulon multifidum **E. Mey. ex Kunth** This very attractive species is a dwarf, 0.2 cm high by about 0.25 cm in diameter, semi-erect plant with few generally horizontal branches. The colour is greyish-brown to grey. The leaves are bi-pinnate, pilose and tomentose, ovate, giving an intensely feathery appearance. Flowers are borne on a short pilose pedicel and are white, pale pink or magenta.

Distribution: limited to a very small area near the mouth of the Orange River on its either side. Approximately 10 km on either side and between 10–60 km from the mouth.

Sarcocaulon patersonii **(DC.) G. Don** This sarcocaulon is a semi–erect to prostrate shrublet, up to 0.5 cm in height to 0.5 cm in diameter. The stems are thick, pale grey to almost golden in colour, and covered with a hard, waxy bark with rows of single, thick spines arising out of clusters of short stalks at their axils. Leaves are long with short petioles, ciliate, caducous with the blade almost entire, narrowly to broadly obovate, Flowers are rose, pale magenta to purple.

Distribution: This extremely hardy species tolerates salt-spray at Lüderitz and extreme temperatures over most of its range. It occurs over three different habitats: On the Lüderitz peninsula and adjacent region, around the Haalenberg Mountains and S of Aus to the Orange River where it cross narrowly into the Richtersveld National Park and narrowly along the coastal strip from S of Lüderitz to N of Port Nolloth.

Sarcocaulon peniculinum **Moffett** This dwarf species is similar and closely related to *S. multifidum*. So close is it in morphology and habitat that, in the opinion of this author, it may well be best described as a variety of *S. multifidum*, rather than a full species. The plant is smaller than *S. multifidum.* being barely 0.1 cm tall and 0.2 cm in diameter. Stem colour is whitish–grey and they usually rest on the ground. The leaves have long petioles and are usually erect on the stems; the petioles are short and are pilose. They are persistent and blunt. The flowers are rose to pale pink, without throat markings.

Distribution: Found in a very limited area between Rosh Pinah and the Orange River, apparently endemic to Namibia. Occurs in very arid conditions.



Gerhard Beukes

Gerhard Beukes





Gerhard Beukes



Gerhard Beukes



Gerhard Beukes

1 & 2. ***Sarcocaulon mossamadense*** (1) The plant in habitat at Cape Cross, growing in deep sand, with the plant prior to dormancy.
(2) Flower detail of the plant from Cape Cross
3 & 4. ***Sarcocaulon multifidum*** in habitat near Alexander Bay. Inset: flower from a plant in habitat ar Arries Drift, Alexander Bay

5 & 6. ***Sarcocaulon patersonii*** (5) In habitat in the E Richtersveld
(6) The plant in habitat near Alexander Bay.
7 & 8. ***Sarcocaulon peniculinum*** (7) the plant in full leaf.
(8) Flowering in harsh conditions south of Rosh Pinah, southern Namibia.



Judd Kirkel Welwitch



Judd Kirkel Welwitch

Judd Kirkel Welwitch



Gerhard Beukes



***Sarcocaulon salmoniflorum* Moffett** This species is a semi-prostrate, many branched shrublet, less than 0.5 m high and up to 0.6 m in diameter. Stem colour is pale to olive grey. Leaves are entire, glabrous and elliptic. Spines are curved or straight. Flowers are almost white to salmon to orange-yellow.

Distribution: Very widespread, occurring from near Usakos in Namibia to the S E Great Karoo to Willowmore in the east. Its northern limit is South Africa is in the Kalahari Gemsbok Park. It also occurs in the south western parts of the Free State between Lückhoff and Fauresmith. It is common around Laingsburg and in the Tanqua Karoo. It avoids the coastal strip but occurs near Lekkersing and Eksteenfontein in the Richtersveld.

***Sarcocaulon venderietiae* L. Bol.** This is a low–growing, many-branched shrublet with thin branches and thin straight spines. Stem colour is dark grey to olive. Leaves are ciliate with the blade almost entire, cordate to broadly obovate. Leaves on the long spines are almost decussate. Flowers are palest yellow.

Distribution: This species is confined the E Cape, where it occurs around Willowmore east to Uitenhage, northwards to Beaufort West and Graaff-Reinet.

PASSIFLORACEAE Juss. ex Kunth.

Adenia Forssk.

This genus comprises plants with much thickened subterranean to pachypodous tubers or trunks with shortish hard branches (*A. pechuëlii*) to tall tree-like plants with thick long branches with thin short rebranches (*A. fruticosa*). It is represented from extreme desert conditions to open forest where the vines are often scandent on trees. The sap, flowers and fruit are very poisonous and documented cases of fatalities are reported, in particular from medicines prescribed by herbalists.

***Adenia fruticosa* Burtt Davy** This large species is up to 6 m tall. The stems are up to 1 m in diameter, green to grey-green with the branches green to yellowish-green. The secondary branches are thin and whip-like up to 20 cm in length, forming a very large tangled canopy over the stem. The green leaves are simple to trifarious. There are several subspecies which are not dealt with here, sufficient to say that the variation is in the shapes of the leaves.

Distribution: Occurs from the NE of Zimbabwe, southwards to Polokwane (Pietersburg) across to Mpumalanga and into N KwaZulu-Natal.

***Adenia glauca* Schinz** The base of the flattish and irregular stem of this species is up to 70 cm tall and about a metre in diameter. The deciduous branches, produced in the rainy season have 5-lobed leaves are divided to the base. The colour of the plant is greyish-green, becoming purplish in winter. The flowers are pale yellow and the ripe fruits are orange and split into 5 lobes.

Distribution: Occurs from the Waterberg in Limpopo Province, southwards to the Magaliesberg and across to Potchefstroom.

***Adenia peschuëlii* (Engl.) Harms** This is a desert-inhabiting plant which forms a very large grey-green rounded stem up to a metre in diameter with many thin branches which occur in tufts with tips that are lignified as thorns. The pachypodous stem usually anchors itself into the rock clefts and is almost impossible to move. The leaves are lanceolate, green and soon deciduous.

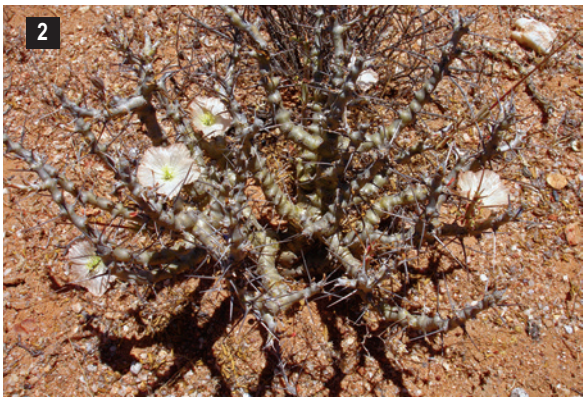
Judd Kirkel Welwitch





Gerhard Beukes picture. Judd Kirkel Welwitch inset

1. ***Sarcocaulon vanderietiae*** in habitat near Grahamstown
2 - 4. ***Sarcocaulon salmoniflorum*** (2) in habitat near Louisvale, SW of Upington.
(3 & 4) Colour variation in the flowers Showing the palest salmon and pinkish colour of the flowers
5 & 6. ***Adenia fruticosa*** (5) A younger, multi-stemmed and a gigantic specimen (6), from near the Kyle Dam, SE of Mashvingo, Zimbabwe. Inset, close up of the flower, photographed near Burgersfort in Mpumalanga, South Africa
7. ***Adenia glauca*** in cultivation: a small specimen with a tuber which will, with age, become very irregular with many stick-like side stems.
Inset: Close up of the flowers
8 & 9. ***Adenia peschuëlii*** (7) in habitat S of Sesfontein in the Kaokoveld, N Namibia showing the plant, in its leafless phase, wedged firmly in rocks
(8) The plant in leaf growing in open ground in habitat at Adenia Ridge



Gerhard Beukes





3. Judd Kirkel Welwitch 4.Gerhard Beukes



Judd Kirkel Welwitch picture & inset

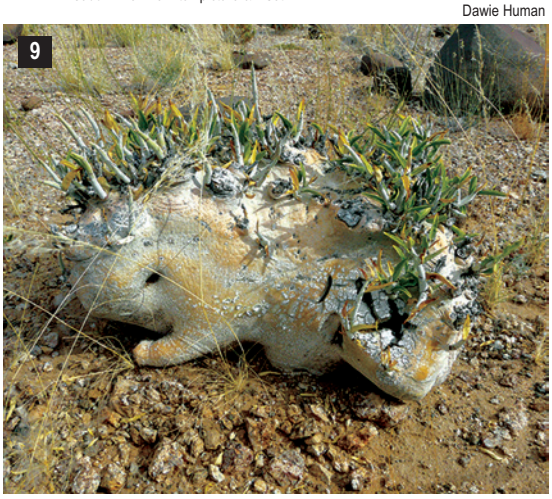


Judd Kirkel Welwitch



Judd Kirkel Welwitch.
Picture & inset

Dawie Human







Distribution: Occurs from Walvis Bay on the coast, across to the Tsaobis Nature Reserve and northwards to Omaruru.

ADENIA SPINOSA **Burtt Davy** A smaller species than *A. fruticosa*, it grows up to 2.5 m with the main stem somewhat squat, up to 2.5 m in diameter and grey-green to yellowish-green. It produces a long, rarely climbing branch, and a number of subsidiary thin branches from the top of the stem, all forming a tangled canopy above the main stem. Branches are armed with long recurved spines. The green leaves are simple to trifarious and the flowers are creamy.

Distribution: This species inhabits bushveld-type country from Polokwane (Pietersburg) in the E across to N of Mashishing (Lydenburg) and northwards to the Zimbabwe border and the Gwanda area of Zimbabwe.

DIOSCOREACEAE R. Br.

Eight genera are represented in these African, Madagascarene, Neotropical and Asian regions. Six genera of mainly tropical climbers are known. Southern Africa has only one genus and this is *Dioscorea* which includes the well-known 'elephants foot' or *D. elephantipes*.

DIOSCOREA L.

This genus was previously known as *Testudinaria* because the external tubers of some of the species have the appearance of a tortoise shell. Several species are represented in this area, of which *Dioscoria elephantipes* is the best known. Two species are dealt with here:

DIOSCOREA ELEPHANTIPES **Engl.** Well-known as the *Elephant's Foot*, because of its appearance, or as *Hottentots' Bread*, because of its edible tuber, this species can grow to an enormous size. In the E Cape its caudex is recorded as being 2–3 metres in diameter, with the climbing stems, branches and leaves massively covering large bushes. It is popular in cultivation and easy to cultivate but only from seed. It transplants readily. The plants develop canopies, which sometimes cover their caudexes.

Distribution: The species is found from N of Vanrynsdorp, across to Vanwyksvlei, southwards to Clanwilliam and across to the E Cape.

DIOSCOREA SYLVATICA **Eckl.** This climber develops a large caudex. The caudex is flattish and does not have the very testudinate hemispherical shape of *D. testudinaria*. Unlike that species it sometimes develops underground.

Distribution: Occurs from N.E. Zimbabwe to the SE Cape, where it sometimes occurs in deep forest.

EUPHORBIACEAE Juss.

This is a very large family represented internationally by around 300 genera of succulent or non-succulent trees, shrubs, creepers, vines and cactus-like plants which are found in this very diverse family. This group is well-represented in southern Africa. Three genera are represented in this book.

EUPHORBIA L.

The structure of the inflorescence of the euphorbias is unique in the floral kingdom. This highly specialised floral structure comprises a cyathium which contains the flowers. Each cyathium contains more than one flower, sometimes only male blooms, sometimes male and female and sometimes only female. The accompanying illustration (on P. 240) shows the complex structure of this unique inflorescence. The cyathia are sometimes very beautiful but are generally very small and are best viewed with a magnifying glass.

Many representative species of the region are presented here but the weedy plants are generally excluded. However, in order to show the incredible variation in the genus I have also included some of the ugly and strange, such as *E. verruculosa, E. melanohydrata* and *E. herrei*.

EUPHORBIA AERUGINOSA **Schweick.** This species is closely allied to *E. schinzii*. It is a spiny, erect to sub-erect, dwarf plant, up to 17 cm tall. The stem is thick, not tuberous and is subterranean, producing large numbers of branches. Branches are conspicuously 4–angled and almost cylindrical and sometimes spirally twisted and are bright green. The angles are armed with pungent, distinctively chestnut-coloured, spines up to 2 cm long. The spines arise from horny, separate shields. Cyathia are produced in solitary, sessile cymes with up to 3 cyathia horizontally disposed, arising from between the shields.



Darrel Plowes. Inset: Niels Jacobsen



Darrel Plowes



Ernst van Jaarsveld



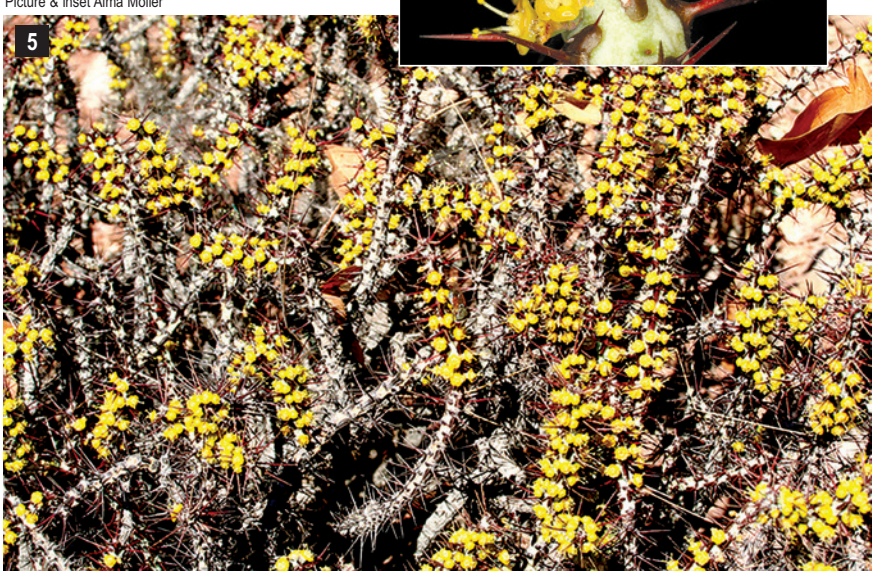
Picture & inset Judd Kirkel Welwitch

1 & 2. ***Adenia spinosa*** in habitat in SE Zimbabwe. Inset: flower detail
3. ***Dioscorea elephantipes*** Showing the prominant tubercles from which the vernacular name 'Elephant's Foot' is derived
4. ***Dioscorea sylvatica*** Showing the somewhat characteristically flattened tuber. This interesting species has a widespread distribution. It is sometimes encountered in deep forest.
Inset: Foliage & flowers of this climbing plant.
5. ***Euphorbia aeruginosa*** in habitat at Mutale Village, some 20 km W.S.W. of Pafuri Gate of the northern Kruger National Park.
Inset: Showing the bright yellow cyathia of this species, so characteristic of this sprawling plant





Picture & inset Alma Moller



Distribution: This species is common in the Limpopo Valley and adjacent areas in South Africa and Zimbabwe. Particularly large specimens are common in the Kruger National Park, N of Punda Maria.

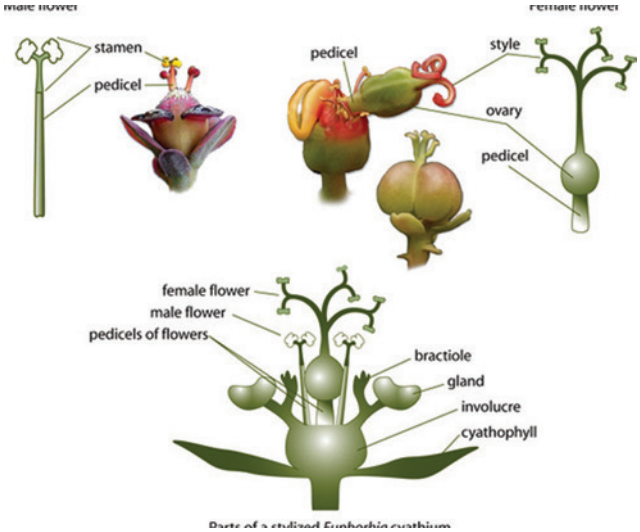


Illustration of a typical *Euphorbia* cyathium by Kandis Elliott. Illustration used with the kind permission of the Euphorbia Project, website http://www.euphorbiaceae.org

EUPHORBIA AGGREGATA **Berger** This is a unisexual, much-branched euphorbia, similar to *E. pulvinata*. The innumerable branches arise from a subterranean main stem to form a large tufted mass. The branches are usually up to 3 cm in height, they are grass-green on the growing apex and brown below. They are up to 9–angled and are armed with solitary, 6–8 mm long purplish to reddish spines. The cyathia are solitary at the apex of the branches. They are from red, through purplish to green in colour. This species is distinguished from *E. pulvinata* by its thinner more obtuse branches, more angles, a brighter-green colour and shorter puberulous spines.

Distribution: This species is an inhabitant of the E Cape from Cracock, through Somerset East to Willowmore and northwards to the Free State border, where it is found at Fauresmith in the southern Free State.

EUPHORBIA AVASMONTANA Dinter This large euphorbia has its erect to sub-erect many branches produced from a subterranean stem. The height is up to, and can be, in excess of 2 m. Branches are simple and only rarely rebranched, usually 5–angled rarely more. The paired spines are rigid and pungent on a continuous horny margin. Three yellow vertically disposed cyathia are borne in cymes, with the central cyathium being sessile and male and the two opposing ones are bisexual and borne on small peduncles.

Distribution: This species occurs from Prieska to W of Olifantshoek in the northern Cape across to Vioolsdrif and northwards shortly into Namibia.

EUPHORBIA ALBIPOLLINIFERA **Leach** This is a dwarf medusoid species. The body is sub-globose and tuberculate. The branches are few in number and are produced on the sides of the stem. The leaves are vestigial. The bisexual greenish cyathia are solitary on a sub-persistent peduncle which is up to 18 mm long.

Distribution: This species occurs from near Kirkwood to the Springbokvlakte, S of Kleinpoort, in the E Cape.

EUPHORBIA BARNARDII **White, Dyer & Sloane** This spiny succulent euphorbia rarely grows higher than 0.75 m The main stem is subterranean and the green to yellow branches are erect to sub-erect. In age they may rebranch. The branches, which are 5–6 angled, are constricted into segments. The edges are armed with paired pungent thorns and the spine shields are united to form a continuous grey horny margin. Solitary yellow cymes are produced on the terminal segments of the branches which dispose in usually three vertically arranged cyathia with the central cyathium male and sessile and the 2 outer being bisexual and raised on a short peduncle.

Distribution: This species is known from two small hills SE of Polokwane and SW of Phalaborwa, growing between sandstone boulders on NW facing slopes.

Alma Moller





Alma Moller



Alma Moller



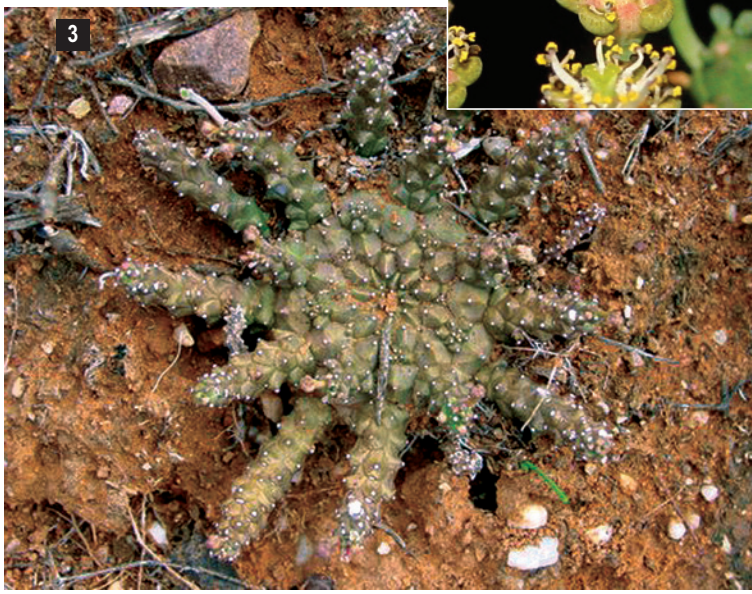
Alma Moller



Alma Moller



Picture & inset Rikus van Feldhuizen



Alma Moller



1 & 2. ***Euphorbia aggregata*** (1) in habitat south of Cookhouse, E Cape. Note the specimen of *E. ferox* in front in close association
(2) Showing the solitary cyathia arising between the spines
3. ***Euphorbia albipollinifera*** in habitat. Inset: The cyathia
4 & 5. ***Euphorbia avasmontana*** (4) A large stand at Groblershoop near to the Orange River in the N Cape.
(5) Showing the apex of a flowering stem
6 & 7. ***Euphorbia barnardii*** (6) in habitat near Burgersfort in south eastern Limpopo Province.
(7) Showing the flowering apex of a stem

Euphorbia bergii **White, Dyer & Sloane** This is a fairly widespread dwarf spineless species but with persistent peduncles. The partly buried elongated main stem is a continuation of a fleshy root. The branches are up to 15 cm in length. The stems are tuberculate with prominent leaf scars. The leaves are produced in a small tuft at the apex of the stems and the yellow cyathia are solitary, with 3—5 produced around the apex. The peduncles elongate at fruiting and are persistent.

Distribution: Occurs from Danielskuil, N Cape eastward and southwards across the SW Free State Province, across the Northern Province and S Botswana to the Nossob River Valley.

Euphorbia braunsii **N.E. Br.** This species forms a small mound, up to about 25 cm in diameter and up to 15 cm high. Its main stem, which is partially subterranean, branches laterally at or below ground level into a large number of densely crowded branches which rebranch. It is thornless but does have persistent long blunt peduncles. The yellowish-green cyathia are solitary, but occasionally in small cymes of up to 3, produced at the apex of the branches.

Distribution: This widespread species is found from near Prieska in the NW, southwards to Williston, Fraserburg, to Beaufort West and SE to beyond Willowmore.

Euphorbia bupleurifolia **Jacq.** This is a highly sought-after unisexual species. It has a globose to cylindrical stem which rarely branches. It grows to about 30 cm tall. The prominent tubercles are crowded into a neat spiral, topped with a leaf-scar. The leaves are in a tufted crown at the plant's apex. The deciduous leaves are up to about 7 cm long and 2 mm broad, lanceolate. The inflorescences are produced on a straight puberulous peduncle with the involucre bracts cupping a green cyathia.

Distribution: From S of Durban across to Camperdown, along a broad coastal stretch as far south as just NE of Port Elizabeth.

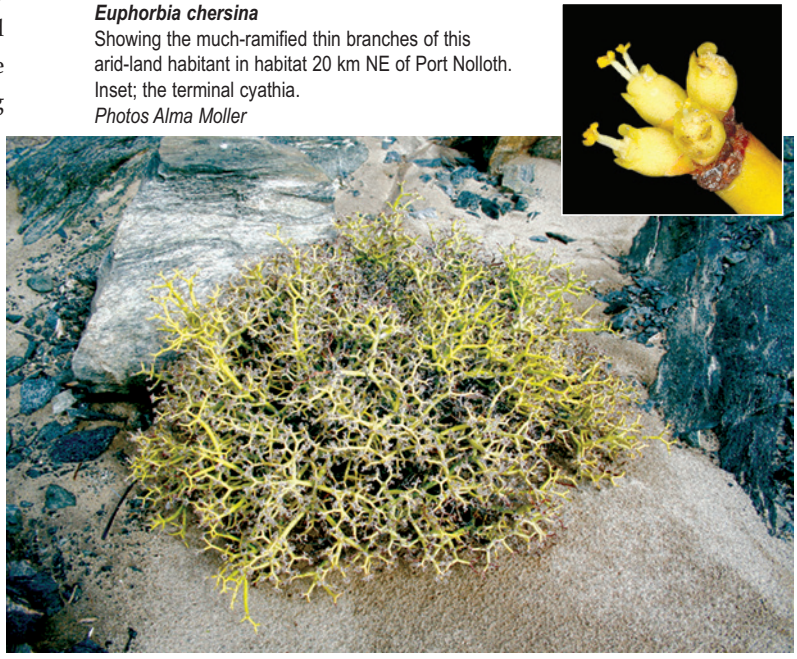
Euphorbia burmannii **E. Meyer** This is a spineless, shrub which branches freely from the base with opposite branches freely produced above, to form clumps up to sometimes in excess of 2 m. The slender stems are browsed by goats and sheep. Fruits are densely pilose and velvety to the touch. The inflorescence consists of a terminal cyme or an irregular raceme of several yellow cyathia.

Distribution: This widespread species occurs in abroad coastal and inland strip from Vanrhynsdorp in Namaqualand through Malmesbury, Worcester and eastwards to Fort Beaufort in the E Cape.

Euphorbia caput-medusae **L.** Because of its distribution this is one of earliest-known euphorbias, having been described by Linneaus in 1753. The name well-describes the species, having been named for the head of Medusa, the mythological woman-figure whose hair was a mass of writhing snakes. The branches arise from a globose body up to more than 15 cm thick, to form a mass of decumbent to erect stems as much as 35 cm in length. The branches are prominently tuberculate. The solitary apical cyathia arise on short peduncles from the axils of the tubercle, with the involucre bracts deeply toothed and coloured white, with red-colouring towards the tips. The central flowers are green.

Distribution: An inhabitant of the Cape Peninsula mountains and coastal sands, as far S as the southernmost tip of Cape Point.

Euphorbia chersina **N.E. Br.** This is a sprawling, spineless shrub up to 15 cm tall an about up to 20 cm in diameter. It is endemic to an arid habitat. The plant is



Euphorbia chersina
Showing the much-ramified thin branches of this arid-land habitant in habitat 20 km NE of Port Nolloth. Inset; the terminal cyathia.
Photos Alma Moller



Picture & inset Judd Kirkel Welwitch



Unknown

1. ***Euphorbia bergii*** in habitat near Danielskuil in the N Cape. Insets: Close-ups of the cyathia
2 & 3. ***Euphorbia braunsii*** (2) In habitat near Carnarvon, N. Cape
(3) In habitat near Rietbron, NW of the eastern Cape. Inset: its two cyathia
4. ***Euphorbia burmannii*** in habitat between Addo Village and Colchester, E Cape. Inset: fruited terminal peduncle and its cyathia
5. ***Euphorbia bupleurifolia*** This attractive species is much sought-after in collections
6. ***Euphorbia caput-medusae*** in habitat on the side of Table Mountain, Cape Town

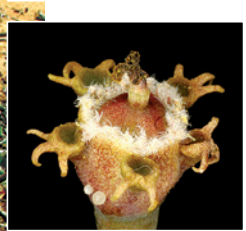


Andries Cilliers

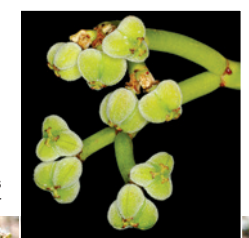


Priscilla Burgoyne SANBI





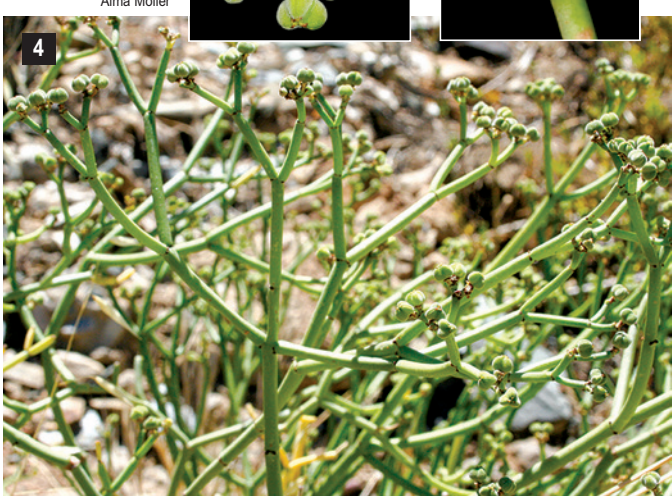
Picture & inserts Alma Moller





Picture & inserts Alma Moller





repeatedly branched, with thin branches up to 7 mm thick, from the base, with each primary branch ending in a cluster of very small yellow cyathia.

Distribution: From Lüderitz in the N, S through the Richtersveld to as far S as the Kamieskroon region and eastwards to the Botterkloof, NE of Clanwilliam.

EUPHORBIA CLANDESTINA **Jacq.** This is a spineless erect shrub, usually simple but sometimes branching from the base or its lower parts, is up to 65 cm tall. The stems are cylindric and sometimes obscurely clavate and heavily tuberculate, the tubercles are spirally produced. The narrow lanceolate leaves, up to 4 cm in length, are produced in a crown at the apex of the plant. The cyathia are produced in the axils of the tubercles and are sessile and solitary. The involucre is purplish and the flowers are green.

Distribution: On either sides of the Langeberg mountains, S of Swellendam and Riversdale to Mossel Bay, into the Little Karoo where it occurs from W of Oudtshoorn across to Uniondale.

EUPHORBIA CLAVARIOIDES **Boiss**. Generally this compact mat-forming is a mountain-loving medusiod but is also found on the plains. The plant, which can be very large, consists of a main, thick and fleshy, obconic stem with a cushion of densely-packed branches, numbering in the very many hundreds. The branches are tessellate and are coloured grey-green to green, tinted purple. The inflorescence consists of a solitary, sessile cyathium. Two varieties are recognised: var. *clavarioides* and var. *truncata*. The variety *truncata* is distinguished principally by its flat, rather than rounded growth habit. It is produced almost flat with the ground level.

Distribution: This is a widely-spread species. The variety *clavarioides* occurs in the W and central Free State, Botswana, the NE Cape and Lesotho. The variety *truncata* occurs in the N Free State, N of the Vaal River and KZN-Natal.

EUPHORBIA CLIVICOLA **R.A. Dyer** This is a rare and endangered plant. It grows from a central stem which produces many pale-green branches. The branches are armed with paired short, pungent thorns. The plant favours growing among rocks which it covers in tufts of up to and sometimes more than 1 m in diameter. The cyathia are yellow and small and are produced from eyes above the thorns.

Distribution: This endangered species is known from two localities: about 7 km N of Polokwane and in the Percy Fyfe Nature Reserve in Limpopo Province.

EUPHORBIA COERULESCENS **Haw.** This is arguably the most prolific of the euphorbias of southern Africa. It covers vast areas of the E Cape, where the region is known as the 'Noorsveld" (*noors* = spiny, *veld* = country). The species is a good source of food for livestock. The name *coerulescens* (more correctly *caerulescens*) is derived from the bluish colour of the very spiny stems. The thorns are bifid and arise from a horny shield which is not continuous. The plant reaches a height of 1.5 m or more and the branches are up to 5 cm thick. The plant spreads underground to give rise to stiffly erect young plants. The branches, which rebranch quite freely, are markedly constricted into segments. The cyathia are borne on cymes near the apices of the branches, they are vertically disposed with the central cyathium being male and the two laterals being bisexual. The cyathia are uniformly yellow.

Distribution: Jansenville seems to be the centre of this very prolific species. It occurs commonly in the Somerset East, Steytlerville and Uitenhage districts. A small disjunct population is found at the Calitzdorp Dam, Little Karoo.

EUPHORBIA COLLICULINA **White, Dyer & Sloane** The caudex of this medusoid 'euphorbia of the hills' is generally almost subterranean and it forms numerous branches which are arranged rosulately around the depressed apex of the stem. The branches are tessellately tuberculate and are

Euphorbia colliculina in habitat in the eastern Little Karoo, showing the plants in flower *Photo Robin Frandsen*







Alma Moller



Kuba Jilemicky

1. ***Euphorbia clandestina*** A plant in habitat south of Ladismith, Little Karoo.
2 & 3. ***Euphorbia clavarioides*** (2) in habitat near Winburg in the Free State Province. (3) A close up of the plant showing the cyathia and ripe seed pods.
4. ***E. clavarioides* var. *truncata*** The characteristic flattened apex of the plant in habitat in the northern Free State Province
5. ***Euphorbia clivicola*** the plant in habitat north of Polokwane growing in association with a seedling of *Aloe marlothii.* Inset: The cyathium of this rare plant.
6 & 7. ***Euphorbia coerulescens*** (6) the plant in habitat (7) A picture of the flowering apex of a specimen showing an apical section of the plant with its yellow cyathia. Note the separate spine shields



Priscilla Burgoyne SANBI



David Frandsen

Alma Moller

Priscilla Burgoyne SANBI



Judd Kirkel Welwitch





tipped with white scars from the fallen vestigial leaves. These are green and are produced in a small rosette at the apex of the new growth. They are soon deciduous. The inflorescence is a solitary cyathium on a short pedicel. The involucre glands are bright red to greenish-yellow.

Distribution: Its natural habitat is confined to the Little Karoo, W of Oudtshoorn.

EUPHORBIA CONFINALIS **R.A. Dyer** This is a large candelabriform tree reaching up to more than 10 m in height. The gnarled main trunk may develop secondary trunks. Each trunk develops a cupular-shaped crown of usually 4–angled branches, with clearly-defined segments. These in turn may further develop small secondary branchlets. The angles of the branches are armed with slender spines up to 6 mm in length. The horny spine-shields are continuous. The yellow cyathia are generally in groups of three with the central cyathium being male and the two outer are bisexual. The seed capsules are ruby-red.

Distribution: This 'Lebombo *Euphorbia*' is from northern NE Swaziland, northwards into SE Zimbabwe and narrowly into the adjacent Mozambique.

EUPHORBIA CONFLUENS **Nel** This dwarf medusoid euphorbia grows up to 11 cm high and up to 35 cm in diameter. It is similar to *E. tuberculata* but differs in being smaller and it also frequently ramifies at the apex of the branches. It has a central stem which is partially buried and it branches prolifically with green, prominent tubercles. The leaves borne at the tops of the branches, are sessile linear, up to 2 cm long and soon deciduous. The solitary bisexual greenish cyathia are borne on somewhat persistent peduncles of up to 3.5 cm in length.

Distribution: Occurs on the sandy flats of the S central Richtersveld.

EUPHORBIA COOPERI **N.E. Br. ex A. Berger** This too is a large candelabriform species, though not as tall as *E. confinalis*. It is however more robust and altogether a more 'tidy' plant. It grows up to 8 m tall with a naked trunk up to 3 m tall. The crown of sub-erect, clearly-defined segmented branches is in a neat cup-shape and is easily recognisable by this shape from even a young plant. It is sometimes confused with *E. ingens*, but not readily. The branches are 6-angled and deeply winged edged with a horny continuous shield with paired pungent spines up to 7 mm long. The vertically disposed sessile yellow cyathia are generally vertically arranged in threes, with the central cyathium being male and the two adjacent being bisexual. The ripe seed capsules are a dark red and contrast starkly with the green of the branches. These are produced at the very apex of the branches on the last segment.

Distribution: This widespread species occurs un the NE KwaZulu-Natal, E Swaziland, the lowveld of Mpumalanga and Limpopo Province, across the entire Limpopo Province and the N parts of the South West Province, across into E Botswana and S Zimbabwe as far north as the Matopos and Bulawayo.

EUPHORBIA CRASSIPES **Marloth** This 'thick-footed' plant is named for its heavy main stem. It is up to 15 cm in diameter. It is closely related to *E. fusca*. Like the other medusoid species the central bare stem-apex is surrounded by rosulately arranged erect to sub-erect branches, which have persistent hard peduncles. The central stem is not furrowed like *E. fusca* but is flattened. The cyathium is greenish in colour.

Distribution: It is confined to near Beaufort West.

EUPHORBIA CRISPA **(Haw.) Sweet** The name is derived from the crisped or wavy leaf edges. This dwarf species has a subterranean tuber with the crown of crisped leaves about 5 cm long above ground. The leaves are lanceo-late, green, slightly folded together, with a prominent lighter-coloured central rib. The inflorescences are produced in umbels of solitary or up to 5 separate yellow cyathium. This work does not accept the transfer to *E. tuberosa*, which is similar but does not have the crisped leaf margins.

Robin Frandsen





Alma Moller



Robin Frandsen



Alma Moller



Robin Frandsen

1. ***Euphorbia confinalis*** in habitat in the Limpopo National Park, Mozambique, east of the Northern Kruger National Park.
2. ***Euphorbia confluens*** in habitat in deep sand, about 25 km east of Port Nolloth. Inset: The bisexual cyathium
3 - 5. ***Euphorbia cooperi*** (3) in habitat in Mpumalanga. (4) An apical portion a of branch of the species showing flowers (5) In fruit in Mpumalanga
6. ***Euphorbia crassipes*** in habitat and inset the cyathia with their characteristic greenish glands
7 - 9. ***Euphorbia crispa*** (7) in fruit in habitat just north of Loeriesfontein (8 & 9) Plants in habitat with cyathia and fruit



Robin Frandsen. Inset Alma Moller



Picture & inset Rikus van Feldhuizen

Darrel Plowes



Darrel Plowes





Distribution: Fairly widespread in the W Cape, from Malmesbury across to the Koue Bokkeveld and northwards to Loeriesfontein.

Euphorbia davyi **N.E. Br.** This is a dwarf plant with a subglobose, to elongated stem with the apex without branches, which contract into the main root. The greatest part of the tuberculate stem generally rises up to less than 4 cm above ground. The branches are in 2—3 series, up to more than 6 cm in length. They are heavily tuberculate. and the apices are crowned in the growing season with longish, lanceolate ephemeral leaves. The inflorescence consists of solitary green cyathia arising between the leaves on a longish stalk.

Distribution: The species is fairly common on sandy flats N of Pretoria and in a broad, westerly tending swath up to the Waterberg and into Botswana, where it occurs in the S and SE parts and also in SW Zimbabwe S of the Matopos and S of Gwanda.

Euphorbia decidua **P.R.O. Bally & L.C. Leach** This interesting and much sought after dwarf dioecious species is borne on a thick underground turnip-shaped tuber. The branches develop from the apex of the tuber. Two stages of growth of the branches are seen: Firstly a number of sterile, many-angled deciduous branches are produced. These are followed by the flowering peduncles. The cyathia are simple and are greenish-yellow.

Distribution: Occurs and is widespread in the N parts of Zimbabwe from NW of Karoi across to Mt Darwin. It is also found in the S central Zambia.

Euphorbia dregeana **E. Meyer ex Boiss.** This is a tall shrub, fairly common in its range, growing up to 2 m in height. The stems radiate from the base and are up to 3 cm in diameter and can be up to 5 cm in large plants. The colour is grey-green to yellowish. Leaves appear on young growth but are soon deciduous. The yellow cyathia are produced on alternate peduncles with 2—several on a peduncle.

Distribution: Occurs on sandy flats, pebbly plains of hill-slopes from Kamieskroon in South Africa in the S to Aus in Namibia.

Euphorbia enopla **Boissier** This unisexual species can grow as tall as 1 m. It grows into a dense bush, branching at the base and rebranching. The stems are glaucous green to greenish-grey except at the apex where they are light green tinged with purple. The strong, rigid pungent spines, which are modified peduncles, are numerous along the angles, red becoming blackish and then grey with age. The dark-red cyathia are solitary and are borne on a long peduncle.

Distribution: Occurs in an extensive band from W of Laingsburg in the Witteberg Mountains across to E of Steytlerville and northwards to Graaff-Reinet.

Euphorbia enormis **N.E. Br.** This is a dwarf sharply-spined euphorbia which is characterised by a thick subterranean stem which is a continuation of the root. a few stemlike branches arise underground from the tuberous root and these have a few branches which are above ground. These are solitary or sometimes branching at the base, are somewhat contorted and are green with lateral creamy-yellow feather-like markings. The angles are armed with conical pungent paired thorns. The spine shields are discontinuous with the flowering eye just above the thorns. Just above the thorns is a pair of prickles, near to the flowering eye. The cymes are solitary and are generally produced near or at the apex of the stem and produce 3 vertically deposed yellow cyathia.

Distribution: Occurs in the region between Lydenburg and Burgersfort in Mpumalanga and widely in the Polokwane (Pietersburg) district.

Euphorbia ephedroides **E. Meyer** This strange shrub is usually very small, up to about 40 cm in height but sometimes reaching up to 1 m. The thin branches branch from the base and frequently rebranch fork-like. The branches are brittle at the joints and the primary branches are about 4 mm thick and smooth. The secondary branchlets are erect, to sub-erect and forked. The young stage of the inflorescence is solitary and produced at the ends of the branchlets and develops into a cyme of up to 4 yellow cyathia.

Distribution: Occurs in the Richtersveld and in the region S of Steinkopf towards Kookfontein and Koperberg in the W Cape.



Judd Kirkel Welwitch





Michael Kimberley



Picture & inset Alma Moller



1. ***Euphorbia davyi*** in habitat north of Pretoria
Inset: cyathia
2. ***Euphorbia decidua*** in habitat in northern Zimbabwe
3. ***Euphorbia dregeana*** in habitat near Khubus, Richtersveld. Inset: Close-up of the umbel of the cyathia
4. ***Euphorbia enormis*** in habitat near Burgersfort. Inset: cyathia on a plant from near Penge
5 & 6. ***Euphorbia enopla*** in habitat about 25 km south west of Laingsburg
(6) A close up of fruited stems
7. ***Euphorbia ephidroides*** in habitat in the Namaqua National Park. Inset an umbel of fruiting cyathia on a plant from the Richtersveld National Park



Picture & inset Gerhard Beukes



Picture & inset Alma Moller



Robin Frandsen



Alma Moller



Euphorbia esculenta **Marloth** This is a spineless species with a large obconic or clavate tuberculate stem, mostly subterranean, which produces rosettes of numerous cylindric, tuberculate, glabrous and truncate branches. The top of the stem does not branch. The leaves are rudimentary and are soon deciduous. The solitary green to brown cyathia, have bracteoles covered with white 'wool'. These are produced in clusters at the apex of the stem.

Distribution: Occurs in large number, often in association with *E. horrida* from W of Uitenhage, northwards to Somerset East and in a broad band across to Jansenville and northwards to Graaff-Reinet.

Euphorbia eustacei **N.E. Br.** This small, many-branched euphorbia is characterised by its tufted nature, caused by the crowded leaves. The tubercles are not prominent and are coloured light green. The spines, which are modified peduncles, are white and rigid. The broad leaves are deciduous. The solitary cyathia are produced near the apex of the branches from the axils of the rhomboidal areas.

Distribution: Seems to be confined to the region around Matjiesfontein, in the S Great Karoo.

Euphorbia excelsa **White, Dyer & Sloane** This is a tall, spiny tree growing up to 10 m tall. The trunk rarely produces side shoots and is crowned with spreading and erect branches which rebranch freely. These are about 6 angled and the margins have a continuous hard horny edge which is armed with about 8 mm long divergent spines. The flowering eyes have a solitary cyme which usually has 5 horizontally disposed yellow cyathia, with the central one male or rarely bisexual and the 4 lateral are usually bisexual.

Distribution: East of Penge to N of the Olifants River, and W of Burgersfort on the Lulu Mountain to near Ohrigstad.

Euphorbia fasciculata **Thunberg** This attractive solitary-stemmed plant, up to 30 cm in height, is spineless but with persistent hard peduncles. Similar in appearance to *E. restituta*, but that plant is multi-branched. The large, hexagonal, prominent tubercles are arranged spirally. The leaves are rudimentary and soon-deciduous. The peduncles of the inflorescences are produced from the cavity near the apex of the tubercles. They are long and stout, withering after the fall of the cyathia, but persisting for several seasons. The flowers are produced in rays from the apex of the peduncle. An interesting characteristic of plants in habitat is that are reputed to bend in a northerly direction towards the midday sun.

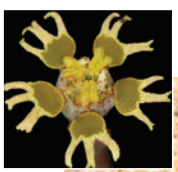
Distribution: From the region of Vanrhynsdorp southwards to Clanwilliam in the NW Cape.

Euphorbia ferox **Marloth** This is a unisexual very spiny, large clump-forming species, which branches underground and near the surface. It forms clumps of up to 60 cm in diameter, with stems up to 15 cm tall. The branches are up to 4.5 cm thick, dull green with 9—12 angles. The pungent spines are modified peduncles. They are solitary, many and persistent and up to 2 mm long. The yellow cyathia are solitary, with up to 6 being produced at the apex of the stem on peduncles up to 6 mm in length.

Distribution: Occurs from Steytlerville in the S, northwards to near Graaff-Reinet and to the W of the Great Karoo.

Euphorbia filiflora **Marloth** This is an attractive dwarf unisexual euphorbia which grows up to 30 cm tall. It has a short, thick main stem with radiating tuberculate branches up to 20 mm thick which are bright green. The prominent tubercles are arranged spirally. The cyathia are solitary, bisexual and borne on a long persistent peduncle which is up to 4.5 cm long. The cyathia are green with yellowish palmate appendages.

Distribution: Occurs in a relatively limited range on the higher plateaux from near Springbok in the S, northwards along the E edge of the Richtersveld.





Euphorbia filiflora In habitat in the eastern Richtersveld, north of Steinkopf. Inset: the unisexual cyathium *Photos Alma Moller*



Robin Frandsen. Insets Alma Moller



Alma Moller



Robin Frandsen

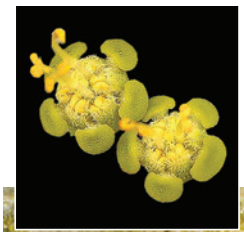
Alma Moller



Judd Kirkel

1. ***Euphorbia esculenta*** in close association with *E. horrida* (above left) in the Springbokvlakte, SW of Kleinpoort in the eastern Cape. Inset: Two views of the cyathia showing the woolly involucres and prominent black glands
2. ***Euphorbia eustacei*** in habitat at Matjiesfontein
3 & 4. ***Euphorbia excelsa*** In habitat near Ohrigstad in Mpumalanga
5 & 6. ***Euphorbia fasciculata*** (5) in habitat north of Vanrhynsdorp.
(6) An umbel of cyathia
7. ***Euphorbia ferox*** 50 km NE of Graaff-Reinet. Inset: The twin cyathia

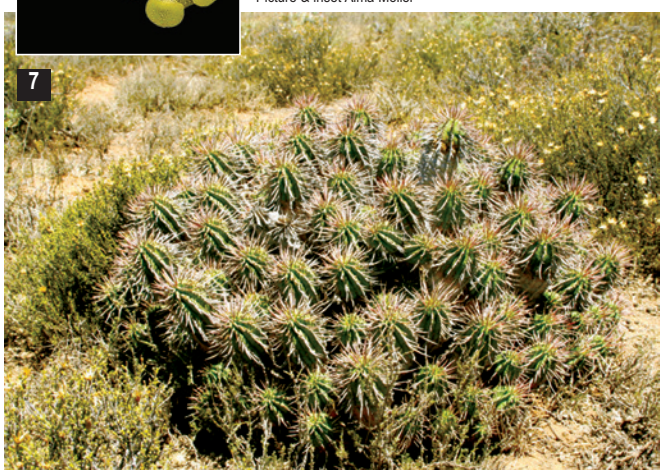




Picture & inset Alma Moller

Alma Moller





Euphorbia fusca **Marloth** This attractive 'Gorgon's Head' species produces a caudex which can be as large as 20 cm in diameter and 30 cm tall. The thin branches can cover the entire stem or leave the apex somewhat open. The tessellate tuberculate branches are spineless but with persistent peduncles. The solitary cyathia are clustered at the apices of the branches on peduncles up to 2 cm long. Their colour is brown with long fluffy white inner hairs.

Distribution: Widely distributed in the upper and central Great Karoo, Britstown and narrowly in the N Little Karoo; westwards through Upington to Witsand and Warmbad in S Namibia and into Botswana.

Euphorbia gamkaensis **J.G. Marx** Long believed to be conspecific with *E. crassipes*, this distinctive green species is characterised by a very shallow involucre with a hairy ovary on its cyathia. The body is globose, up to 90 mm in diameter with small branches and persistent peduncles, except at the slightly depressed apex. The green to reddish cyathia are solitary at the branch-tips.

Distribution: South of Calitzdorp in the Little Karoo, especially along the Gamka River.

Euphorbia gariepina **Boiss.** This is a dwarf spineless shrublet with thin light green stems, up to 50 cm tall, which branches and spreads from the base. These rebranch to form a dense tangled mass up to 60 cm across. The cyathia are produced on terminal cymes with peduncles up to 40 mm long, branching to bear a unisexual cyathia.

Distribution: E Richtersveld NP, away from the fog zone and along the Orange River Valley, common near Aggeneys, to as far W as Douglas, E of Upington, northwards into the Namibian Sperrgebiet and across to the Great Karasberg.

Euphorbia gatbergensis **N.E. Br.** This is a spineless dwarf plant which has its main stem partly subterranean. The unbranched apex of the stem is flattened and depressed and is surrounded by short tessellated branches which are sparsely crowned with yellow solitary fragrant cyathia.

Distribution: Common in the grasslands S of Elliot near Gatberg in the E Cape.

Euphorbia gentilis **N.E. Br.** This dwarf euphorbia is a much-branched species up to about 10 cm tall. The green and purple-mottled, stems appear to be glaucous but are rough to the touch. They are brittle and jointed. The rudimentary leaves are sessile. The plants are dioecious but sometimes with bisexual cyathia on the male plants.

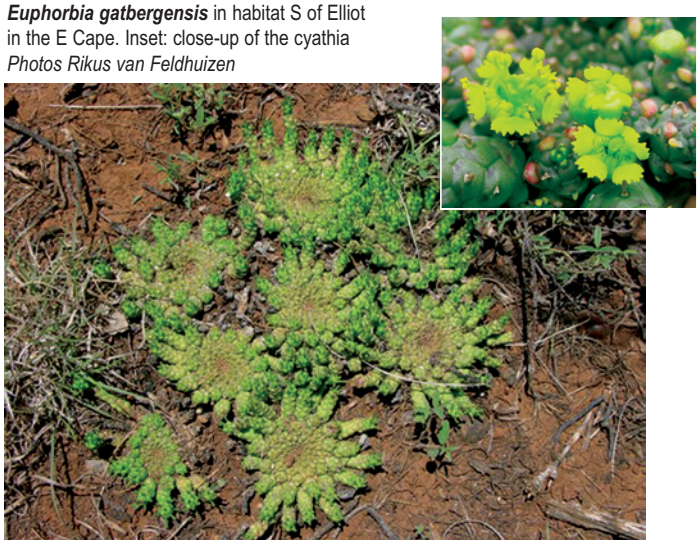
Distribution: Occurs from SW of Springbok, through Loeriesfontein across to Williston and S to the Ceres Karoo.

Euphorbia globosa **(Haw.) Sims.** This species is distinguished, together with a very few others such as *E. polycephala*, by its above-ground, compact habit with long, finger-like processes on the cyathial gland. The species forms clumps of few to many nearly spherical, greenish-brown to reddish heads, lying flush on the ground. The cyathium is solitary or 2 or more at the apex of the flowering branch and has the characteristic finger-like processes like birds claws.

Distribution: Has a strictly coastal distribution around Port Elizabeth in the E Cape.

Euphorbia gorgonis **A. Berger** This dwarf medusoid euphorbia is comprised of a thick central stem with attenuated branch formation. It very rarely produces side branches. It grows almost flat on the ground with only the apical portion of the flattened stem above ground. The short branches are produced in 3 to 5 series. The central stem area is prominently tuberculate, dull green to purplish tinged. The reddish to yellowish cyathia are solitary and are produced on a short peduncle with prominent dark purple ovoid glands below the involucre.

Euphorbia gatbergensis in habitat S of Elliot in the E Cape. Inset: close-up of the cyathia
Photos Rikus van Feldhuizen

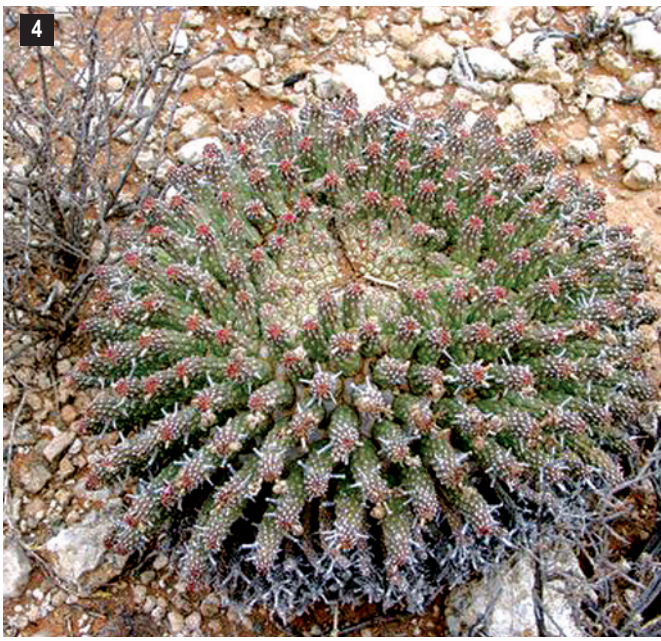








1 & 2 Alma Moller, 3 Rikus van Feldhuizen



Rikus van Feldhuizen

1 - 4. ***Euphorbia fusca*** (1) in habitat near Britstown, N Cape. (2 & 3) Cyathia on the tips of the branches. (4) In habitat.
5. ***Euphorbia gamkaensis*** in habitat S of Calitzdorp with the cyathium (inset)
6. ***Euphorbia gentilis*** in habitat near Loeriesfontein
7. ***Euphorbia gariepina*** in habitat near Groblers-hoop, near to the Orange River. Inset: Showing the unisexual cyathia, with the male flowers branching from the central female flower
8. ***Euphorbia globosa*** in cultivation, a plant from near Port Elizabeth Inset: the cyathium



Alma Moller



Picture & inset Priscilla Burgoyne SANBI

Picture & inset Alma Moller





Judd Kirkel Welwitch. Inset Alma Moller



Distribution: In the E Cape in the Uitenhage district, to Uniondale, near Port Elizabeth and the Albany districts.

EUPHORBIA GRANDIALATA **R.A. Dyer** This is a spiny succulent shrub, similar in appearance to *E. grandicornis,* growing up to about 2 m in height. The generally four-angled branches radiate at ground level from an underground stem. The segment-angles of the branches are attractively marked with yellow lines radiating to the flowering eyes. The angles have a continuous horny shield with usually 2 paired pungent spines, considerably shorter than those of *E. grandicornis*. Cymes are in threes, but may be single with 3 cyathia vertically disposed, the central cyathia is sessile and soon deciduous and the two adjacent cyathia are bisexual and raised on a small peduncle. This rare species is not particularly threatened.

Distribution: At the foot of dolomite hills in the Steelpoort and Crocodile River valleys in Limpopo Province.

EUPHORBIA GRANDICORNIS **Goebel ex N.E. Br.** This distinctive species forms dense stands and thickets up to 2 m in height. It is best distinguished from *E. grandialata* by its much longer spines. The main stem is much reduced and does not project above ground level. It is very many branched with rebranching occurring. The branches are wavy wing-like and are green with radiating yellowish markings. The spine-shields are continuous with strong, long diverging spines up to 7 cm in length and small spines below the large. The inflorescence produces 1–3 yellow cyathia.

Euphorbia grandialata in habitat near Penge in Limpopo Province showing the dense nature of this prolific species *Photo Alma Moller*



Distribution: This species occurs patchily from near Ubombo in N KwaZulu-Natal through Swaziland and into the E Kruger National Park N of the Olifants River and into the western adjacent regions of Mozambique.

EUPHORBIA GRANDIDENS **Haw.** This is a tall tree with a bare, whitish trunk with longitudinally disposed short, hard paired spines. The apex has erect to three-angled sub-erect stem-like branches with numerous side branchlets. Branches have paired spines often with accompanying prickles.

Distribution: *Euphorbia grandidens* is a widespread species, extending from Humansdorp in the E Cape to near Port Edward in S KwaZulu-Natal and patchily to near Golela in the N.

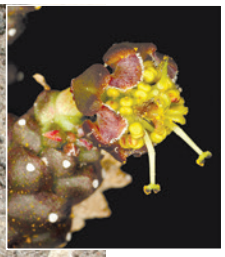
EUPHORBIA GRANITICOLA **Leach** This species is a small tree which forms a whitish trunk only in later life. It attains a height of about 2 m. The branches are 4—6 -angled and have conspicuous white margins with widely-divergent paired spines.

Distribution: Occurs in Manica Province around Chimoio (Vila Pery) in Mozambique, E of Mutare in Zimbabwe.

EUPHORBIA GREGARIA **Marloth** This euphorbia, reminiscent of *E, gariepina,* is a tall shrub which branches freely from the base and then rebranches freely. The grey-white to pale green branches are up to 3 cm thick, the dark-red leaves are rudimentary and soon deciduous. The unisexual, red-brown to dark red cyathia are borne at the apices of the stems in sub-globose cymes on very short peduncles. The fruit is born on a sharply recurved, downwards pointing pedicels.

Distribution: Inhabits the sandy plains, sometimes in large numbers, from the Great Karas Mountains in S Namibia to Aggeneys in Bushmanland. Also found in one locality on the Springbok Flats in the Richtersveld.





Alma Moller



Darrel Plowes



Darrel Plowes

1 & 2. ***Euphorbia gorgonis***
(1) A single specimen in habitat near Coega, in the E Cape.
(2) Two mature plants growing in habitat near to Coega. Note the buds and the few mature cyathia. Inset: a cyathium clearly displaying the side glands
3. ***Euphorbia*** **gregaria** in habitat at Augrabies, near Kakamas.
Inset: the fruits showing the characteristic sharply-bent pedicels
4 & 5. ***Euphorbia grandicornis***
(4) in habitat in SW Mpumalanga.
(5) Close-up of a flowering branch
6. ***Euphorbia grandidens*** in habitat in the Eastern Cape
7. ***Euphorbia graniticola*** in habitat near Chimoio, W Mozambique. Inset: close-up of the stem-like branches



Alma Moller



Picture & inset Gerhard Beukes

Alma Moller





Picture & inset Darrel Plowes



***EUPHORBIA GRISEOLA* Pax** This fairly variable species branches very freely from the base from a much-reduced main stem which does not arise above ground level and is up to 1.5 m tall. The thin unsegmented branches are dark green and beautifully marked with yellow-green. The spine shields on the compressed angles are horny and continuous and are armed with paired short pungent spines. The inflorescence comprises a single cyme comprising 3 horizontally disposed cyathia and is produced from an eye just above the spine-pair. A characteristic of the cyathia is the ovary which is exserted on a 5 mm long recurved pedicel resulting in a long-pedicelled capsule.

Distribution: This attractive species is fairly widespread in its range, which is in the N and W Limpopo Province and southwards to S of Thabazimbi and into the adjacent Botswana around Lobatsi. It is also found NE of Harari in Mashonaland, near the village of Murewa. It favours rocky areas with deep well-drained soil.

***EUPHORBIA GROENEWALDII* R.A. Dyer** This is a spiny, dwarf succulent, growing to not more than 150 mm. Its main stem and roots comprises a thick subterranean tuberous body with 3–7 unsegmented three angled branches which are twisted with prominent tubercles armed with a pair of long, pungent teeth. These are produced on separated triangular shields. The colour is bluish-green which turns reddish-brown in winter. Three cyathia are vertically disposed on solitary pedunculate cymes. This is a vulnerable species due to its proximity to human development and consequent habitat destruction.

Distribution: Of very limited distribution, occurring on stony granitic hill slopes N of Polokwane.

***EUPHORBIA GUMMIFERA* Boiss.** This euphorbia is a large shrub, reaching up to 1.3 m, which branches from the base, these rebranch extensively. The rough-to-the-touch branches are up to 15 mm thick. The plant is notable for the brick-red to dark chocolate-red colour of the top parts of the branches. The margins of the soon-deciduous succulent leaves are recurved upwards. The cyathia are clustered at the apices with a number of male flowers and less female flowers together. The almost ovoid seed capsules are bright pink.

Distribution: The plants inhabit the very arid regions of the Richtersveld and Sperrgebiet on open sandy stretches and on rocky hillsides.

***EUPHORBIA HALIPEDICOLA* L.C. Leach** This relative of the large *E. cooperi* is usually seen as a medium-sized shrub but can grow into a large single-trunked tree with many radiating branches. The stems are highly decorative. They are leaf-like in appearance with wavy angles and a bright green colour. The spines are pungent and paired. The flowering eye produces up to 6 cymes each producing 3 laterally disposed cyathia which are yellow in colour occurring on the apical segment. The name is derived from the salty habitat from which is was first described, it is nevertheless easy in cultivation, fast-growing but only successfully propagated from seed.

Distribution This species occurs in the Chipinga district in SE Zimbabwe, across into adjacent Mozambique to close to the ocean, from the Save River mouth to some distance N.

***EUPHORBIA HALLII* R.A. Dyer** This is an unusual species which has a several finger-like swollen tubers growing from its rootstock. The greyish-green stem is tubercular and up to 45 cm tall. The young apical tubercles have thin, leaflike bracts. The cyathia is red, green and purple, making it conspicuous when in flower.

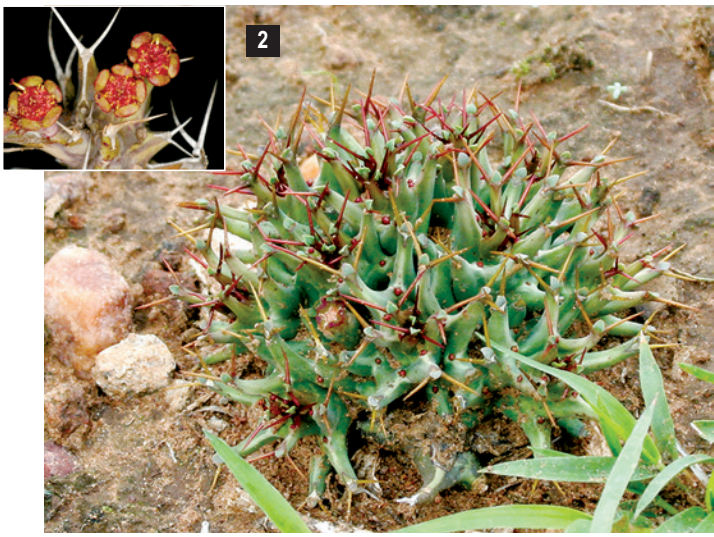
Distribution: Limited, occurring along the Doring River valley SW of Calvinia in the NW Cape.

***EUPHORBIA HAMATA* (Haw.) Sweet** This attractive, low-growing succulent grows up to 1.3 m tall and is usually broader than tall. The plant is spineless and forms compact clumps. The branches are somewhat contorted and have large conical tubercles. The leaves are sessile, fleshy and deciduous. The unisexual, red cyathia is solitary, nested in red (sometimes yellow) bracts.

Distribution: This is a common plant on rocky hillsides in the Richtersveld. It occurs in a wide range from Malmesbury in the SW Cape to as far N as Lüderitz.



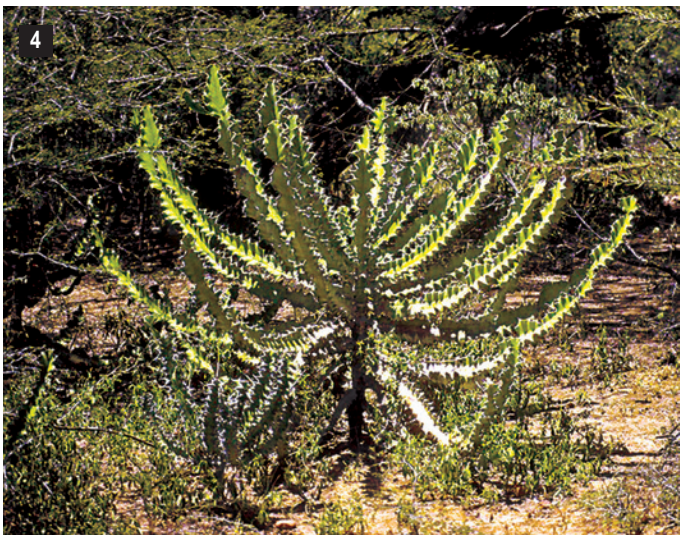
Alma Moller



Picture & inset Alma Moller



Gerhard Beukes. Inset Alma Moller



Darrel Plowes

Robin Frandsen. Insets Gerhard Beukes







1. ***Euphorbia griseola*** in habitat at Mapungubwe National Park, N Limpopo Province
2. ***Euphorbia groenewaldii*** in habitat north of Polokwane, showing the very prominent tubercles and long spines. Inset: close up of the cyathia of this rare plant
3. ***Euphorbia gummifera*** near Jenkinskop, Richtersveld. Inset: the cyathia
4. ***Euphorbia halipedicola*** in habitat near the Save River, SE Zimbabwe
5. ***Euphorbia hamata*** A plant in full flower on the Helshoogte in the Richtersveld National Park. Note the attractive red bracts Inset close up of the red bracts enclosing the flowers a plant from Arrisdrif, E of Alexander Bay.
Inset yellow colour variation of a cyathium
6. ***Euphorbia hallii*** in habitat in the Botterkloof, SE of Nieuwoudtville

Alma Moller



Euphorbia herrei **White, Dyer & Sloane** This strange miniature, spineless euphorbia, which grows up to 14 cm tall, arises from a slender taproot with a thick main stem from which arises a number of irregular-sized, segmented, erect or decumbent branches. These rebranches give the impression of an irregular formless plant. The species is monoecious and the single, or up to 3, bisexual cyathia are produced from the apices of the branches.

Distribution: This rare species occurs from approx. 40 km E of Oranjemund near the Orange River on both sides of the River, extending along the river for approximately another 30–40 km.

Euphorbia horrida **Boiss.** This very robust large shrub branches from the base and forms irregular clumps of up to 1 m or more. Its erect, cylindric branches branch from the base and are up to 40 cm in diameter and up to 1 m high in var. *major*. The stems are <14 –angled, and are armed with one to as many as six spines (modified peduncles) from a flowering eye crowded along the margins. The leaves are soon deciduous. The green cyathia are solitary, arising beside the base of the main spines. Four varieties are recognised: var. *horrida*: This type variety grows to about 75 cm tall with branches up to 15 cm thick; var. *major* is the largest of the varieties. It grows in excess of 1 m. The stem colour is grey-green. The variety *noorsveldensis* is smaller and the branches narrower than the type variety. The colour is dull bluish-grey. This variety is always found in association with *E. horrida* var. *striata*, which is the most attractive and distinctive of the species. Their branches are white with dark grey stripes. The wavy edges of the ribs are very frequently present in this startling plant.

Distribution: The variety *horrida* is the most common and patchily widespread of the varieties, from near Jansenville in the E to Ladismith (Seweweekspoort) in the W. The variety *major* occurs only in a limited range on flat ground and low hills, NW of Willowmore. The variety *noorsveldensis* grows on rock flats in a small area N of Jansenville. The variety *striata* favours quartzite boulders on the tops of ridges usually on the hotter N faces in the N foothills of the Grootrivier and Wolwefontein mountains NE of Steytlerville.

Euphorbia hottentota **Marloth** This species grows up to about 2 m. The main stem is generally subterranean with erect to sub-erect stout stems. It is mainly 5–angled and heavily armed with short pungent thorns. The horny shields between the spines are continuous. The colour of the stems is green to yellow. The small green cyathia are usually arranged vertically in threes with the central cyathium being male and the adjacent cyathium are bisexual. Capsules are shiny red.

Distribution: Distribution is disjunct, with the main populations around the Orange River, particularly in the Richtersveld National Park. It is recorded near Lutzputz on the W edge of the Knersvlakte. It also occurs at Nakob, on the Namibian side of the SE border with South Africa.

Euphorbia hypogeae **Marloth** This is a true dwarf species which is produced from a stout stem and primary branches which are subterranean. The clavate to cylindrical secondary branches which are only up to about 5 cm in length are produced above ground from the apices of the primaries. The colour is palest green in the bright light to deeper green when shaded. The tubercles are conical and tend to curve downwards; the leaves are rudimentary and soon deciduous and are up to 4 mm long, longi-

Euphorbia horrida Left: in habitat in the southern Cape *Photo Judd Kirkel*
E. horrida* var. *noorsveldensis Right: In habitat north west of Jansenville *Photos Alma Moller.*







Alma Moller



Alma Moller. Inset Rikus van Feldhuizen

Robin Frandsen





Alma Moller

1. ***Euphorbia herrei*** Showing the irregular growth form of this rare species growing near the road to Bloeddrif, Richtersveld. Inset The fruiting female cyathium with an accompanying small male cyathium
2. ***Euphorbia hypogeae*** in habitat between Fraserburg and Beaufort West via Oukloof Pass. Inset: a cyathium
3. ***Euphorbia horrida var. major*** in habitat at Kruidfontein farm north west of Willowmore. Insets: Detail of the inflorescenses and the cyathium of the species
4 & 5. ***E. horrida* var. *striata*** (4) a beautiful specimen at Kleinpoort near Steytlerville growing in quartzite rocks in association with small specimen of *Aloe striata*. (5) In habitat
6. ***Euphorbia hottentota*** near Khubus, Richtersveld



Kuba Jilemicky

Picture & insets Alma Moller



tudinally folded with the margins touching. The greenish-purple cyathia are solitary with up to 7 produced on a long peduncle per branch.

Distribution: Occurs in the Great Karoo from the Nieuweveldberge N of Beaufort West across to Fraserburg.

EUPHORBIA INERMIS **Mill.** This unarmed medusoid euphorbia is closely related to *E. esculenta*. The swollen tuberculate stem is buried with only the apex above ground and the numerous decumbent branches, which bend upwards, form plants up to a maximum of 30 cm. The cyathia, like that of *E. esculenta,* has very white bracteoles which makes the plants very visible in its flowering season. The red seed capsules are very evident in the dull dry veld. Its short peduncles are sometimes persistent. It is nutritious to stock and wild herbivores.

Distribution: Occurs in the E Cape near the coast between Grahamstown and W of Port Elizabeth.

EUPHORBIA INGENS **E. Meyer ex Boiss.** This very widespread iconic species is a large bulky tree. It is not the tallest, but is by far the largest and most bulky in our region. It attains the height of about 10 m. The trunk branches and the branches rebranch until the tree becomes an obconic crown of erect or ascending thick 4 angled segmented dull green branches. The margins are shallowly tuberculate, with the spine shields not contiguous, with spines mostly absent or with small reduced pairs. Three or more cymes with three vertically disposed yellow cyathia are produced, the central is sessile, male and the second later developing laterals are bisexual with a short peduncle.

Distribution: This very widespread and massive species is a dominating feature in many places: it occurs coastally and inland from S of Durban in KwaZulu-Natal, northwards, including Swaziland Mozambique, and NW to beyond Rustenburg in the North West Province, into E and central Botswana, into most of Zimbabwe, but it occurs sparingly in the Zambezi basin and also occurs as far N as Kenya.

EUPHORBIA INORNATA **N.E. Br.** This is another 'gorgon's head' species with a central thick nearly globose tuberculate stem, with numerous nearly erect branches surrounding the apex. The stems are densely tuberculate with white leaf-scars, glabrous and without spines, although the dry flower peduncles are persistent. The leaves are soon deciduous. The greyish cyathia with woolly-white involucres are solitary and produced at the tips of the branches in cymes.

Distribution: Occurs from near Hopetown in the Great Karoo and northwards to the Kimberley district.

Euphorbia inornata Below: in habitat near Van Wyksvlei, E Bushmanland
Photo Judd Kirkel



EUPHORBIA JANSENVILLENSIS **Nel** This is a unisexual rhizomatous species with a small underground main stem which produces rhizomes and elongated branches which may produce numerous short-stalked branches from their apices and the rhizomes produce additional shoots from the ground. The yellow-green cyathia are solitary and are produced on a short peduncle in the angles just below the apex of the stem.

Distribution: This rare species occurs from near Jansenville in the W to Kleinpoort in the E.

EUPHORBIA JUGLANS **Compton** This species usually grows with part of its stem below ground, but the usually buried parts develop, under certain circumstances, above ground (see photo). It generally inhabits quartz-covered fields. It is an unisexual, spineless species with the main stem and much of its greyish-green branches underground. The bright green cyathium is usually solitary but is rarely accompanied by 1—3 lateral cyathia. The male plant's peduncle is 4—6 mm long and the female's is 2—3 mm long.



Judd Kirkel Welwitch

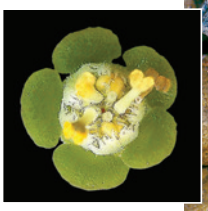


Gerhard Beukes



Robin Frandsen







Picture & inset Alma Moller

1. ***Euphorbia inermis*** in habitat near Jansenville, S Cape. Inset: detail of a branch-apex showing fruit and cyathia
2 & 3. ***Euphorbia ingens*** (3) in habitat in Mpumalanga (4) Close up of a fruited branch from a plant at Tugela Ferry, KwaZulu-Natal
4 & 5. ***Euphorbia jansenvillensis*** in habitat at Kleinpoort, near Steytlerville in the eastern Cape
6 & 7. ***Euphorbia juglans*** Two plants in habitat at Bloutoring in the western Little Karoo. Note the blue-black seedpods on the upper picture. Note the lower branch in the lower picture which clearly shows the basal section which would normally be subterranean in the preferred sandy habitat of the western Little Karoo quartz fields. Inset: The cyathium

Robin Frandsen



Robin Frandsen





Robin Frandsen

Distribution: Usually found in the Bokkeveld quartz fields of the W Little Karoo, but also in rocky outcrops in the region, N of the Kougasberge.

EUPHORBIA JUTTAE **Dinter** This weird little species grows to a mere 15 cm tall. Its branches from the base forming numerous spineless branches all facing northwards (in habitat). The little branches are articulated into short grey-blue to yellowish-brown sections. The inflorescence is solitary with bisexual tiny cyathia produced at the apex of the stems.

Distribution: An inhabitant of the dry pebbly plains of the desert of the northern Sperrgebiet SE of Tshaukaib to W of Aus in Namibia.

EUPHORBIA KAOKOENSIS **(White, Dyer & Sloane) Leach** This attractive very spiny dense plant, up to 1.3 m tall, has multiple basal and secondary branches. The thin branches are whitish-grey to grey-green in colour and the long pungent 3–4 spines are situated very close together. At the base of the branches the old spines are greyish-white to brown but at the flowering apex they are prominently rufous. The spine shields are discontinuous and the inflorescence consists of 3 horizontal yellow cyathia produced just above the spines.

Distribution: West of the Otjahipa Mountain in the Hartmannberge region of the Kaokoveld in N Namibia.

EUPHORBIA KNOBELII **Letty** *Euphorbia knobelii* is a spiny succulent shrub rarely grows taller than 1 m. It is a much-branched species with a very short main stem which is usually subterranean. The plant produces many segmented 5-angled branches which are green to lightish yellow-green, beautifully marked with contrasting yellow lines. Spines are paired with the spine shields separated. Three vertically disposed cyathia are produced on short peduncles. This is a vulnerable species due mainly to pressure from human development and its consequent habitat destruction.

Distribution: Occurs on a small range of hills in the Marico district of the North West Province, growing in sandstone rocks and shallow soils overlaying sandstone and quartzite.

EUPHORBIA LEISTNERI **R.H. Archer** This erect shrub is about 1 m tall, was thought to be *E. monteiroi* as its tubercled stems and tufted leaves resembled that species. It has few to many thickish branches borne near the apex of the trunk with tufts of obovate green leaves. It produces terminal cymes with yellow cyathia produced on a long peduncle.

Distribution: This is a very rare species found in the NW of Namibia in Kaokoland.

EUPHORBIA LIGNOSA **Marloth** This euphorbia is a dwarf many-branched shrub growing up to 65 cm. It branches from the base, which is a stout central stem, into many forked sharp-pointed, horny branches forming a hemi-spherical clump. Small leaves are produced near the apices of the stems and 3–4 cyathia are produced from short peduncles at the apex of the stem. The capsules are often deep red, sometimes green.



Euphorbia leistneri showing the plant in habitat at Epupa Falls, NW Namibia *Photo Alma Moller*

Distribution: Recorded from Tschuakaib, SW of Haalenberg in Namibia, southwards in the Sperrgebiet narrowly across the Orange River in the N Richtersveld and across to the Great Karas Mountains.

EUPHORBIA LIMPOPOANA **Leach & S. Carter** This is a spiny shrub which is densely branched from the base, growing up to 50 cm tall. The branches are thin, acutely 4—angled with brown to greyish spine shields. Paired spines are long, and robust. Flowers are concentrated along the upper parts of the branches and are bright yellow

.

Distribution: Concentrated along the Limpopo River from Mozambique to Botswana. Also in Mpumalanga and Zimbabwe.



Alma Moller



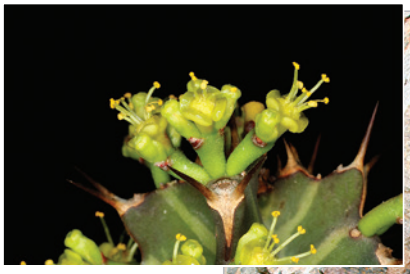
Alma Moller



Alma Moller



Alma Moller



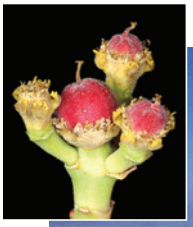


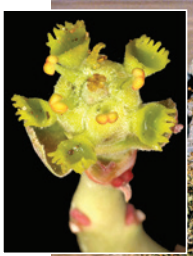
1 & 2. ***Euphorbia juttae*** (1) in habitat 57 kms on the Aus road to Rosh Pinah, S Namibia.
(2) In cultivation
3 & 4. ***Euphorbia kaokoensis*** (5) showing the plant in habitat at Epupa Falls, NW Namibia.
(6) Showing the flowering branch-tips
5. ***Euphorbia knobelii*** In habitat at Mokgale Village near Zeerust. Inset: showing the three contiguous cyathia
6 & 7. ***Euphorbia limpopoana*** in habitat between Tshipise and Pafuri.
Close up of a flowering branch showing the cyathia and discontinuous spine shields with divergent twin spines and prickles
8. *Euphorbia lignosa* in habitat at Garub, about 20km west of Aus, Namibia.
Insets: Showing the attractive pale-green involucre bracts and the reddened immature fruits, which turn brown, characteristic of this species

Picture & inset Alma Moller



Alma Moller





Gerhard Beukes. Insets: Alma Moller



Alma Moller

EUPHORBIA LORICATA **Lam.** Somewhat similar to *E. multifolia* this beautiful species branches freely at the base and also upwards. It is a woody shrub, up to about 1 m tall, with the stems slightly tuberculate and spiral with long grey to reddish-brown spines which are modified peduncles. The green leaves are long, narrow and more or less linear, with obtuse endings. The cyathia are borne on long reddish-brown peduncles and are green.

Distribution: Occurs in the Olifants River valley, around Clanwilliam and into the Cedarberg.

EUPHORBIA LOUWII **Leach** This is a spiny succulent growing up to 1 m which branches freely from the base. It also rebranches sparingly from higher up the branches. The colour is bluish-green to yellowish-green dependent of exposure to the sun. Between the angles there is a zigzag longitudinal bluish band and the spine shields are discontinuous and are armed with up to 5 slender needle-like spines. The inflorescence comprises 3 vertically disposed yellow cyathia developed from a single eye on the upper parts of the stem.

Distribution: Occurs in a few isolated and localised places in the northern outliers of the Waterberg in Limpopo Province..

EUPHORBIA LYDENBURGENSIS **Schweikerdt & Letty** This species is a shrub growing in excess of 1.5 m, but usually about 60 cm. It has a reduced main stem from which many branches are produced, which in turn rebranch near the apices. It forms 4 angled stems. The spine-shields form a usually continuous horny edge with divergent horizontal spines. The cymes are solitary and sessile with horizontally disposed 3 yellow cyathia, with the central cyathium being male and developing first and the 2 outer being bisexual. These are produced on the upper parts of the branches and rebranches, mainly from the joint of the branch and rebranch

.

Distribution: Occurs in the Steelpoort Valley about 50 km N of Mashishing (Lydenburg) and also near Branddraai, N of Ohrigstad.

EUPHORBIA MAMMILLARIS **L.** This is a unisexual species, many branched, rarely re-branching, branching from near the base of the main tessellately-tuberculate stem. Forming large clumps of somewhat elongated ovoid branches with some persistent recurved thorns, the remains of sterile peduncles. These seem to be in parallel bands around the stems. The solitary cyathia are dull-purple to green and are produced in clusters from between the axils at apex of the stems. This work does not accept the incorporation of this species into *E. polygona*.

Distribution: Occurs in the Little Karoo from Willowmore, across to Oudtshoorn and southwards to the SW parts of the region.

Alma Moller



Priscilla Burgoyne SANBI



EUPHORBIA MAURITANICA **Marloth** This is a very common dwarf to large spineless shrub, up to 1.5 m tall with numerous thin yellowish-green to green branches and rebranches which are covered with black leaf-scars arising from a thick rootstock. The inflorescence is terminal umbels of 3 to several yellow female cyathia surrounding as single male yellow cyathium (sometimes absent).

Distribution: Common and widespread. It occurs throughout the S Namibia, W Cape, E Cape through to KwaZulu-Natal.

EUPHORBIA MELANOHYDRATA **Nel** This untidy euphorbia has a clump of stems each of which have multiple very short branches which cover the plant. These are covered with tubercles each with a white-tipped leaf-scar. In good years the plant is covered with deciduous leaves up to 1 cm long, which are clustered towards the branch-tips. The inflorescence comprises cymes at the branch-tips with 2–3 sessile or pedunclate cyathia with dark-green involucre glands. (*Illustration on P. 283*)



Priscilla Burgoyne SANBI



Alma Moller



Alma Moller

Niels Jacobsen



Judd Kirkel Welwitch



1. ***Euphorbia loricata*** in habitat near Clanwilliam
2 & 3. ***Euphorbia louwii*** in habitat near Marken, W Limpopo Province. with close up of flowering branches
4 - 6. ***Euphorbia mammillaris*** (4) in habitat near De Hoop, Oudtshoorn district
(5) In habitat near Uitenhage. (6) In habitat near Oudtshoorn
7. ***Euphorbia lydenburgensis*** in habitat near Branddraai
8 - 10. ***Euphorbia mauritanica*** (8) in habitat near Khubus, Richtersveld. (9 in habitat at Stinkfontein, Richtersveld. (10) Fruiting cyathia.
Euphorbia melanohydrata (Illustration on P. 283)



Gerhard Beukes

Gerhard Beukes





Distribution: *Euphorbia melanohydrata is c*onfined to sandy places from Beauvallon eastwards towards the Richtersveld mountains and N across the Orange River and also E of the Aurusberg, W of Lutzputz in Namibia.

EUPHORBIA MELOFORMIS **Aiton** This popular euphorbia is unisexual growing up about 10 cm tall. It is solitary or sometimes branching at the base. The persistent hardened peduncles, particularly in the male plant, are characteristic. It has 8 or more prominent angles and is usually beautifully marked with transverse purple brown, dark green and lighter green bands. The plant is spineless but the margins of the lobes generally have a few to many dichotomous or simple dried persistent hard peduncles. The somewhat depressed apex usually has a thickish cluster of dichotomous or simple dried peduncles. The male cyathia is in erect persistent cymes of up to 12, which are up to 6 mm long and forking once or twice near the apex, produced from the centre of the depression. The female cyathium is deciduous and on a much shorter pedicel. The furcate cyathium is small and green in colour.

Distribution: This species is known from near the Zwartkops River near Uitenhage, across near Grahamstown.

EUPHORBIA MICRANTHA **Boiss.** This is a dwarf species, up to about 30 cm in diameter, with the main stem being a continuation of the thick tuberous root, which is subterranean with only the apex exposed. The branches are procumbent and rarely sub-erect. These are normally 4 angled but sometimes less. It is glabrous green and unmarked. The angles are slightly tuberculate and these are armed with divergent paired spines. The cymes are solitary from each flowering eye at the apical part of the stems, each cyme consists of 3 horizontally disposed reddish cyathia, with the central cyathium sessile and the others with a short peduncle are produced later.

Distribution: Occurs from the Bathurst district, northwards to Fort Beaufort and across to Cradock in the E Cape.

EUPHORBIA MONTEIROI **Hook.f.** This is a widespread species. It forms a stout many-tubercled, sometimes branched trunk, crowned with long, linear leaves in a short peduncle. The inflorescence consists of long peduncled pedicels in cymes. Two leaf-like bracts are produced with the single, usually bisexual, cyathium in their centre. This is a well-known popular euphorbia and is an attractive plant. Two subspecies are recognised, subsp. *monteiroi* and subsp. *brandbergensis*. This subspecies is an enormous plant, reaching a height of up to 3 m. The dried peduncles of this subspecies are more persistent than the nominate subspecies giving the plant a much 'shaggier' appearance.

Distribution: This is a widespread plant, occurring over the whole length of Namibia, into E and NW Botswana, into the NW Cape and also as far E as Lydenburg in Mpumalanga.

EUPHORBIA MULTICEPS **Berger** This is a spiny, conical-shaped solitary plant which very rarely branches at the base. The thick, fleshy stem is completely covered with short, almost globose, clavate-cylindric tuberculate branches, longer at the base and shorter towards the apex. The spines are modified sterile peduncles, longer when produced from the stem and shorter on the branches. The greenish-yellow cyathia are solitary, from the tips of the branches.

Distribution: occurs from S of Pofadder, westwards to near Springbok and in S in a band across through Vanrhynsdorp and south to the Little Karoo, where it is found in the W. It is common between Sutherland and the Ceres Karoo.



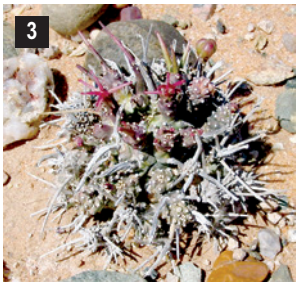
Euphorbia micrantha in habitat S Cradock, on the road to Mortimer
Photo Alma Moller. Inset: the cyathium.



Robin Frandsen



Alma Moller. Inset Rikus van Feldhuizen

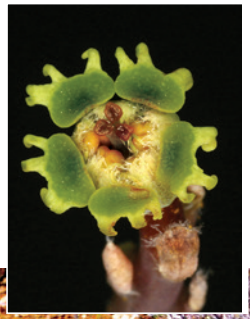


Rikus van Feldhuizen



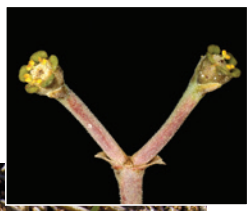
Alma Moller

1 - 3. ***Euphorbia melanohydrata*** (1) in habitat in deep sand east of Beauvallon near the Orange River, east of Alexander Bay. (2) Close-up of the cyathia, which are quite yellow in this specimen from Witputs Farm, near Rosh Pinah, Namibia. (3) A small specimen from W of Beauvallon. Inset: The green involucres of the cyathium are prominent
3 & 4. ***Euphorbia meloformis*** (3) A male plant in habitat at Coega.
(4) A female plant in habitat near Grahamstown. Inset: The forked cyathia
5. ***Euphorbia monteiroi*** a young plant photographed at Lerm Farm, near Waterberg in Limpopo. Inset: the fertile cyathia is shown with its leaf-like bracts
6. ***Euphorbia multiceps*** in habitat SW of Sutherland
Inset: the cyathium





Alma Moller



Robin Frandsen. Insert Alma Moller



Priscilla Burgoyne SANBI



Niels Jacobsen



Euphorbia multifolia **White, Dyer & Sloane** This is a spiny, dwarf species with the main stem covered with crowded branches up to 15 cm in length. It is closely related to *E. eustacei* which occurs some 65 km away, near Matjiesfontein, Laingsburg. The branches rebranch forming a crowded cushion. The stems are densely tuberculate and are densely covered with persistent long peduncles. The leaves are narrow, tapering towards the base and obtuse at the tips. The cyathia is simple, greenish-yellow and borne on a long peduncle, which persists.

Distribution: Occurs on rocky slopes, NW of Ladismith in the Little Karoo, in the general direction of Laingsburg.

Euphorbia multiramosa **Nel** This is a dwarf succulent shrub with the main stem up to 20 cm tall and up to 15 cm thick. It has a single main stem with numerous prominently tuberculate re-branching branches. The stem has numerous thick tapering peduncles, emerging and projecting beyond the branches, giving the plant an untidy appearance. The cyathia are produced in cymes of up to 3 bisexual flowers, produced on the short, protected young branches, low down on the leeward aspect of the plant. The cyathia are yellow.

Distribution: Occurs on sandy plains from S of Vioolsdrif to near Jakkalswater and along the coast near Alexander Bay.

Euphorbia namibensis **Marloth** This dwarf euphorbia grows up to about 20 cm tall. The main stem is globose to subglobose and produces many spreading branches which either cover the plant or are concentrated towards the top, with the bottom of the tuber denuded by harsh dry winds in more exposed desert areas. The tuberculate branches are up to 6 cm long with the tips producing long, up to 3 cm, narrow, folded, soon deciduous lanceolate leaves. The inflorescence is a solitary bisexual cyathium, with dark green involucre glands, produced in clusters on the branch tips.

Distribution: A Namibian endemic, recorded from Tschaukaib near to and SW of the Haalenberg mountains W of Lüderitz, eastward to Aus and S to Rosh Pinah.

Euphorbia nesemannii **R.A. Dyer** is a very variable spiny many-branched unisexual euphorbia, growing up to in excess of 40 cm in height. It has a short main root which is almost entirely subterranean and is combined with the root. The erect to sub-erect branches are clustered and are up to and in excess of 40 cm and up to 14 angled. The solitary spines along the angles are modified peduncles. The cyathia are almost always solitary, rarely in cymes of 3 and are longer on the male plant than on the female plant.

Distribution: Occurs in the Robertson Karoo from Robertson in the S to Worcester in the N.

Euphorbia obesa **Hook.f.** Possibly one of the most popular succulents in cultivation, although it is almost extinct in the wild. Four-footed herbivores have a particular fondness for the plant, as have two-legged 'omnivores', and both have contributed to the extreme rarity of the plant in habitat. The almost cactus-like plant generally grows to a height of approx. 20 cm in height and about 10 cm in diameter. It is neat, sub-globose, without any spines, has



Euphorbia multiramosa in habitat in deep sand in the eastern Richtersveld, north of Steinkopf
Photo Robin Frandsen



Euphorbia nesemannii in habitat in the Ouberg Pass, Montagu
Photo Alma Moller



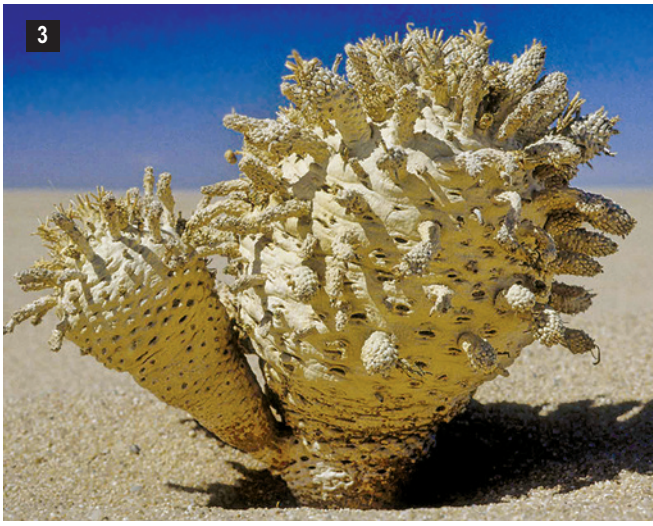
Kuba Jilemicky



Judd Kirkel Welwitch



Gerhard Beukes



Gerhard Beukes

1. ***Euphorbia multifolia*** in habitat S of Trentjiesrivier, nr Prince Albert.
Inset: close-up of the cyathia
2 & 3. ***Euphorbia namibensis***
(2) a specimen in habitat at Garub, near Aus, in very exposed desert conditions
(3) Showing the stem whitened by the harsh sand-blasting of the desert winds. In habitat at Zebrafontein, Rosh Pinah, Namibia.
4, **5 & 6**. ***Euphorbia obesa*** (5) in cultivation, showing the plant in flower
(4 & 6) In habitat, the plant with seedpods (6), at Charlwood, S of Graaff-Reinet.
7. ***E. obesa* subsp. *symmetrica*** in habitat., W of Willowmore



Kuba Jilemicky



Judd Kirkel Welwitch

Robin Frandsen



Robin Frandsen



tiny vestigial leaves along the normally 8–, but sometimes 7– up to 11–segmented sections. The leaf remains give the appearance of a straight beaded shallow ridge. The colour is palest reddish-white and it is laterally striated. The flowers (cyathia) are borne at the apex from round flowering eyes in the centre of the ridges. The plant is dioecious. The subspecies *symmetrica* differs in its being flatter and also in the shape of its flowering eyes.

Distribution: Of limited distribution in a small region, around Charlwood, between Graaff-Reinet and Kendrew in the Central Karoo, S Cape; the subspecies '*symmetrica*' occurs NW of Willowmore near Rietbron and near Beaufort West.

EUPHORBIA ORNITHOPUS **Jacq.** The 'bird's foot' euphorbia is a spineless, dwarf species which, excluding the inflorescence, is barely 7.5 cm tall. The main stem is a continuation of the rootstock and jointly forms a turnip-shape. It forms many rhizomes underground and branches freely above. The newly emerged branches are sub-cylindric to sub-globose, procumbent or straggling rebranched. Leaves are small, lanceolate and soon deciduous. The cyathium is solitary or in cymes of up to 5. The 'bird's foot' cyathia are greenish-yellow.

Distribution: Recorded about 20 km SE of Grahamstown and S of Cradock at Halsowen about 10 km S of the town.

EUPHORBIA PENTAGONA **Haw.** Usually forms large bushes of over 2 m tall. Sometimes old plants form small trees with a thick woody trunk. Although the name means five-angled, the plant often has up to 7, occasionally 9. The branches are bright green and the spines yellowish-lime.

Distribution: Occurs in Valley Bushveld from Grahamstown to beyond Uniondale in the W.

EUPHORBIA PENTOPS **White, Dyer & Sloane** This is a rare dwarf, growing up to about 25 cm. It is usually solitary but does produce additional stems. The stout, obconical stems are covered with numerous heavily tuberculate somewhat clavate branches with linear, deciduous leaves up to 2 cm long. The inflorescence is attractively arranged in a neat rosette around the apices of the branches; the glands are ciliate and coloured from green to red.

Distribution: This rare species is confined to a limited range between Kommagas and Steinkopf.

EUPHORBIA PERANGUSTA **R.A. Dyer** This is a rare euphorbia which is a spiny, succulent shrub, growing up to 1 m high. It develops numerous branches which flower at the apices. The spiny 5–7-angled branches, which are beautifully marked with light green bands radiating from the centre, are produced from a very short subterranean stem. Spines are paired along a horny margin. Shields, from which the spines arise, form a continuous horny edge along the margins. Cymes are on the terminal segments of each flowering branch with up to 3 cyathia vertically disposed. This rare species is closely related to *E. knobelii*. Human development pressure and predation by small mammals, such as porcupines, has led to the endangered status of this species.

Distribution: Confined to a few southern aspect rocky slopes in the Marico district of North West Province.

EUPHORBIA PILLANSII **N.E. Br.** This species is closely related to *E. stellaspina*, but differs in its smaller habit, its interesting markings and lesser number of angles to the branches and stouter simple, but occasionally forked, spines. It grows up to 30 cm tall, branching at the base and above. The stem and branches are stout with the angles more prominent towards the apex. The sides are horizontally banded with pale and darker green. The pale and dark green cyathia arise from the apex of the branches. They are usually solitary but sometimes branching into up to six.

Euphorbia pentagona A young plant in habitat on the Ecca Pass near Grahamstown, clearly showing the characteristic bright-green stems and yellowish-lime spines *Photo Alma Moller.*



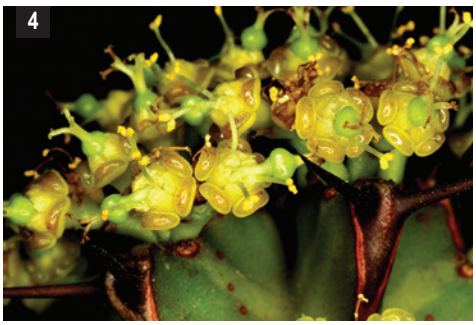


Alma Moller





Alma Moller



Alma Moller

Robin Frandsen



1. ***Euphorbia ornithopus*** A double-headed specimen in habitat. Inset: A fruiting cyathium
2. ***Euphorbia pentops*** in habitat N of Steinkopf at Umdaus. Inset: The cyathium
3 & 4. ***Euphorbia perangusta*** (3) in habitat near Zeerust in the Marico District. Showing the red fruited branch apices.
(4) Detail of a branch apex showing the fruiting yellow cyathia
5. ***Euphorbia pillansii*** in habitat north of Garcia Pass, southern Little Karoo, in close association with *Gibbaeum heathii*

Alma Moller

Distribution: Occurs in the central Little Karoo from Ladismith southwards towards the Langeberge and also in the southern Ceres Karoo.

EUPHORBIA POLYCEPHALA **Marloth** In the wild this multi-headed species somewhat resembles a mat of the dwarf *E. globosa.* as it forms dense low mats of plant heads which resemble that species. This spineless species has its innumerable branches produced from a large underground tuber, or tubers. These many closely-packed branches form an extensive flat mass of slightly convex heads, which is hardly above ground level or a massive cushion-shaped mound. The whitish to brown cyathia are solitary or in cymes of up to 3 at the apex of the branches.

Distribution: Recorded from S and SW of Cradock, to W of Pearston and N of Somerset East.

EUPHORBIA POLYGONA **Haw.** This is a spectacular unisexual species, sometimes forming dense colonies of plants which reach up to nearly 2 m in height. The plant is spiny and sometimes without spines. It forms clumps of branches of unequal length. The branches are up to 10 cm thick and are formed from suckering at the base and they rarely rebranch. They develop 12—20 acute angles which are slightly wavy. The spines are modified peduncles and 2—3, rarely up to 7 from a flowering eye — more robust and numerous in the male plant. The dark purplish-red cyathia are solitary from each flowering eye, on one or each side of a spine near the apex of older branches.

Distribution: Occurs on stony hillsides from near Albany, S of Grahamstown, to Ladismith in the Little Karoo.

EUPHORBIA PSEUDOCACTUS **Berger** This is a spiny plant which forms very large stands, being the dominant plant in many areas in its range. The main stem is reduced and rarely appears above ground. It produces many erect to sub-erect branches which are up to about 1 m in height and not often rebranching. The dark or light green stems have V—shaped markings radiating from the grooves. They are usually 4 angled but sometimes 5 angled. The spine shields are united into a continuous hard and horny edge to the angles and are armed with sharp paired spines on the tubercles. There are 1—3 peduncled cymes from each flowering eye each with 3 vertically disposed yellow cyathia; the central one male and the two outer are bisexual.

Distribution: Recorded only from the Muden Valley in central KwaZulu-Natal.

EUPHORBIA PSEUDOGLOBOSA **Marloth** This is a unisexual species which is similar in appearance to *E. globosa* except when in flower when the difference becomes apparent. The main stem is underground from which the apex produces a mat of compact sub-globose smooth, green bodies. The solitary green cyathia are produced several together from the apex of the stems.

Distribution: Occurs from the Riversdale region to W of Montagu in the S Cape.

EUPHORBIA PUBIGLANS **N.E. Br.** This is an attractive sprawling species which has long, freely-branching cylindrical stems which branch along their length. The stems grow up to 30 cm and are covered with dense, crowded tubercles. The flower peduncles are long and persistent. The glabrous leaves are long and linear with the margins folded inwardly. The cyathia are solitary, palest yellow and are borne on long, up to 6 cm, peduncles.

Distribution: Occurs in the S Cape from W of Port Elizabeth to Knysna.

Euphorbia pseudoglobosa in habitat south of Witsand in the Swellendam district
Photo Robin Frandsen







Priscilla Burgoyne SANBI. Inset Alma Moller

1. ***Euphorbia polycephela*** in habitat on the Cranmere farm, near Pearston in the E Cape, also showing the fruiting cyathium
2 & 3. ***Euphorbia polygona*** (2) in habitat (3) In habitat on the Riebeeck East, on the road to Alicedale. Inset: the conspicuous blood-red cyathium
4. ***Euphorbia pseudocactus*** in habitat E of Weenen, KwaZulu-Natal
5. ***Euphorbia pubiglans*** in habitat on the Prince Alfred Pass, NE of Plettenberg Bay



Alma Moller



Alma Moller

Org Fritz

Alma Moller





***Euphorbia pugniformis* Boiss.** This dwarf medusoid euphorbia, which is up to 15 cm in diameter, produces a large central sub-globose stem in old age which is partly subterranean. It develops 2 to 3 series of heavily tuberculate somewhat tapering branches. The leaves are soon deciduous. The yellow solitary cyathia are produced thickly on the apex of the stem or less frequently on the basal part and apical part of the branches.

Distribution: *Euphorbia pugniformis* occurs from the region of Kingwilliamstown to Mossel Bay in the S Cape.

***Euphorbia pulvinata* Marloth** This remarkable unisexual plant produces large to massive mats which creep over and cover parts of the rocks in its preferred habitat, or produces large cushion-like clumps, where sometimes several separate plants aggregate into a single mass cluster. The many branches are produced from a single stem and thereafter ramify outwards. Branches are spiny with sharp modified peduncles, up to 12 mm long. The branches are fairly short and globose at first, then elongating and becoming cylindric. The sessile cyathia are purplish-red and sometimes yellowish-green.

Distribution: This species is very widely spread, in suitable habitat from S of the Soutpansberg, through to Lydenburg and Ermelo, then S through central KwaZulu-Natal, Lesotho and the E Free State and as far S to the Cradock—Queenstown district in the E Cape.

***Euphorbia ramiglans* N.E. Br.** This medusoid euphorbia forms large clumps of up to 35 cm in diameter. It consists of a central stem with many tightly-packed branches which are green in colour. The yellow cyathia are produced on a long peduncle. The plant is named for the branched glans of the cyathia. It is evident from the picture that the glandular involucre is much branched.

***Distribution*:** This rare euphorbia is an inhabitant of the deep sands of the NW Cape along the coastal stretch between Port Nolloth and Alexander Bay.

Euphorbia restituta N.E. Br. This attractive shrub grows to 25 cm or more. It produces a few to several branches from a main stem. The stem and branches have prominent, more or less spirally produced, downward pointing tubercles. The plant is spineless but with persistent remains of the inflorescence peduncles. The leaves are short-lived and deciduous on long peduncles. The inflorescence is produced on a long persistent pedicels arising in the axils from the top of the stem and branches. Several flowers arise from the apex of the pedicel.

Distribution: This species occurs in the NW Cape from the region of Groen River and Garies in the S, northwards to the Richtersveld.

***Euphorbia rowlandii* R.A. Dyer** This succulent shrub is up to 2 m tall with branches radiating from a very short stem. Branches are 5–7–angled and very rarely rebranch. Angles are acute and armed with paired spines on a continuous horny shield. The inflorescence comprises of three cyathia which are vertically disposed. This species is similar to *E. confinalis* which however grows into a tree. This species is vulnerable due to several pressures.

Distribution: Found on gentle to steep westerly or south westerly slopes in the N Kruger Park, adjacent Venda region and in a restricted area in S Zimbabwe.

***Euphorbia rudis* R.A. Dyer** This is a dwarf succulent, up to 25 cm tall and 35 cm in diameter. The central, main stem is mostly subterranean. It produces numerous crowded side thickish cylindrical, tuberculate branches up to 15 cm long. The soon deciduous leaves are produced in rosettes at the branch apices. The bisexual, green-coloured cyathia are solitary or in small cymes at the apices of the branches. The involucre glands are cup-shaped. This species is similar to *E. braunsii*.

Euphorbia rudis in habitat NE of Steinkopf in deep sand
Photo Robin Frandsen





Alma Moller

1. ***Euphorbia pugniformis*** A young plant in habitat before the production of a large and robust central stem. Note the cyathia on the central stem as well as the branches. Inset showing the cyathia in various stages of development
2. ***Euphorbia pulvinata*** The plant in habitat, showing its ability to spread over and cover large rocks. Inset: a close-up of the apical-flowering branches
3 & 4. ***Euphorbia ramiglans*** (3) in deep sand W of Alexander Bay. (4) in the Red Lichen (*Telochistes capensis*) beds E of Alexander Bay
5. ***Euphorbia*** **restituta** A beautiful specimen in habitat clearly showing the persistent apical peduncles from which the inflorescences were produced, as well as some flowering peduncles.
6. ***Euphorbia rowlandii*** The plant in habitat at Mutale Village, Venda. Inset: a stem apex showing the cyathia

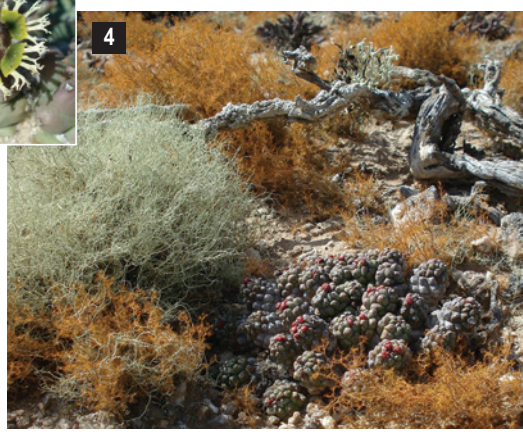
Darrel Plowes. Inset Gerhard Beukes



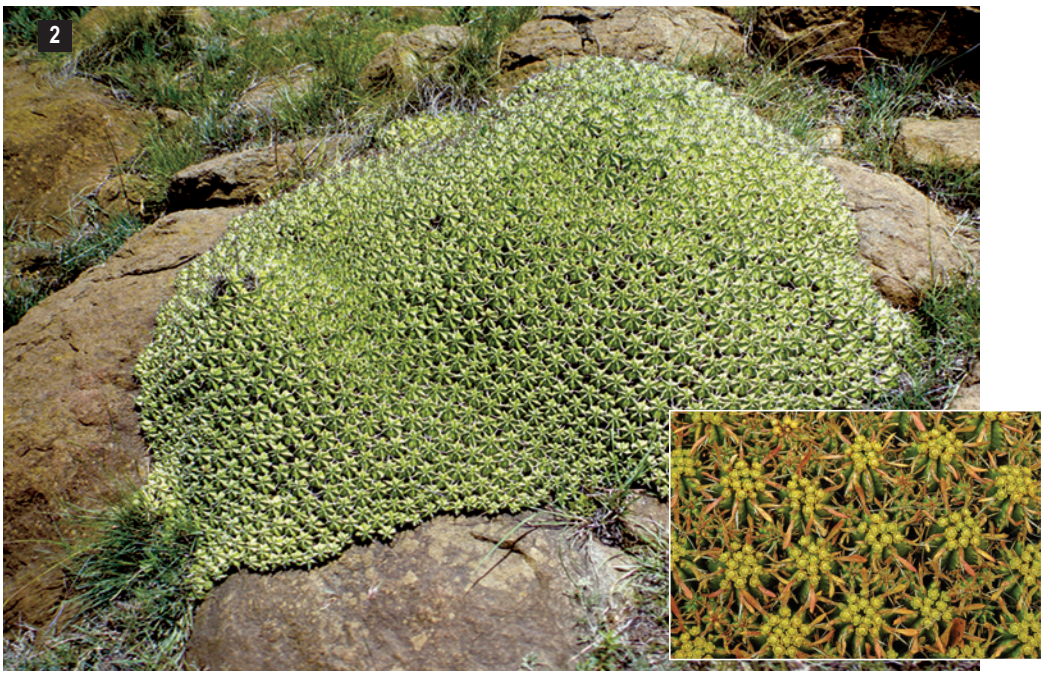
Alma Moller



Picture & insert Judd Kikel Welwitch



Judd Kirkel Welwitch





Alma Moller

Distribution: Found in fairly dense colonies N of Steinkopf, also in Namibia E of Bethanie.

EUPHORBIA RUGOSIFLORA **Leach** This is a densely branched, spiny species with rhizomatous erect greyish-green stems, which are about 0.5 m tall and forming clumps of about 1 m in diameter. The segmented branches are 3—4 angled, becoming 5 angled with age. The angles are prominently tuberculate with long, divergent, paired spines on a continuous, horny margin. The cymes are solitary with vertically disposed dark red foul-smelling bisexual cyathia.

Distribution: This rare species is known only from 'The Corner' near to Mozambique, in the extreme N of the Chimanimani National Park on the E bank of the Muhohowa River in E Zimbabwe.

EUPHORBIA SCHINZII **Pax** This species extends extensively underground through a combined root and stem from which many rhizomes extend to erupt periodically into erect and sub-erect thin, prickly 4—angled branches, which are up to 17 cm long. The spines are paired and divergent. New spines at the apices are red, turning grey as they age. A single yellow cyathium is produced at the flowering eye along the branches.

Distribution: Occurs from Mashishing (Lydenburg) across to Rustenburg and northwards including the Waterberg, Polokwane (Pietersburg), the Soutpansberg and widely in the S parts of Zimbabwe and in the extreme E parts of Botswana.

EUPHORBIA SCHOENLANDII Pax This striking plant is very similar to *E. fasciculata*, with which it was originally confused. It is however more robust than that species. It grows up to about, but rarely in excess of, 1.2 m, is usually single-stemmed but branches occasionally. The stems and branches are covered with spirally disposed prominent hexagonal tubercles. The cyathia is solitary or produced in cymes of threes.

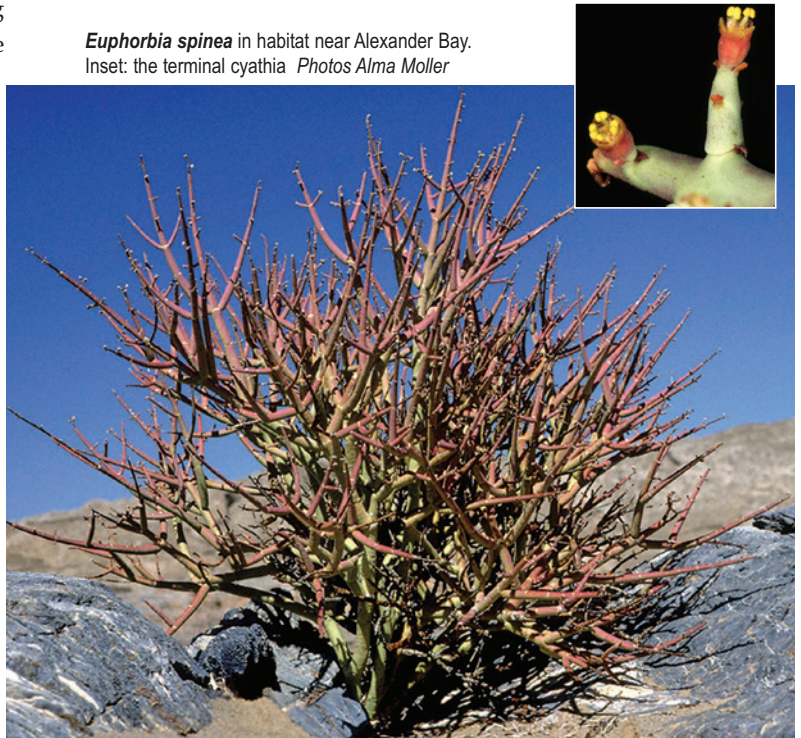
Distribution: This interesting species is found from the district of Clanwilliam in the S, to W of Vanrhynsdorp in the NW Cape.

EUPHORBIA SEKUKUNIENSIS **R.A. Dyer** This is a small tree euphorbia, reaching up to 7 m tall. The trunk has about 8 vertical bands which represent obsolete spine shields. The trunk is usually simple but occasionally produces 1 or a few side branch-like stems low down. The branches form a spreading and ascending flowering crown. The branches are up to 5 angled. The angles have a continuous horny shield with slightly raised tubercles tipped with paired, divergent, pungent spines. The flowering eye produces a solitary cyme which consists of 3 horizontally-disposed yellow cyathia; the central cyathium is sessile and male and the two outer are bisexual on a short peduncle.

Distribution: Occurs in the general area around Burgersfort, N of Roossenekal in the ravines and rocky sloping areas of the Steelpoort Valley in Sekukuniland.

EUPHORBIA SPINEA **N.E. Br.** This is a dioceous sharp-pointed, untidy, much-branched plant. The branches arise out of a tuberous base. The plant grows up to 70 cm high. The leaves are scale-like, blackish-purple, sessile, rudimentary and are soon deciduous. The develop along the upper parts of the stems at almost right-angles to the stem. They are sessile, unisexual, producing 1–2 to a cyme. The capsules are produced on a recurved pedicel.

Distribution: Found in the arid regions of E Richtersveld, northwards to Haalenberg, east of Lüderitz in Namibia..



Euphorbia spinea in habitat near Alexander Bay. Inset: the terminal cyathia *Photos Alma Moller*



Darrel Plowes

1. ***Euphorbia rugosiflora*** in habitat in NE Zimbabwe
2 & 3. ***Euphorbia schinzii*** in habitat in S of Pretoria. Inset: detail of a part of a flowering branch
4 & 5. ***Euphorbia schoenlandii*** (4) In habitat at Aties, 50km west of Vanrhynsdorp with the well-known Gifberg mountain in the background (5) In habitat. A pair of young plants clearly showing the very robust persistent peduncles and prominent tubercles. Note the cavities above the apices of the tubercles from which the peduncles arise. This characteristic is found in *E. fasciculata* and in no other species Inset: a cyathium
6. ***Euphorbia sekukuniensis*** in habitat at De Hoop, in central Mpumalanga



Judd Kirkel Welwitch



Tim Peatling. Inset Judd Kirkel Welwitch





Judd Kirkel Welwitch. (3) Darrel Plowes

Gerhard Beukes





***Euphorbia squarrosa* Haw.** This attractive dwarf species has an oblong tuberous thickened root with an almost subterranean main stem which is a continuation of the root. The numerous sub-erect to erect radiating branches are up to 15 cm long, 3–5 angled and straight to contorted, they are glabrous and dark-green. The angles are armed with paired sharp spines. The solitary cymes with up to 3 transversely disposed striking red and yellow cyathia are produced on or towards the apex of the stem. The central cyathium is male and the other two are bisexual.

Distribution: Confined to the SE Cape between Bathurst, Grahamstown, Fort Beaufort and Kingwilliamstown.

***Euphorbia stapelioides* Boiss.** This is a dwarf species which ramifies underground and produces short finger-like branches above ground. The fibrous stems do not break easily. The inflorescence comprises 2—4 uni-sexual cyathia, which are coloured from red to green.

Distribution: This species favours sandy rocky soil from W central Richtersveld, northwards to the Orange River.

***Euphorbia stellata* Willdenow** This is a spiny, dwarf species, the stems of which are a continuation of a thickened main root, jointly forming a large subterranean tuberous body. The radiating branches form a tuft which are decum-bent and flattened to form only 2 spine-bearing angles. The divergent spines are paired at the apex of tubercles along the angles. The branches are glabrous, dark green or purplish-green, with an attractive feather-like radiating whitish-green marking. The yellow to green cyathia are solitary from each of the flowering eyes along the branches. Sometimes 3 horizontal cyathia are produced with the central one being male, which is soon deciduous and the two outer female being persistent.

Distribution: Occurs from the Albany district across to SW of Kleinpoort in the E Cape.

***Euphorbia stellispina* Haw.** This is a popularly cultivated, very striking unisexual succulent up to 50 cm tall. It branches freely from the base to form large to very large clumps of thick-stemmed solitary many-angled branches. The branch colour is deep green becoming brown with age. The many angles are heavily armed with pungent stellate spines which are modified fertile peduncles. The yellow cyathia are solitary, arising in clusters from the apices of the stems. Probably more correctly spelled '*stellaespina*'.

Distribution: Initially described from 'near Springbok' it occurs near Murraysburg, across to Hope Town and southwards through Beaufort West, between Victoria West to Laingsburg and across to Willowmore.

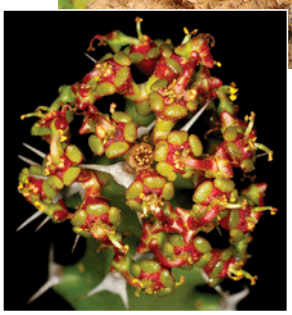
***Euphorbia susannae* Marloth** This is an attractive unisexual very tuberculate species which consists of a single main stem with a long tap root. In nature it tends to show only the apex of its convex green stem with much remaining below ground, from which, in later life, it produces many side branches. The greenish-yellow cyathia of the male plant are solitary or in cymes of 2 produced on peduncles arising from between the axils of the tubercles and crowded at the apex of the stem and branches.

Euphorbia susannae The plant in habitat at Springfontein in the S Little Karoo. The upper photo has the plant in association with *Trichodiadema densum*
Photos Robin Frandsen

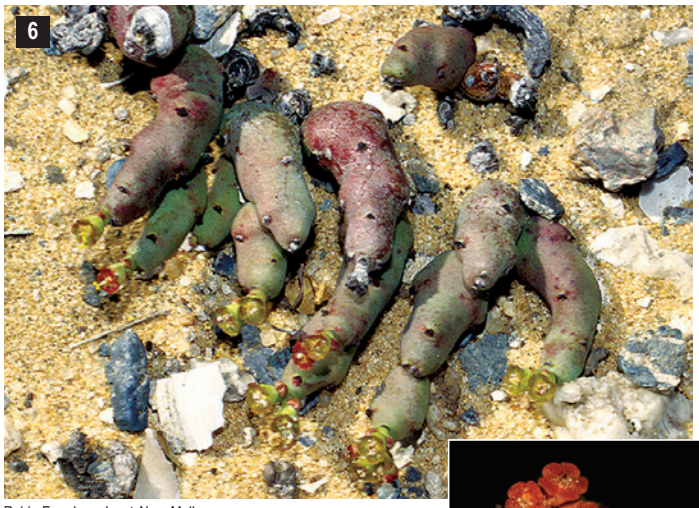








Picture & inset Alma Moller



Robin Frandsen. Inset Alma Moller



1. ***Euphorbia squarrosa*** in habitat in the Ecca Pass, near Grahamstown. Inset: close-up of the flowering stem.
2 & 3. ***Euphorbia stellispina*** (2) a plant in habitat N of Laingsburg. (3) At Koup Station, W of Laingsburg, clearly displaying the stellate spines.
4 & 5. ***Euphorbia stellata*** (4) the plant in habitat near Coega, Inset: two cyathia
(5) The plant in habitat at the Springbokvlakte in association with *Lithops terricolor*, S of Kleinpoort. This is a dwarf form of the species
6. ***Euphorbia stapelioides*** the plant in habitat at Kortdoring near Alexander Bay, Inset: Showing the small cyathia

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

Robin Frandsen



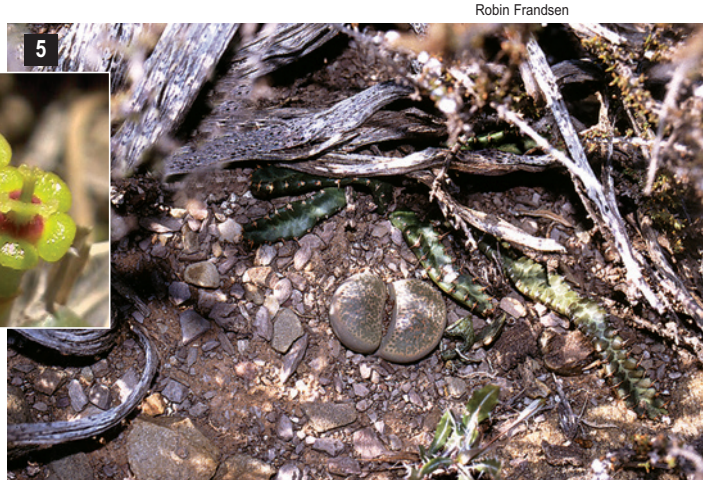
Robin Frandsen

Priscilla Burgoyne SANBI





Robin Frandsen



Distribution: This unmistakable species occurs from W of Lemoenshoek and eastwards to Springfontein in the S Little Karoo near the Langeberge.

EUPHORBIA TETRAGONA **Haw.** This is a spiny tree euphorbia, which reaches a height of about 13 m. The bare trunk is obscurely 6—8 angled and usually single with several stem-like branches arising from near its base. The stem and stem-like branches each have a short and broad crown of laterally produced and recurving branches. These secondary branches are 4—5, sometimes 3 angled, light green, with the angles slightly tubercled with paired spines at their apex. The spine shields are separate. The solitary cymes are produced from flowering eyes between the spines. They are horizontally disposed with 3 green cyathia, the central is male and the laterals are bisexual.

Distribution: This species favours valley slopes from Uitenhage, westward to the Bathurst region and northwards along the coast to the Kei River in the former Transkei.

EUPHORBIA TORTIRAMA **R.A. Dyer** This is a small, spiny species which develops from a carrot-shaped, tuberous body which is mainly subterranean. It forms clumps of up to 50 twisted stems which, unlike its close relative *E. groene-waldii*, the branches constricts into segments with age. The tubercles are prom-inent with long paired spines, up to 60 mm long, at the apex, which are produced on a continuous spine shield. The cymes are solitary from each flowering eye and are 3— vertically disposed yellow cyathia.



Distribution: This is a widespread species, occurring in an area NW and N of the Waterberg and S of Polokwane (Pietersburg) in Limpopo Province and shortly into adjacent Botswana.

Euphorbia tortirama
in cultivation
Photos Judd Kirkel Welwitch



EUPHORBIA TRIANGULARIS **Desfontaines** This is a large spiny tree growing as large as 18 m tall. The stout trunk is obscurely 4 angled. Branching may occur low down on the trunk but are usually higher up the trunk. Some trees are much-branched, with segmented branches up to 2 m in length. These are green, 3—5 angled and wing-like. 2 or 3 peduncled yellow cymes develop from the flowering eye; each consisting of 3 vertically disposed cyathia. The 3-angled stem form occurs in the E Cape, which is probably where the name originates.

Distribution: This is the most common tree euphorbia in the E Cape, occurring often in large groups, it is found from KwaZulu-Natal to the E. Cape.

EUPHORBIA TRICHADENIA **Pax** This species has a large tuberous main root which is usually misshapen, with a long elongated narrower underground stem. The 1—few branches ramify into up to 5 branches which are puberulous to glabrous. The long sessile opposite and glabrous green leaves are lanceolate. The inflorescence is solitary in the forks of the branches or sometime 3—5 in small terminal cymes.

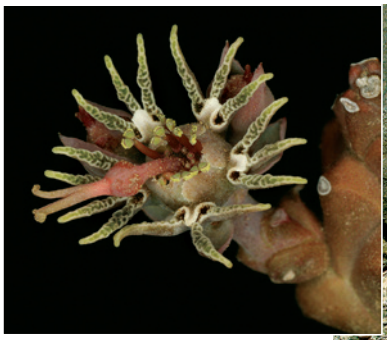
Distribution: Occurs across the Limpopo Province and southwards to near Pilanesberg and across to Mbombela (Nelspruit) in Mpumalanga. Then southwards to Hlabisa in N KwaZulu-Natal. It is common and widespread in Zimbabwe, especially in the Kyle National Park.

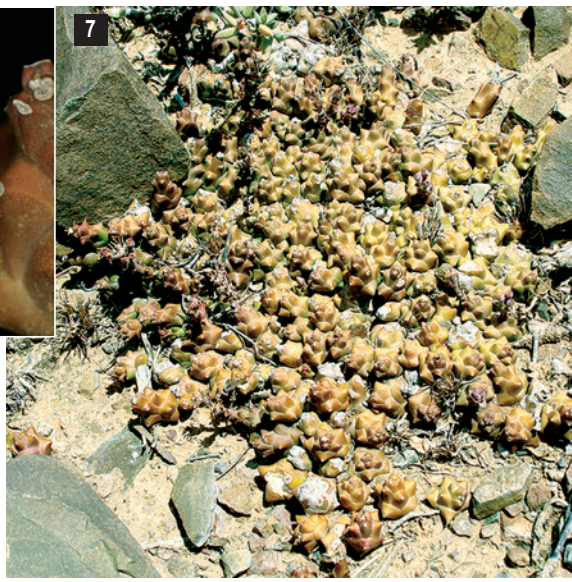
EUPHORBIA TRIDENTATA **Lam.** This dwarf rhizatomous species is similar to *E. globosa* and *E. ornithopus*. The rhizomes are produced from a subterranean main stem, which is a continuation of the main root, and they send up small groups of compact globular heads, which are tessellate and glabrous green, where as many as 10 such groups, constituting a single plant, are frequently found.

Distribution: Is recorded from the Cradock district across to the N and NE of Grahamstown.



Alma Moller





Picture & inset Alma Moller



Alma Moller



Judd Kirkel Welwitch

Alma Moller



1 & 2. ***Euphorbia tetragona*** (1) in habitat at Cookhouse, E of Somerset East. (2) Close-up of a young plant
3 & 4. ***Euphorbia triangularis*** (3) in habitat in the E Cape. (4) Close-up of the fruited branches
5 & 6. ***Euphorbia trichadenia*** in habitat near Thabazimbi, North West Province
7. ***Euphorbia tridentata*** in habitat just S of Cradock. Inset: the cyathium

Judd Kirkel Welwitch



Alma Moller



***Euphorbia tuberculata* Jacq.** This striking euphorbia grows up to about 80 cm tall. It comprises a stout central stem, either wholly or partially subterranean. It produces many heavily tuberculated spiral, green, with erect or decumbent spineless branches, but which has persistent dried remains of the peduncles. The branches are thickened at the apex and produce umbels of attractive simple cyathia, each on a peduncle of up to 2 cm in length.

Distribution: It occurs along the W coast of the Cape from as far S as Saldanha Bay and Malmesbury to N of Vanrhynsdorp.

***Euphorbia umfoloziensis* Peckover** This is a dwarf species with the root and main stem forming a large tuberous body. the stem is often branched and is produced laterally to form multiple heads. The heads produce branches, up to 20, which are straight constricted bluish-green to yellowish, with lighter markings The paired hard spines are produced along a continuous or discontinuous spine-shield. The single yellow cyathium is produced above the paired spine.

Distribution: The species has been recorded from the White imFolozi River valley near Dingaanstad and near Ulundi in KwaZulu-Natal.

***Euphorbia valida* N.E. Br.** This is the largest of the sub-globose euphorbias, which is sometimes quite elongated, sometimes twisted and sometimes regular. This usually solitary unisexual plant grows in excess of 30 cm tall in habitat. It is spineless but has few to very many hardened persistent robust forked peduncles which are concentrated on the upper third of the plant. The body-colour is green to grey with the angles between the ridges beautifully transversely banded. The lower parts become corky with age. The apex, especially in older plants, is covered with a tangle of hard, dry persistent peduncles and is not quite as depressed as with *E. meloformis*. The cyathia cluster is formed on a long peduncle with the cyathia greenish-yellow.

Distribution: This giant of the sub-globose euphorbias favours flat ground. It occurs between Jansenville in the W across to S and NW of Grahamstown and northwards to Somerset East.

***Euphorbia venenata* Marloth** This is a tall species, up to about 2 m, with erect segmented branches which arise from a subterranean stem. The branches are green to greenish-yellow. The branches rarely rebranch. The pungent spines are paired, about 5 mm long and stout. The cymes are 3 together and vertically disposed, with a sessile male cyathium in the centre and the 2 lateral cyathia being bisexual and borne on a short peduncle. The sap is probably not as virulent as the name suggests as the ripe seed pods are regularly grazed by baboons.

Distribution: Occurs on the Tsaris Mountains, W of Maltahöhe, near Auros and near Lake Otjikoto, just W of Tsumeb.



Euphorbia venenata in habitat near Lake Otjikoto, Tsumeb, N central Namibia
Photo Alma Moller

***Euphorbia verruculosa* N.E. Br.** This is another of the strange contorted miniature desert plants from SW Namibia growing up to 15 cm high. It is mainly decumbent with the primary branches up to 6 cm long and the secondary branches up to 10 mm long. The branches are heavily verrucose and grey in colour. The plant is dioecious and the yellow cyathia are very shortly pedunculate producing up to 3 in cymes at the tips of the branches.

Distribution: Known only from its type locality at Lüderitz, where it is found on the peninsula, growing among rocks.



Gerhard Beukes



Judd Kirkel Welwitch





Picture & inset Alma Moller



Judd Kirkel Welwitch

1 & 2. ***Euphorbia tuberculata*** (1) in habitat near Clanwilliam, SW Cape (2) An umbel of cyathia from the Richtersveld
3. ***Euphorbia umfoloziensis*** in cultivation
4 & 5. ***Euphorbia valida*** (4) a rare 5-headed plant in habitat at Kleinpoort (5) In habitat near Steytlerville. Inset: The cyathia & fruit
6. ***Euphorbia verruculosa*** The plant in habitat on the road to Griffiths Bay, Lüderitz, Namibia. Inset: close-up of the habit of this strange plant

Robin Frandsen



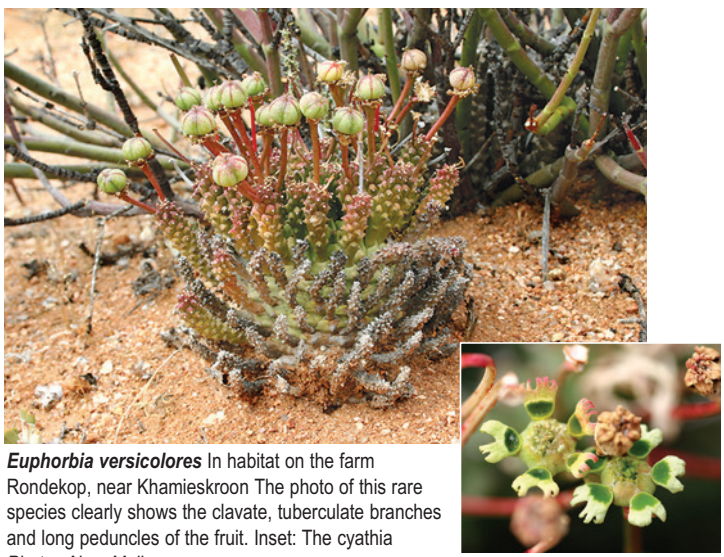


Picture & inset Alma Moller



Euphorbia versicolores **Williamson** This is a small and unusual euphorbia reaching in excess of 15 cm. The obconical stem is mainly subterranean and is with spreading branches which are up to 100 mm in length. The heavily tuberculated stems are club-shaped with heavy woody persistent tubercles up to 35 mm long. The inflorescence is solitary with loosely clustered, bisexual, cyathia on long pedicels. These are very variable in colour.

Distribution: This species was known only from a limited area around Eksteenfontein in the Richtersveld, occurring on stony plains but is now also recorded near Kamieskroon.



Euphorbia versicolores In habitat on the farm Rondekop, near Khamieskroon The photo of this rare species clearly shows the clavate, tuberculate branches and long peduncles of the fruit. Inset: The cyathia
Photos Alma Moller

Euphorbia virosa **Willd.** This very large species is notorious for its virulently poisonous sap, which has been used for poison arrow tipping. The stem is short, almost subterranean, with ascending branches which are often spiral and which can be in excess of 4 m and 2–4 m wide. Branches seem to rebranch from approximately half way to near the apex. The branches are generally 5–angled with the edges armed with short, pungent paired teeth. The horny margin is continuous and the solitary cymes have 3 yellow vertically disposed cyathia, with the central cyathium being male and the 2 outer bisexual. These are produced from the eye between the spines on the apical segment of the plant.

Distribution: This large species is found from N Richtersveld in South Africa to as far N as Angola.

Euphorbia wildii **L.C. Leach** Is a close relative of *E. monteiroi*. It is a spineless, heavily tuberculate shrub or small tree, with a thick central stem, which may grow in excess of 3 m. The greyish-green branches have a tuft of leaves at the apex. The cyathia, which are similar in appearance to *E. monteiroi,* are deep maroon to yellowish green to yellow.

Distribution: The plant is endemic to the N Great Dyke of Zimbabwe.

Euphorbia wilmaniae **Marloth** This is a spineless species which is largely subterranean in its growth and spreading up to 1 m or more, revealing itself only here and there, except where it is crowded by rock formations. the stem and root are wholly subterranean, which often divides into several tapering roots, producing many partly buried tubercled branches, which thicken into short, stubby clavate apices. The sessile cyathia are produced on the apex of the branch and are yellow.

Distribution: Occurs in a band across from near Boetsap in the North West Province across through the Postmasburg district and then also found near Lekkersing and Alexander Bay in the far W.

Euphorbia woodii N.E. Br. This medusoid euphorbia has a solitary main obconic stem which is almost subterranean. It produces up to 40 branches from the apical circumference of the main stem. The branches are rhomboidal tuberculate and are bright green. The yellow cyathia are solitary and are produced on the branches and also on the central branchless parts of the stem.
Distribution: From Durban in KwaZulu-Natal and southwards into the N coastal regions of the E Cape.

Org Fritz





Rolf Bekker



Robin Frandsen. Inset Gerhard Beukes



Darrel Plowes

1 & 2. ***Euphorbia virosa*** (1) in habitat with Prof. Alma Moller. A particularly massive plant growing in deep desert sand near Uis in W Namibia
Inset: the fruit and cyathia of a specimen from Ganab in Namibia
(2) In habitat on the eastern rim of the Fish River Canyon east of Aus in Namibia



Priscilla Burgoyne SANBI

Alma Moller

3. ***Euphorbia wildii*** in habitat
4. ***Euphorbia wilmaniae*** in habitat near Postmasburg, Northern Cape
5 - 8. ***Euphorbia woodii***
(5, 6 & 7) in habitat near the S coast of KwaZulu-Natal.
(8) In habitat near Eliot in the E Cape.
Inset: detail of the cyathia



Judd Kirkel Welwitch



Org Fritz



Org Fritz

***Euphorbia zoutpansbergensis* R.A. Dyer** This is a small and spiny tree which attains the height of about 5 m. The long trunk (or main stem) is crowned with innumerable branches which are produced laterally and curve upwards, becoming erect. The segmented branches are up to 1.5 m in length, between 5—7 angled (usually 6) and are usually unbranched, but may rebranch with age at the ends of the old branches. The wing-like angles are edged with a continuous horny margin armed with pungent paired spines which are up to 10 mm in length. The flowering eye has solitary or sometimes 2—3 cymes, with vertically disposed yellow cyathia. The central one is usually male and the two lateral cyathia are usually bisexual.

Distribution: Is known only from the central parts of the Soutpansberg range in Limpopo Province.

Monadenium Pax

This genus is closely related to *Euphorbia*. P.V. Bruyns has included it in *Euphorbia* but that transfer has not been accepted by this work. The genus has approximately 50 species. With the exception of the two species discussed here, all other are found N of the Zambezi River to as far N as Ethiopia.

***Monadenium lugardiae* N.E. Br.** The rounded stems of this species have a tessellated appearance. The leaves are produced at the apex of the flattish tubercles and have at their base small spine-like stipules which, like the leaves, are soon deciduous. The stems are then smooth. The fleshy leaves are in clusters near the stem's apices. These are obovate or spathulate and sub-erect. The pale-green cyathia are solitary in the uppermost leaf-axils.

Distribution: Northern and Eastern Botswana, SE Zimbabwe near Mutare, across the North West Province in South Africa down the E part of the country into KwaZulu-Natal southwards to Ubombo. Also found in the W parts of Mozambique, adjacent to South Africa.

***Monadenium schubei* (Pax) N.E. Br.** This attractive small spiny plant has branches up to 45 cm long. The stem is much reduced, the apex of which is at ground level. The tufted stems are green, cylindric, tessellate and very prominently tubercled set in spiraled rows each with apical prickle-like stout spines. The green leaves are fleshy with prominent veins with somewhat crenulate edges. The cymes are pedunculate with several produced at the apices of the branches, each with 3 cyathia, the central being male which develops first and the two lateral are bisexual. The cyathia are light greenish-white.

Distribution: Occurs in the NE region of Zimbabwe also around the Matopos in the SE.





Judd Kirkel Welwitch



Judd Kirkel Welwitch





Picture & inset Darrel Plowes

1 & 2. ***Euphorbia zoutpansbergensis***
(1) in habitat. (2) Close-up of a stem
3. ***Monadenium lugardiae*** in cultivation
in Mutare, Zimbabwe. Inset: The cyathia
4 & 5. ***Monadenium schubei*** in cultivation



Robin Frandsen

Robin Frandsen



MESEMBRYANTHEMACEAE Fenzl

This very large family of succulent plants, one of the greatest grouping in the succulent plant field, comprises some 120 genera and over 1600 species plus many additional subspecies and varieties. The inclusion of very many of the taxa is beyond the ambit of this publication as they are plants of little interest to collectors or gardeners. Having said this, however, the very showy floral display of a number of these weedy, sometimes flat-leaved, tufted, beaded-leaved, mat-forming, shrubby etc. mesembs, though uninteresting in their general single-specimen appearance, often make a marvellous display of massed flowers, particularly after good prior rains. They account for, in a large measure, together with geophytes and daisy-like ephemerals, the internationally famous Namaqualand floral wonderland, which attracts so many from over the world to view this spectacular display.

This section confines itself to the more collectable and interesting mesembs which form the acme of succulence. These are found in the groupings of which, the 'flowering stones', are the most important. Nevertheless, couched in the other mesemb groups, such as 'mat-forming', 'tufted', 'tooth-leaved', 'rough-leaved', tongue-leaved' etc. species, are a number of other fascinating and unusual mesembs which have also been included.

The propagation of mesembs, through their methods of seed dispersal, is of particular interest. The group's adaptation for desert-like conditions is interesting: many of the species' seed capsules open only when sufficiently wetted to discharge some of the seed into wet soil. They then close to await the next downpour and then repeat the process. Close-up photographs of some of the various seed capsules are shown opposite.

By far the largest concentration of mesembs is in the W and S Cape region and the concentration is mainly in more arid to virtually desert-like conditions. It could be said that the mesemb group could almost be classed as a southern African endemic, with some species of *Carpobrotus, Delosperma, Mesembryanthemum, Disphyma and Psilocaulon* having escaped the confines of this region and taken up residence elsewhere on the planet. Only the mesemb genus *Sarcozona* is not endemic to southern Africa. Several endemic *Carpobrotus* are found in Australia and Chile and *Disphyma* has two species endemic to New Zealand.

The name *Mesembryanthemum* is derived from *mesembria* = afternoon and *anthemum* = flowers, implying that the flowers open in the afternoon.

ACRODON N.E. Br.

The genus Acrodon comprises 4 species of which *A. bellidiflorus* is the best-known and is included here. They form low-growing compact clumps, rarely creeping. The leaves are recurved and triangular in cross-section. Flowers are showy. Their range is along the S Cape from Cape Town marginally into the Eastern Cape Province.

***ACRODON BELLIDIFLORUS* (L.) N.E. BR.** The leaves of this species is dark green and sharply-keeled. the keel margins are toothed. The plant forms compact mats. The flowers are showy, white with a purplish-red margin and central stripe. This is a particularly easy plant to cultivate. It occurs on gravelly soil and is found in the wetter S coastal region.

Distribution: Occurs from Hermanus to Oudtshoorn in the S Cape.

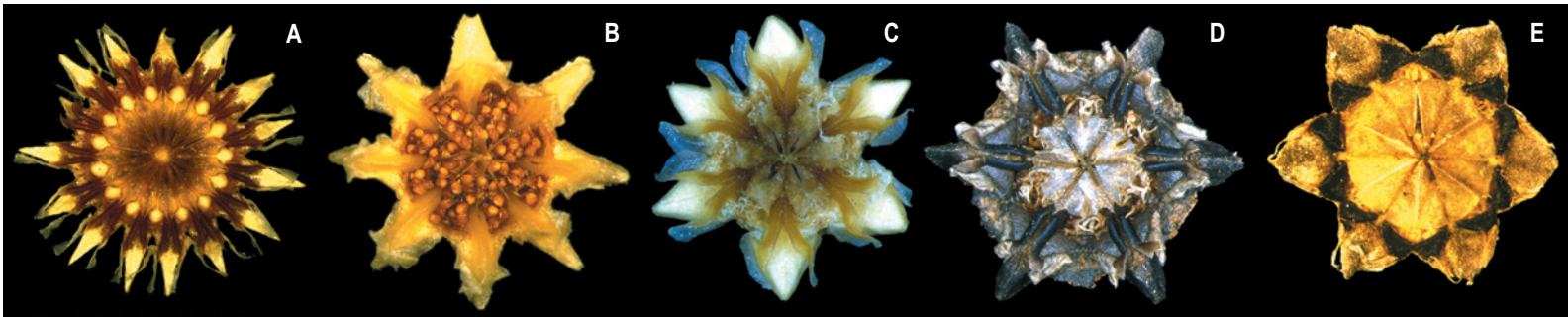
ALOINOPSIS Schwantes

This members of this attractive genus of tufted plants are favourites in collections. Their leaves are 2—3 to a branch, spathulate or rounded with truncated apices, with rough surfaces which are thick with calcium crystals in waxy warts or dots. There are 14 recorded species. The genus is probably due for revision, with the possibility of *A. orpenii* being excised from the genus and perhaps some of the taxa being reduced in status. The genus is distributed widely in the karooid areas of the Western Cape Province, the SW parts of the Northern Cape Province and the E portion of the Eastern Cape. *A. orpenii* is disjunct in distribution being found in the Prieska region. Cultivation is easy in greenhouse conditions. They need bright light, should receive sparing water during summer and very little in winter.

***ALOINOPSIS ACUTA* L Bolus** This tuberous species has somewhat spathulate and pointed leaves which are rough to the touch with small pale-green to red-brown tubercules. Flowers are yellow with red markings.

Distribution: This rare species occurs near Fraserburg in the Great Karoo.

***ALOINOPSIS LOGANII* L Bolus** This species has a tuberous fragile rootstock which develops near the surface. Rosettes are sometimes quite buried with only the leaf tips showing. Leaves are waxy, spathulate and truncate at the tips and are covered



Seed capsules of some of the mesemb species, showing the closing bodies, the membranes which cover the seeds in some cases and a closed capsule. It is an interesting exercise to dip a capsule in water and watch the opening process. When dry the capsule's closing bodies slowly re-close over the remaining seed.
A *Argyroderma* (showing the ring of tubercles. Seeds are obscured by a membrane), **B** *Muiria,* **C** *Gibbaeum,* **D** *Antegibbaeum,* **E** *Diplosoma* (closed capsule)
Photos Priscilla Burgoyne SANBI

Some mesembs in habitat













1: ***Argroderma subalbum***: from N of Lutzville. **2**: ***Pleiospilos compactus* subsp. *canus*** from near Prince Albert. **3**: ***Conophytum pellucidum*** from NE of Clanwilliam.
4: ***Lithops otzeneana*** from Brakfontein NW of Loeriesfontein. **5**: ***Tanquana prismatica*** in association with several plants of ***Didymaotus lapidiformis*** from S Ceres Karoo
6: ***Gibbaeum album*** in habitat at Springfontein, S Little Karoo *Photos Robin Frandsen*

John Trager



7. ***Acrodon bellidiflorus*** in cultivation
8. ***Aloinopsis acuta*** In habitat near Fraserburg
9 & 10. ***Aloinopsis loganii*** (9) in cultivation. (10) In habitat near Touws River

Dawie Human



Bob Chinnock



Judd Kirkel Welwitch



with pale, fine papillae. Flowers are yellow and very similar to *A. spathulata,* and may only be a smaller version of that plant.

Distribution: Found on shaly slopes near Matjiesfontein in the Great Karoo.

ALOINOPSIS LUCKHOFFII **(L Bolus) L Bolus** The rosettes are up about 4 cm wide with the leaves thick and wide at the base and broad and triangular at the apex, which is slightly recurved. Leaves are pale bluish-pink to greenish and are covered with regular coarse whitish tubercles; edges have 4—6 large pink tubercles. Flowers are pale yellow. The well-known *A. setifera* is conspecific with this species.

Distribution: N and NW of Loeriesfontein generally on lime-rich soils.

ALOINOPSIS MALHERBEI **(L Bolus) L Bolus** This species has a thick rootstock which broadens towards the top and produces several erect branches with spathulate keeled leaves. These are covered with erect prominent warts, especially along the apices extending over the lower surfaces and to a much lesser extent the upper surfaces of the leaves. The flowers are showy on a longish pedicel and are salmon to pink.

Distribution: Occurs on the plateau, between Calvinia and Loeriesfontein.

ALOINOPSIS ROSULATA **(Kensit) Schwantes** This is a small, often overlooked, species which forms small clumps of spathulate, somewhat triangular leaves. The leaves are heavily rugose and are wax-covered. Flowers are yellow with red striping. Somewhat similar to *A. rubrolineata.*

Aloinopsis rosulata in cultivation *Photo Bob Chinnock*



Distribution: Occurs between Willowmore and Steytlerville in the S Cape.

ALOINOPSIS RUBROLINEATA **(N.E. Br.) Schwantes** This thick-rooted clump-forming species has rough, somewhat triangular, widely recurved green, fleshy leaves, the tips of which tend to touch the ground. the rosettes are up to about 6 cm in diameter. The showy flowers are whitish to pale yellow with a red central nerve.

Distribution: Occurs from Graaff-Reinet in the Great Karoo southwards to Willowmore on silty flats or shaly soil.



Aloinopsis rubrolineata
in cultivation *Photo Bob Chinnock*

ALOINOPSIS SCHOONEESII **L. Bolus** This is the best-known of the species. It produces a thick rootstock producing several fragile stems. The leaf-bodies are compact, trigonally rounded and flattened on the inside with a marked chin, with the apex rounded-truncate and level with the surface of the soil. There are tanniniferous idioblasts with crystals on the epidermal surfaces which are without warts. Flowers are shiny, somewhat like silk.

Distribution: Occurs in the district of Willowmore to Steytlerville on silty flats.

ALOINOPSIS SPATHULATA **Schwantes** This species has a thick rootstock which widens towards the top. Plants produce one or more branches from the caudex. The rosette is up to about 50 cm in diameter. Leaves are erect to sub-erect, warty and flatish (spathulate), densely covered with papillae. Flowers are white to deep pink, paler outside.



Robin Frandsen



Bob Chinnock



Priscilla Burgoyne SANBI

1 - 3. ***Aloinopsis luckhoffii*** (1) in habitat N of Loeriesfontein. (2) In cultivation (3) Originally described as *A. villettii*, in cultivation
4. ***Aloinopsis malherbei*** in habitat near Loeriesfontein
5. ***Aloinopsis schooneesii*** in cultivation
6 - 8. ***Aloinopsis spathulata*** (6 & 7) in habitat on the Komsberg, N of Laingsburg. (8) In cultivation



Bob Chinnock



Bob Chinnock

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Bob Chinnock



Distribution: Occurs on shaly flats near Sutherland in the Northern Cape.

ANTEGIBBAEUM Schwantes ex C. Weber

This monotypic genus is an inhabitant of the Little Karoo. It lives in close association with plants of *Gibbaeum* and it has often been thought that it should fall under that genus. Investigation into the morphology of *Antegibbaeum* makes it very clear that it is not even closely related to *Gibbaeum*. In appearance it is closest to *Argyroderma fissum* but it too is not closely related to that species which occurs endemically in the Knersvlakte, hundreds of kilometres to the N of the Little Karoo, the home of *Antegibbaeum*. The flowers open at about noon and close at dusk.

ANTEGIBBAEUM FISSOIDES **Schwantes ex C. Weber** This species forms small clusters of deeply bifid leaves which are flat on the insides and loosely keeled on the outsides and blunt at the apices. The leaf-colour is pale whitish-green becoming reddish in the winter months. The large flowers are cerise to pink and are borne on short pedicels. The plants are usually found in association with *Gibbaeum* plants and usually, but not always, amongst quartz pebbles.

Distribution: Found in the W Little Karoo and also near Laingsburg in the Great Karoo.



Antegibbaeum fissoides in habitat in the W Little Karoo, N of the Warmwaterberg
Photo Robin Frandsen

ANTIMIMA N.E. Br.

This large genus was erected by N.E. Brown and has, in the past, been subsumed into several other genera. Dr Hartmann has since reinstated and revised the genus, resulting in a large number of species. Nearly all of these plants do not satisfy the requirements for inclusion in this work. Four species are included, being suitably interesting.

ANTIMIMA EVOLUTA **(N.E. Br.) H.E.K Hartmann** This is a species which forms with age large compact mats of small semi-globose to strongly-keeled heterophyllous leaf-pairs. One pair of leaves are markedly smooth with ciliate margins, which completely embraces the subsequent pair which is lightly papillate. The leaves are covered with a white sheath at resting time. The flowers are almost sessile and purple.

Distribution: Occurs in S Knersvlakte, N Cape.

ANTIMIMA IVORI **(N.E. Br.) H.E.K. Hartmann** This is a mat-forming species, up to about 10 cm in diameter. The single conical, very persistent' leaf-pair forms a smooth white sheath when dry. The waxy leaves are grey-green and papillate. The flowers are bright purple with the stamens white.

Distribution: Occurs in the Fraserburg, Sutherland districts where it favours in sandstone crevices.

ANTIMIMA LAWSONII **(L. Bolus) H.E.K. Hartmann** This remarkable species forms large mounds up to about 35 cm in diameter and up to 25 cm high. The plant bodies are hard with a sharpish point to the leaf-pair, making the mound tough and impenetrable. The leaves are greyish-green, triangular to triquetrous with translucent edges and keels. The flowers are deep pink.

Distribution: This species occurs well away from most plants of the genus in the Herbert, Postmasburg division in the N Cape.

ANTIMIMA PUMILA **(Fedde & Schuster) H.E.K Hartmann** This species forms densely packed semi-globose clumps of double-paired leaves. The one pair is smooth with papillate spreading tips, the second is enclosed in the sheath of the first, which opens in the rainy season into two almost oval spreading leaves, connate at the base and divergent at the tips. Flowers are rosy-pink with white bases.

Distribution: Occurs between Ceres in the SW Cape to Sutherland in the N Cape.



Ernst van Jaarsveld



Ernst van Jaarsveld



Priscilla Burgoyne SANBI

1 - 3. ***Antimima evoluta*** (1 & 2) in habitat
(3) in cultivation, a plant from the Knersvlakte
4. ***Antimima ivori*** in habitat near Sutherland in its resting stage
5 & 6. ***Antimima lawsonii*** in habitat near Campbell, N of Douglas, N Cape
7. ***Antimima pumila*** in habitat near Touws River



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch

Priscilla Burgoyne SANBI





Antimima pygmaea **(Haw.) H.E.K. Hartmann** This species has a compact centre from which it branches profusely. It forms flattish mats and with one leaf-pair connate for most of their length and the other for 1/2 to 2/3 of its length. The latter is sheathed in the former, breaking out at the first rains. Leaf tips are pointed and triangular, smooth but covered with a thin rugose cover of wax. Flowers are borne on a long pedicel.

Distribution: Occurs from near Worcester, W to Gamka in the Great Karoo.

Aptenia N.E. Br.

Aptenia is a weedy genus but is included as the species *A. cordifolia,* here represented, is very common in gardens everywhere. The plants are prostrate, decumbent or erect. The leaves are cordate, green and fleshy and the plants flower profusely.

Aptenia cordifolia **(L.f.) Schwantes** This species is common in cultivation and is used as a prostrate ground cover and on rockeries. It propagates freely from seed and cuttings and can become a problem plant. The flat heart-shaped leaves are fleshy and green. The flowers are pink, lighter inside.

Distribution: in habitat it probably originated only from the region around Kingwilliamstown extending to Port Shepstone in KwaZulu-Natal. It has been introduced far afield beyond S Africa.

Argyroderma N.E. Br.

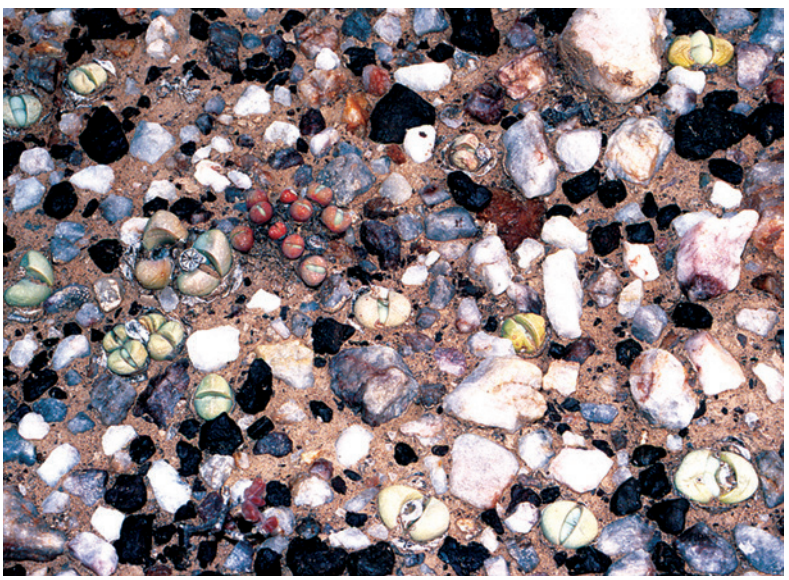
The genus *Argyroderma* is endemic to the Knersvlakte, occurring from S of Vanrhynsdorp to S of Kliprand. The plants are essentially dwellers in the quartz pebble fields. Their generic name is derived from the Latin: *Argyros* = silver and *derma* = skin, referring to the silvery colour of the epidermis of the plants. In the white quartz they are very cryptic and, especially in their dormant, shrivelled state, are very difficult to spot in the shiny quartz fields. With the exception of *A. fissum* the species are all rounded, somewhat egg-shaped, very succulent plants and unmistakably argyrodermas. The form of *A. fissum* is not unlike the unrelated Little Karoo species *Antegibbaeum fissoides*, with its slender, finger-like leaves. The showy flowers open by midday and close in the evening.

Argyroderma congregatum **L. Bolus** This species is solitary or forms tight globose clusters with age, consisting of up to 8 bodies and about 8 cm in diameter, each stem with a single leaf pair is fused at the base. The leaves are hood-shaped, grey to silvery-grey. The apices are obtuse, keeled to rounded. Flowers solitary, appearing during the autumn, yellow, sometimes cerise. They occur very abundantly on various types of soils and occur sympatrically with *A. crateriforme* and *A. fissum*. Plants flower April to May.

Distribution: The plants are common and widespread in the Vanrhynsdorp and Vredendal districts, occurring on quartz gravel in hilly terrain.

Argyroderma crateriforme **(L. Bolus) N.E. Brown** This species is branched or unbranched and semi-sunken in the ground. The leaves are glaucous-green, widely gaping and keeled. *A. crateriforme* is distinguished from its nearest relative, *A. delaetii*, in being much larger with the bodies well-dividing. *A. crateriforme* is the largest of the genus and a single leaf pair of a specimen of *A. crateriforme* from the northernmost part of its range measured about 70 mm at its widest point. Flowers are usually yellow, rarely white or purple. Plants flower April to May.

Distribution: It is one of the most widespread and common members of the genus, ranging from S of Vanrhynsdorp to the N border of the Knersvlakte near Nuwerus.



Argyroderma congregatum in association with *A. subalbum* in habitat N of Koekenaap, W Knersvlakte. *Photo Robin Frandsen*



Ernst van Jaarsveld



Ernst van Jaarsveld



Priscilla Burgoyne SANBI



Robin Frandsen

1 - 3. ***Antimima pygmaea***
(1 & 2) in habitat near Laingsburg. (3) in habitat near Touws River. The picture on the left (1) shows the plant in its resting stage
4 & 5. ***Argyroderma crateriforme***
(4) in habitat S of Vanrynsdorp
(5) in habitat S of Vanrynsdorp
6. ***Aptenia cordifolia*** in habitat near Gibralta near the mouth of the Great Fish River, E Cape

Ernst van Jaarsveld



Priscilla Burgoyne SANBI



Argyroderma delaetii **Maass** This is a variable species which is sometimes difficult to identify, but it is mostly single-headed and sunken into the ground. The leaves are glaucous, hood-shaped, slightly asymmetrical with the adaxial surface keeled, the keels are occasionally off-centre and are pressed together. Flowers are purple, yellow, white, rarely red.

Distribution: It is widely distributed from the S and N Knersvlakte to an occurrence north of Bitterfontein. It is confined strictly to quartz-covered hills and flats. A large population is seen in the central Knersvlakte near the Soutrivier bridge.

Argyroderma fissum **(Haw.) L. Bolus** This distinctive species, which is quite different in character from other members of its genus, divides to form dense clusters and can consist of more than 50 leaf pairs with visible internodes. The leaves are ascending, grey-green to bluish-green, tinged dark-pink to pink to red towards the apices and margin, linear to linear-triangular with an indistinct keel at the apex. Flowers are yellow, mauve or occasionally red.



Argyroderma fissum in habitat N of the Sout River, central Knersvlakte. Note the colour variation of the tips of the leaves.
Photos Robin Frandsen



Distribution: *A. fissum* is the most common and widespread of the genus, occurring from N of Klawer to N of Bitterfontein and further W, beyond the bounds of the Knersvlakte, nearer to the sea than other members of the group and as far S as the Olifants River. Although it occurs most often in the quartz patches. it has spread outside of these patches. Those plants found near the coast tend to be smaller than the plants in the Knersvlakte. The Holrivier plants with their deep red flowers and long slender leaves need mention as representing one of the most beautiful forms.

Argyroderma framesii **L. Bolus** Two varieties are recognised: var. *framesii* divides to form dense round clusters up to 6 cm in diameter, with many bodies. The leaves are hood-shaped, keeled, with an obtuse apex and flat on the upper surface, opening slightly during the growing season and when flowering. Flowers up to 17 mm in diameter, bright purple or purple and white, sometimes yellow and well raised above the bracts. The variety *hallii* forms large clumps but not as many as var. *framesii*. The leaves are triangular-ovate, spreading and gape more than var. *framesii*. Flowers are bright purple or purple and white (rarely yellow).

Distribution: Both varieties grow on the tops of hills and are locally abundant in the N Knersvlakte

Argyroderma patens **L. Bolus** Cluster-forming with age and is immediately distinguished from any other species by its broad, very widely spreading prominently keeled leaves and cluster-forming habit. It consisting of up to 10 bodies about 120 mm in diameter. Flowers are yellow, pink and various shades of purple or white.

Distribution: It has a restricted distribution in the N Knersvlakte. It grows on gently-sloping quartz gravel-covered hills.

Argyroderma pearsonii **(N.E. Br.) Schwantes** This species is solitary, but very rarely with up to five branches, and growing above ground level. The leaves are glaucous, semi-globose, without a keel, with the leaf pair forming a globose body with a narrow leaf-gap. Flowers are raised well above the leaves and are purple or rarely orange or yellow. With its neat round shape and raised flowers *A. pearsonii* is easily recognised. The plant is a handsome species and is popular in cultivation.



Ernst van Jaarsveld



Robin Frandsen



Priscilla Burgoyne SANBI

1 & 2. ***Argyroderma delaetii*** (1) in habitat showing the various colours within a single population. (2) An orange-coloured flower. Central Knersvlakte
3 & 4. ***Argyroderma pearsonii*** in habitat in the central Knersvlakte, N of the Sout River
5. ***Argyroderma framesii*** in habitat in the central Knersvlakte
6. ***A. framesii*** **var.** ***hallii*** in habitat in the central Knersvlakte
7. ***Argyroderma patens*** in habitat in the Knersvlakte



Priscilla Burgoyne SANBI



Ernst van Jaarsveld

Ernst van Jaarsveld





Distribution: This attractive species has a restricted distribution in the central Knersvlakte near the Soutrivier where it grows locally abundant among quartz pebbles on the top of and on the gentle slopes of hillocks. It is particularly abundant on the Kwaggaskop walking trail just N of the Soutrivier.

ARGYRODERMA SUBALBUM **(N.E. Br) N.E. Br.** This is a small-bodied species which divides to form dense grey-white semi-globose clusters of up to 25 heads. The leaves form semi-globose bodies and are pale glaucous. The old leaves are brown and persist over many years. The flowers are purple, sometimes purple and white, never yellow.

Distribution: This small species is restricted to the W extremity of the Knersvlakte, N of Lutzville. Together with *A. fissum* it is found in regions not dominated by quartz gravel flats. The soil is of a dark texture with, however, a few quartz and black pebbles scattered over the soil. It occurs on gentle slopes and the plants are not found in dense stands as with some of the other species.

ARGYRODERMA THEARTII **van Jaarsveld** This species is a dwarf, globose to semi-globose cluster-forming plant, producing 3—10 grey-green bodies. Leaves are divided by a fissure 1 mm wide at the top, slightly opening during winter and when flowering. Leaves are keeled at the apex occasionally with one leaf slightly larger than the other; leaf body obtuse to rounded but obtuse to truncate at the top when viewed laterally. Flowers are solitary and purple. It is distinguished from any other *Argyroderma* species by its cylindric oblong leaf pair, fused by half to two thirds of its length.

Distribution: It has a restricted distribution, confined to the N Knersvlakte, isolated from the major *Argyroderma* populations. It occurs in open hilly terrain dominated by extensive quartz-pebble flats. The plants are locally abundant in association with other succulents.

ARGYRODERMA TESTICULARE **Haw.** The plants of this species are sometimes solitary, but do divide to form clusters of up to 10 heads. The leaves are half-egg-shaped, keeled. The flowers are purple, rarely white and are sweetly-scented. *A. testiculare* is distinguished by its round orbicular body which divides to form small clusters. Its leaves are very obscurely keeled which distinguishes it from *A. pearsonii*, which is a larger, solitary species.

Distribution: It is restricted to quartz gravel flats and hillocks in the central Knersvlakte near the Sout Rivier where it is locally abundant.

BERGERANTHUS Schwantes

This Eastern Cape compact, stemless genus of plants, which become caespitose with age, consists of five species. They develop thick fleshy tap roots and thick horizontal rhizomes which further produce adventitious thickish perpendicular roots. The rhizomes die back from the centre, which then forms rings of plant-heads. The leaves are strongly triquetrous. Flowers are in well-developed cymes, with the fruit having big flat closing bodies. Two species are presented here.

BERGERANTHUS CONCAVUS **L Bolus** This species forms a compact cushion with triquetrous dark-green, recurving leaves with epidermal folds and dots. They are sharply-keeled on the back and characteristically end in a long awn. The flowers are lemon yellow and are borne on a long pedicel. The species *B. leightoniae* has been transferred to this species. Its leaves are toothed along the margins and the flowers are yellow sometimes with reddish tips.

Distribution: From around East London to NW of King-williamstown and NW into the previous Transkei region.

BERGERANTHUS MULTICEPS **(Salm-Dyck) Schwantes** This is a freely-suckering, caespitose species with solitary rosettes. It is the most beautiful of the genus. The spathulate leaves are acuminate with the upper surface flat and the lower obtuse, ending in an incurved awn. They are short and thick. Flowers are yellow on a long pedicel.

Distribution: Concentrated from Kirkwood to Port Elizabeth in the E Cape.

BIJLIA (Haw.) N.E. Br.

This clump-forming genus comprises two species: *dilitata* and *tugwelliae*. they are inhabitants of a limited region on the N side of the Swartberg Mountains, where rainfall is in the summer to early autumn. The rosettes are up to 12 cm or more in diameter. The flowers open around noon and close at dusk.



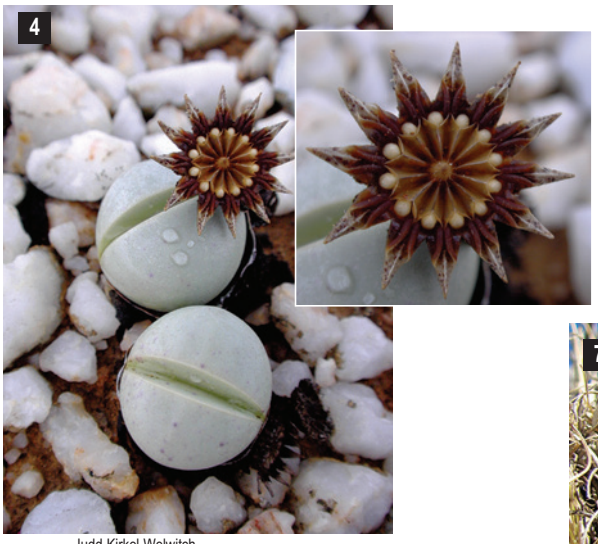
Robin Frandsen



Robin Frandsen



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch

1 - 3. ***Argyroderma subalbum*** (1 & 2) in habitat N of Koekenaap, W Knersvlakte. Note the disproportionally large seedpods (3) In habitat in the W Knersvlakte
4. ***Argyroderma theartii*** in habitat N Knersvlakte. Inset: close-up of the opened seed capsule
5 & 6. ***Argyroderma testiculare*** in habitat in the Knersvlakte
7 & 8. ***Bergeranthus concavus*** in habitat at Sada, S of Kingwilliamstown
9. ***Bergeranthus multiceps*** in habitat at Coega, E of Port Elizabeth. Inset a plant from Blue Cliffs W of Addo, E Cape

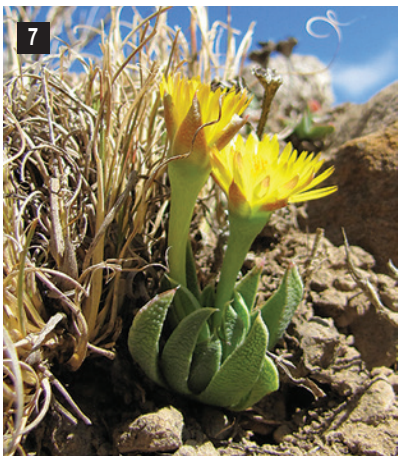


Ernst van Jaarsveld

Ernst van Jaarsveld



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

Priscilla Burgoyne SANBI



Niels Jacobsen. Inset Priscilla Burgoyne SANBI



Bijlia dilatata **H.E.K. Hartmann** This attractive mat-forming species forms small to large clumps. It was originally and popularly known by the illegitimate name *B. cana*. The leaves are broad, club-shaped and trigonous with the inside face concave. They are pale greyish-green tinged with yellow or red. The outside is strongly keeled. Leaf colours are yellowish-white. Flowers are almost sessile, bright yellow or orange-yellow and borne on a very short pedicel.

Distribution: *Bijlia dilatata* is found in a limited distribution W of Prince Albert. It is found adjacent to *B. tugwelliae* but the two do not seem to grow together.

Bijlia tugwelliae **(L. Bolus) S. A. Hammer** This interesting plant was previously classed under *Juttadinteria* and then reclassified as *Hereroa* but has finally found its way into *Bijlia*. The previously monotypic *B. dilatata* is rather dissimilar, though not entirely so, to this species and *B. tugwelliae* has now been transferred because of the short flower and fruit stalks and heavy layers of crystal in the outer layer of the epidermis walls of the leaves, which features are in common with *B. dilatata*. The plant forms large clumps of erect, falcate yellowish-green leaves. The flowers are yellow.

Distribution: Occurs in a small area S and E of Prince Albert.



Bijlia tugwelliae in habitat S of Prince Albert *Photo Bob Chinnock*

Braunsia Schwantes

The plants of this genus are usually low-growing shrublets or which have a creeping habit. The three-angled leaves are smooth with a waxy surface, or papillate with a velvety touch. Flowers are cerise, through pink to white, either singly or a few, on short pedicels. Flowers open around midday and close towards evening.

Braunsia maximiliani **(Schltr. & Berger) Schwantes** This interesting creeping, mat-forming species has leaves which are velvety to the touch. The grey-green leaves are trigonous with the cartilaginous margins. The flowering branches are 4—leaved and erect. The flowers are bright pink.

Distribution: Occurs from Vanrhynsdorp, across the Gifberg, southwards through the Pakhuis Pass to Clanwilliam in the SW Cape.

Braunsia vanrensburgii **(L Bolus) L Bolus** This attractive species grows up to about 8 cm high with decumbent branches. The pale-green, glaucous leaves, often with pinkish tinge on the keels, are sub-erect to erect, with the flowering leaf-pairs erect. The leaves are flattened with sharp keels and margins. The flowers are white.

Distribution: Occurs in the region around Bredasdorp in the Overberg.

Carpobrotus N.E. Br.

The species of *Carpobrotus* are another of the 'weedy' plants of which some are very common in cultivation and have escaped their confines to become translocated as far afield as Australia, California, Chile, S Europe and elsewhere. Some species are endemic to Australia and Tasmania and Chile. Their growth is very prolific and they ramify into large, dense stands. They are used extensively to consolidate sandy soils. The species are not too dissimilar and differentiation between the species is not too simple. The straight, to curved serrate leaves are long, triquetrous, smooth and green in colour. The flowers are very large and showy, ranging from white through yellow to pink and purple, often with different-coloured flowers on the same plant. The fruit of some species are eaten and made into jam in South Africa: *C. acinaciformis, C. edulis* and *C. deliciosus*. Three species are discussed here.

Carpobrotus deliciosus **(L. Bolus) L. Bolus** This species forms large mats of prostrate, freely-rooting branches. The acinaciform leaves are sharply pointed and acutely 3—angled. Their colour is green with reddish keels. The solitary flowers are large, showy and pink to purple.

Distribution: Occurs from about Riversdale in the SW Cape to the S of the former Transkei.



Robin Frandsen



Bob Chinnock. Inset Priscilla Burgoyne SANBI

1. *Bijlia dilatata* better known as *B. cana.* *A* plant in habitat W of Prince Albert
2. ***Braunsia maximiliani*** in cultivation Inset: in habitat on the Vanrhyns Pass, W of Vanrhynsdorp, N Cape
3 & 4. ***Braunsia vanrensburgii*** in habitat at de Hoop, near Bredasdorp, SW Cape
5 & 6. ***Carpobrotus deliciosus*** (5) in cultivation (6) In habitat in the Baviaanskloof, SW Cape



Priscilla Burgoyne SANBI



Niels Jacobsen

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Carpobrotus edulis **(L.) L. Bolus** Is a very robust species which branches freely up to about 3 m long, is strongly and extensively rooted and very sprawling. The leaves are triquetrous and nearly straight with the keels serrate. The showy flowers are usually yellow, fading to pink when withering, but whitish and pink flowers are known. The ripe dry fruit is used for the production of jelly or jam and has a fresh lemon flavour.

Distribution: Although it has spread trans-continentally the natural habitat is recognised as being from Namaqualand across to the E Cape. It has been naturalised in S Great Britain, California and E and W Australia

Carpobrotus mellei **(L. Bolus) L. Bolus** This species, like the others discussed, forms large mats and branches freely. The leaves are almost scimitar-shaped with sharp keels which are serrate near the apex. The large, showy flowers are pink to purplish-pink.

Distribution: Tends to favour higher mountainous areas from Paarl in the SW Cape to Prince Albert.

Carruanthus (Schwantes) Schwantes

Related to *Bergeranthus*, *Carruanthus* is a beautiful and striking genus, which includes two species. The leaves are firm and large, shining green and triquetrous in cross-section and toothed along the edges. They are keeled and are chin-like at the apex. The plants are easy in cultivation.

Carruanthus peersii **L. Bolus** This species incorporates the previously well-known *C. caninus*. The plants are rather compact, caespitose clumps with triquetrous immaculate green leaves and have tubercles along the reddish edges of the leaf-faces which are tipped with a pungent tip. The flowers are yellow.

Distribution: Occurs in the region around Willowmore in the S Cape

Carruanthus ringens **(L.) Boom** This is a compact plant which easily grows leggy in cultivation. The leaves have a marked boat-shaped, humped keel below the apex. The edge has many to few stout pungent teeth along the upper edges of the leaves. Their colour is green. The flowers are yellow and are borne on a long stalk.



Carruanthus ringens
in cultivation
Photo Ernst van Jaarsveld

Distribution: Occurs in the region between Oudtshoorn and Uniondale in the W Cape.

Cephalophyllum N.E. Br.

This genus has some of the most spectacular flowers of the group. Their form is compact, creeping, or tufted or sometimes erect. The leaves are three-angled, from light to dark green in colour and smooth. The brilliantly-coloured flowers are usually formed in large clusters in a large range of colour, often bicoloured and with the centre of the flower sometimes strikingly different in colour to the petals. They open in the morning and close at night. There are approximately 32 species of which 5 are discussed here.

Cephalophyllum griseum **(S.A. Hammer & U. Schmiedel) H.E.K. Hartmann** This species forms loose clumps of green triquetrous leaves which appear grey by virtue of the thick, waxy coating. The large flowers are white.

Distribution: Occurs in the N Knersvlakte, S of Bitterfontein.

Cephalophyllum pillansii **L. Bolus** This is an attractive species which forms compact clumps of robust green to grey, cylindric pointed leaves. They have a heavy wax coating. The flowers are yellow with contrasting brown stamens. The flowers are produced on a long pedicel which bears the fruit in a ring around the plant.

Distribution: Occurs from NW Namaqualand and southwards towards Vanrhynsdorp.



Niels Jacobsen



Niels Jacobsen



Priscilla Burgoyne SANBI



Niels Jacobsen



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch

1 & 2. ***Carpobrotus edulis*** (1) in habitat near Sedgefield, S Cape
(2) A pink-flowering form from Papiesfontein, near Jeffreys Bay
3. ***Carpobrotus mellei*** in cultivation near Port Elizabeth

4 - 6. ***Carruanthus peersii*** (4 & 5) in cultivation
(6) in cultivation at Kirstenbosch Botanic Gardens
7. ***Cephalophyllum griseum*** in habitat near Bitterfontein, N Cape
8. ***Cephalophyllum pillansii*** in habitat near Concordia, N Cape

Bob Chinnock



Bob Chinnock



***Cephalophyllum spissum* H.E.K. Hartmann** This is a strictly compact, clump-forming plant the leaves of which are anisophyllus when young. They are triquetrous, smooth and dark green and up to about 6 cm in length. The flowers are purple to pink, lighter inside.

Distribution: This species is confined to the Knersvlakte, where it is common and in association with *Argyroderma* plants in among the quartz pebbles.

***Cephalophyllum staminodiosum* L. Bolus** This is a creeping species but with very short branches, giving the appearance of being a caespitose tuft. The leaves are rounded, not keeled, also at the apices. Their colour is darkish-green without a wax coating. The flowers are white.

Distribution: Occurs between Garies and Springbok.

***Cephalophyllum tricolorum* (Haw.) Schwantes** This species has a creeping habit, with long terete, dark green to greyish glaucous leaves. The flowers are yellow with purple filaments and brownish anthers.

Distribution: Occurs in central Namaqualand, from Nieuwoudtville, across to Vanrhynsdorp and southwards through Pakhuis in the Cedarberg to Clanwilliam.

Cerochlamys N.E. Br.

This genus is concentrated in the Little Karoo but is also found near Laingsburg. The plants are compact, almost caespitose with age and almost stemless with the reddish grey-green leaves wax-coated. Flowers are open from late morning to dusk. The genus was previously regarded as monotypic but Heidi Hartmann has increased it to 4 species. Two species are discussed here. Flowers open at late morning and close in the evening.

***Cerochlamys gemina* (L. Bolus) H.E.K. Hartmann** This attractive clump-forming species, up to about 6 cm tall, has triquetrous, acuminate, keeled and glabrous leaves which are pale green sometimes tinged with pink and pink-red towards the apex on the margins and keels. Flowers are Pink.

Distribution: Occurs around the Laingsburg district.

***Cerochlamys pachyphylla* (L. Bolus) L. Bolus** This species forms small tufts. The triquetrous, firm, club-shaped leaves are somewhat sideways twisted at the apices. They are heavily coated with wax, which accounts for the purplish grey-green colour. Flowers are usually purple, occasionally white and very rarely yellow.

Distribution: From W of Oudtshoorn across the Little Karoo.

Chasmatophyllum Dinter & Schwantes

This genus has not been carefully assessed and future taxonomic study may well see changes in its 8 taxa. The plants are small, creeping cushions or small shrubs and are spread on short thick underground rhizomes. A recognisable feature is the small, fairly prominent white tooth which is terminally produced on the back of the leaves. The leaves are rough with oxalate crystals forming prominent to small warts. Flowers are open from late afternoon to early evening.

***Chasmatophyllum musculinum* (Haw.) Dinter & Schwantes** Originally described as *Stomatium musculinum* these compact to caespitose plants form short thickish rhizomes from which adventitious roots are produced. Leaves are trigonous to triquetrous with the margins having 0—4 teeth. The pale, green to bluish-green leaves are rough, with raised warts. The flowers are bright yellow, with the outside often purplish-suffused, which makes the closed flowers appear pink. These open late afternoon to early evening.

Distribution: Widespread from a disjunct occurrence in the Great Karas Mountains in Namibia, to the main localities from about Sutherland in the SW to near Willowmore in the E Cape, NE to W Lesotho to S Gauteng and SW to near Prieska.

***Chasmatophyllum stanleyi* (L. Bolus) H.E.K. Hartmann** This species is a low-growing shrublet, up to about 9 cm high, produced from a thick rootstock. The leaves are trigonous, and keeled with the margins occasionally having teeth. Leaf-colour is green, suffused with yellow, towards the apex. Flowers are golden and suffused with red towards the petal-tips. They are solitary, produced well above the apex of the apical leaves, which are smaller than the others, thus resembling bracts.

Distribution: Occurs from Beaufort West, to Aberdeen and S to Willowmore. and Prince Albert in the Great Karoo.



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

1. ***Cephalophyllum spissum*** in habitat in the central Knersvlakte
2. ***Cephalophyllum staminodiosum*** in habitat in the central Knersvlakte
3. ***Cephalophyllum tricolorum*** in habitat at Wallekraal, SW of Kamieskroon, SW Cape
4. ***Cerochlamys gemina*** in cultivation

5 - 7 . ***Cerochlamys pachyphylla*** (5) in habitat S of Calitzdorp, Little Karoo (6) In habitat near Oudtshoorn. (7) A white-flowered specimen from near Oudtshoorn
8. ***Chasmatophyllum musculinum*** in habitat
9 & 10. ***Chasmatophyllum stanleyi*** in habitat at Committees, NE of Grahamstown, E Cape



Judd Kirkel Welwitch



Bob Chinnock



Priscilla Burgoyne SANBI



Bob Chinnock

Dawie Human



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Cheiridopsis N.E. Br.

The name *Cheiridopsis* refers to the plants being sheathed: *cheiris*=sheath, *opsis*=resembling. Refers to the paper-like sheath covering the new growth in the resting period. They range from small to large shrublets. Leaf-pairs are sometimes anisophyllus. The flowers are sometimes quite brilliant, showy and scented. They open at about midday and close at sunset.

***Cheiridopsis acuminata* L. Bolus** This is a compact, tuft-forming species with grey to bluish-green acuminate shortly-papillate leaves which narrow towards the apex, ending in a keel with an apiculate point. The flowers are pale orange, cream to palest yellow

Distribution: Occurs on the higher portions of the Richtersveld National Park and extending to Springbok in the S.

***Cheiridopsis brownii* Schick & Tischer** This species is a small compact, tuft-forming plant with short stubby mucronate, shortly-keeled leaves, which are connate for nearly half their length. Their colour is greyish-green to brown. Flowers are pale yellow to straw-coloured.

Distribution: This is a desert-inhabiting species, favouring sandy-gravelly soil and also in shale and quartz. I is found from N. Richtersveld in South Africa, coastally to Lüderitz in Namibia.

***Cheiridopsis carol-schmidtii* (Dinter & Berger) N.E. Br.** This is a compact, tuft-forming species with mucronate leaves with toothed keels. Leaves are green, tinged with brown. Flowers are purple to yellow.

Cheiridopsis carol-schmidtii in habitat just E of Aus, S Namibia
Photo Robin Frandsen



Distribution: Occurs beyond the winter rainfall region, W of Lüderitz, favouring quartz.

***Cheiridopsis denticulata* (Sonder) H.E.K. Hartmann** This is a robust species, easily confused with *C. robusta*, with which it frequently hybridises. They are so similar that it is surprising that they have not been merged into one species. It seems that virtually only the chromosomal difference separates them. Plants form compact to caespitose tufts of long narrow mucronate, keeled, green to grey leaves, which are up to about 60 mm long. The showy flowers are cream to yellow.

Distribution: Occurs in the winter rainfall region of the N Cape and narrowly into the summer rainfall region.

***Cheiridopsis herrei* L Bolus** This is a small compact, tuft-forming species, with short, apically-keeled leaves. The leaves are connate for about 1/3 of their length, with the lobes gaping in the growing season. When open the leaf has a large pustule at the base. The leaves are green to greyish, with brownish keels. The flowering branch has 2 leaves and the sterile branches have 4. The flowers, on a short pedicel, are yellow.

Distribution: Confined to the Richtersveld from near the Orange River mouth into the mountains of the National Park.



Cheiridopsis herrei in habitat in the N Richtersveld
Photo Priscilla Burgoyne SANBI

***Cheiridopsis meyeri* N.E. Br.** This compact, many-branched dwarf species, when not in flower, resembles a *Conophytum*. It is closely related to *C. peculiaris* with which it



Robin Frandsen



Niels Jacobsen



Judd Kirkel Welwitch



Judd Kirkel Welwitch

1 & 2. ***Cheiridopsis acuminata*** (1) in habitat on Helshoogte, Richtersveld National Park. (2) In habitat near Springbok
3. ***Cheiridopsis brownii*** in habitat in deep sand near Beauvallon, NW Richtersveld
4 & 5. ***Cheiridopsis denticulata*** (4) in habitat in the Richtersveld (5) In habitat near Bulletrap, NW of Springbok
6. ***Cheiridopsis meyeri*** in habitat NW of Steinkopf, Richtersveld

Welwitch Judd Kirkel



Priscilla Burgoyne SANBI



is frequently found. The growth is usually with two dimorphic leaf-pairs, with up to about 80 leaf-pairs. These are green, often suffused with purple and have pellucid spots. The flowers are yellow.

Distribution: Occurs on the Steinkopf plateau, also about 30 km W of Steinkopf.

Cheiridopsis namaquensis **(Sonder) H.E.K. Hartmann** This species forms a compact tuft of compact narrow heterophyllous green to grey leaves which, when resting, are tightly clasped together. The apex of the mucronate leaf is sharply keeled. The showy flowers are yellow. One of the forms is popularly known as and previously described as *C. cigarettafera. See the illustration*.

Distribution: Widely distributed in the drier parts from the Richtersveld, southwards into Namaqualand and across to E of Laingsburg.

Cheiridopsis peculiaris **N.E. Br.** As its name suggests this is a rather peculiar and unmistakable species. It develops 2—3 branches. The leaves are markedly heterophyllous. The outer pair of acute leaves are flat, spathulate, with small inner leaves. The leaves are glabrous, green somewhat reddish-tinged. The flowers are brilliant yellow and very showy.

Distribution: Localised on shale, W and at Steinkopf in the SE corner of the Richtersveld.

Cheiridopsis pillansii **L Bolus** This large clump-forming species has broad, thick leaves the pairs of which are united for about 1/3 their length the leaf edges are sharply defined with a sharpish apical keel. The leaves are papillate and are greyish-green. The leaves are firmly adpressed and opening only narrowly to allow flowers to emerge. The large flowers are yellow and are borne on an almost sessile pedicel.

Distribution: Occurs in the Richtersveld from just NE of the Oograbies Mountains to N of Lekkersing.

Cheiridopsis robusta **(Haw.) N.E. Br.** This species has 4 leaves to a branch, with the one pair smaller than the other. The leaves are up to about 5 cm long, united for about 1/4 their length. The inner surfaces are flat and the outer with a rounded keel, sharper at the apex. Their colour is pale green to greyish, reddish tinged towards the apex. The cream to yellow flowers arise from a short pedicel, not usually over-topping the leaves.

Distribution: Occurs from S of Lüderitz in Namibia to S Richtersveld on sandy flats.

Cheiridopsis velox **S.A. Hammer** This is a clump-forming, compact species which develops long straight branches. It grows up to about 10 cm tall or taller, with green keeled long, erect, incurved or recurved leaves with green to brown teeth on the keels and margins and mainly at the apex. The flowers are lemon-yellow, lighter towards the inner parts.

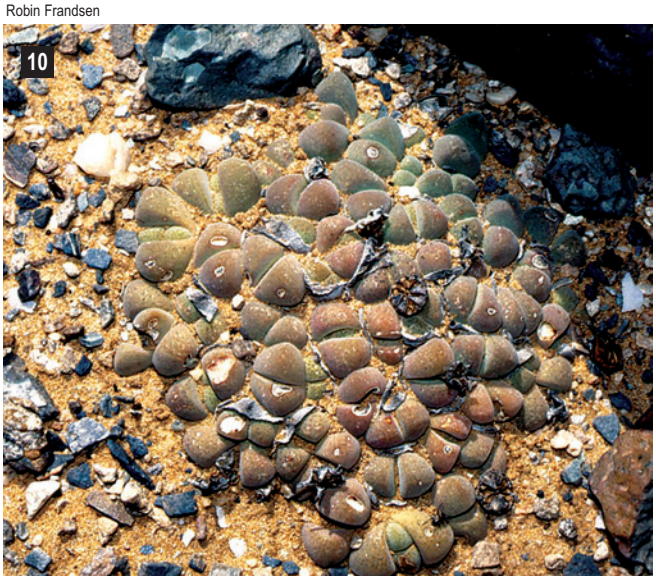
Distribution: On quartzitic slopes S of Khubus Richtersveld.

Cheiridopsis verrucosa **L. Bolus** This is a mat-forming, species with numerous sub-globose bodies well sunken in the sand. The leaf-pairs are tightly adpressed and their colour is greenish-brown. The flowers are yellow.

Priscilla Burgoyne SANBI



Robin Frandsen





Priscilla Burgoyne SANBI



Robin Frandsen



Judd Kirkel Welwitch



Robin Frandfsen

1 - 3. ***Cheiridopsis namaquensis*** (1) in habitat near Kamieskroon
(2) In habitat N of Matjiesfontein. (3) (*C. cigarettafera*) in habitat W of Springbok
4. ***Cheiridopsis peculiaris*** in habitat W of Steinkopf
5. ***Cheiridopsis pillansii*** in habitat near Eksteenfontein
6 - 8. ***Cheiridopsis robusta*** (6 & 7) in habitat in the Richtersveld
(8) In habitat in S Richtersveld
9. ***Cheiridopsis velox*** in habitat near Khubus, W Richtersveld
10 & 11. ***Cheiridopsis verrucosa*** (10) in habitat at Kortdoring, W of Beauvallon
(11) In habitat near Beauvallon



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch

Priscilla Burgoyne SANBI



Robin Frandsen





Priscilla Burgoyne SANBI

Distribution: This species inhabits the deep sand and sand-filled rock cracks from just E of Alexander Bay, eastwards towards Sendelingsdrif in the Richtersveld.

CONICOSIA N.E. Br.

The plants of this genus are perennial or occasionally biennial with deciduous heads of tufted leaves, with laterally growing flowering branches. The long leaves are triquetrous or cylindric. The reason for this genus' inclusion here is the brilliant show of very large flowers and the sometimes massed display. Two species with 2 subspecies of *C. pugnioformis* are recorded. Flowers open in the afternoon and close at nightfall.

CONICOSIA ELONGATA **(Haw.) N.E. Br**. This variable species is deciduous with linear cylindric green to grey-green leaves, forming large clumps. Leaves are up to about 15 cm long. The flowers are large and shiny yellow to whitish. The plants form dense stands on sandy ground.

Distribution: Rather widely distributed in the NW and W Cape, but away from the coast.

CONICOSIA PUGIONIFORMIS **(L.) N.E. Br**. This species has a thin tap root and varies radically from the previous species, which has a thick and tuberous tap root. Its prominent head of leaves persists even in the dry season and is evident even when the rest of the veld is brown. The green leaves are sub-triangular, linear and some are perennial. The flowers are darker yellow. The subspecies are *alborosea* and *muirii*: these are not discussed or illustrated as the differences are in aspects not usually discussed in the work.

Distribution: Widely spread from S Richtersveld, southwards to the S Cape. The subsp. *alborosea* occurs in the northernmost range and the subsp. *muirii* is confined to the district of Caledon to Knysna.

CONOPHYTUM N.E. Br.

Conophytum is a very large genus with a big range of shapes and sizes, from the very tiny, single-headed *C. achebense*, possibly the smallest of all succulent plants, to the large, single-headed *C. burgeri*. The plants are all double-lobed, with some deeply divided and divergent lobes and some lobes separated only by a short slit through which the flowers are produced. Some species form clusters well in excess of 100 heads, some produce only a few and some are almost invariably single-headed. Some have their flowers opening only in the day and some at night. Many are beautifully marked with coloured stripes, patches, speckles or spots, some have few markings and some are unmarked; some have raised coloured pustules and lumps others are smooth—see the four pictures opposite showing examples of this variation. Some are scentless and others are strongly- or weakly-scented, especially the nocturnal-flowering species.

Identification between the subspecies and varieties is sometimes confusing. The photographs will represent these various forms. The names given to these forms are in apostrophes. It may be expected that the nurseries who specialise in this genus will supply seed or plants which are correctly identified.

It can be seen from the accompanying text and pictures that this species is very desirable and popular with collectors who enjoy growing the plants properly to achieve their maximum beauty, even if some of the plants with small heads need a magnifying glass to best appreciate them. To appreciate the form, intricacies and beauty of these plants it is rarely possible to see this in nature as these plants are subject to the vagaries of weather, where they are at their best only after rare rains and are sometimes insect- or animal-damaged. For this reason the best way to appreciate this is to illustrate the plants as they are cultivated. A number of habitat pictures are however included.

The previously well-known genus *Ophthalmophyllum* was abandoned and its members, the somewhat *Lithops* look-a-likes, were controversially transferred to *Conophytum*.

Because this is such a large genus with many forms it is not possible to include all taxa, but a large cross-section has been included.

CONOPHYTUM ACHABENSE **S.A. Hammer** This is regarded as the smallest of the genus, indeed, possibly the smallest mesemb, smaller even than *C. devium*. The little pear-shaped glabrous body is barely 2.5 mm in diameter. It is usually solitary but rarely producing 3—4 heads. The base is swollen with the top half constricted with a non-gaping bilobed apex. The colour is green to yellowish-green, dark green towards the apex and spotted, pustulate on the sides. Flowers are diurnal, sweetly scented and pink to rose in colour.

Distribution: Confined to the W end of the Namiesberge in the Bushmanland, some 40 km SW of Pofadder.



Judd Kirkel Welwitch



Judd Kirkel Welwitch

1 & 2. ***Conicosia elongata*** (1) in habitat at Skilpad, Namaqua National Park.
(2) in habitat near Concordia, NE of Springbok
3. ***Conicosia pugioniformis*** in habitat in Namaqualand
4. ***Conophytum achabense*** in cultivation



Darrel Plowes









The genus Conophytum *has a large range of different forms and sizes. The varying forms comprise, among many, such extremes as, the very large* C. burgeri *(above left), the clump-forming species, with a number of heads, such as* C. ectypum *(above right), the species with very many tiny heads such as* C. saxetanum *(below left) and the* Lithops*-like species, such as* C. limpidum *(below right)*

François Hoes



***Conophytum acutum* L. Bolus** This is a small, species, which produces a single glabrous body—very rarely branched—bright green to yellowish to reddish. The two lobes are often gaping, the apex is transparent and obscurely spotted. It is all but subterranean when dormant with only the top of the plant exposed when active. The nocturnal, sweet-smelling, ivory-white flowers have a long corolla with the petals flared out when open.

Distribution: Occurs SW of Kliprand, near to the NW of the Knersvlakte and N & NW of Bitterfontein.

***Conophytum albiflorum* (Rawe) S.A. Hammer** This charming diminutive species ramifies into dense flat mats. The bodies are cylindrical at the base, ovoid and keeled at the tops. The epidermis is glabrous, dark grey-green to brownish-green or deep maroon, with dark spots and lines. The keel and cleft edges are sometimes purplish. The early-autumnal, diurnal, scentless flowers are white to faintly pink. It is not an easy-to-cultivate species which needs late-summer wetting to sustain its early autumn flowering, otherwise the flowers are compromised.

Distribution: *C. albiflorum* is a SW coastal species, occurring near Paternoster, through to St Helena Bay, where it is plentiful.

***Conophytum angelicae* (Dinter & Schwantes) N.E. Br.** This species cannot be confused with any other. The bodies cluster densely and sometimes form large aggregations. The bodies are about 20 mm in diameter. Two subspecies are recognised: subsp. *angelicae* and subsp. *tetragonum*. Their opalescent (when turgid) or dull leaden colour and their nacreous lumpiness sets them apart. In subsp. *angelica* the colour is beige-brown, yellowish-grey, olive-green or greyish-violet with a few translucent spots. The bodies are obconic, convex to truncate at the apex. In subsp *tetragonum* the colour and sheen is similar to the nominate species, with perhaps the addition of a sometimes reddish sheen. The shape is cylindric below, quadrate as seen from above, the apex is concave to truncate. Flowers are produced in early autumn, are nocturnal and reddish-brown, to pale orange and rarely deep violet. Both are easy in cultivation provided they receive adequate water. Too much strong light will destroy the plants and they should receive a shaded environment.

Distribution: The subspecies *angelica* occurs on both side of the Orange River from Pofadder-Aggeneys to SE of Warmbad, with small adjunct populations found N of Steinkopf and near Grünau. The subspecies *tetragonum* occurs in the NE Richters-veld and in the S of the national park on the Oemsberg, also NE of Steinkopf.

***Conophytum armianum* S.A. Hammer** This small, mat-forming plant ramifies up to 10 heads. Its epidermis is shiny when turgid, coppery-brown to purplish-grey in colour with dark pustulate or flat idioblasts. Flowers are autumnal. Initially they are nocturnal but remain open as they mature. The colour is pink to coppery-salmon. *C. armianum* is easy in cultivation, needing half-shade.

Distribution: *C. armianum* is restricted to around Umdaus in the W Richtersveld, where they are very plentiful at certain spots.

***Conophytum arthurolfago* S.A. Hammer** This round and truncate at the top species is beautifully patterned like a complicated persian carpet design. The epidermis is glabrous with the exception of the sides, which are minutely papillate. The colour is brownish-green to reddish, minutely rugulose, with green channels. The flowers are autumnal, scentless and magenta in colour. *C. arthurolfago* is easy in cultivation.

Distribution: *C. arthurolfago* is known only from Brakfontein, NW of Loeriesfontein.

***Conophytum auriflorum* Tischer** This small plant densely clusters up to 15 heads. There are two subspecies: *auriflorum* and *turbiniforme*. The subspecies *auriflorum* is cylindric, with a convex apex. The fissure is surrounded by a minutely papillate dark-green band. The colour is green to reddish-green, speckled with whitish dots. The subspecies *turbiniforme*'s shape is as an inverted cone. The epidermis is speckled with whitish dots and has a sprinkling of green dots (raphides). It is sometimes obscurely keeled and the fissure is surrounded by a dark green, papillate band. Flowers are diurnal, scentless and bright yellow. Very easy in cultivation.

Distribution: The subspecies *auriflorum* is patchily very abundant near and to the e of Kommagas. The subspecies *turbiniforme* is found at only on locality on the Spektakel Pass between Kommagas and Eselfontein.



Gerhard Beukes



François Hoes



François Hoes



François Hoes



François Hoes



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

1 & 2. ***Conophytum acutum*** (1) in habitat on the Knersvlakte, N of Vanrynsdorp. (2) in cultivation

3. ***Conophytum albiflorum*** in habitat at Kasteelberg, NE of Malmesbury

4 - 6. ***Conophytum angelicae*** (4) in cultivation from Near Pofadder (5) From N of Steinkopf. (6) In habitat

7. ***C. angelicae* subsp. *tetragonum*** from Klipbok, E of Eksteenfontein, Richtersveld

8 & 9. ***Conophytum armianum*** in cultivation from Wyepoort Valley, Umdaus

10 & 11. ***Conophytum auriflorum*** (10) in cultivation (11) In habitat at Komaggas, SW of Springbok

12 & 13. ***Conophytum arturolfago*** in cultivation from Brakfontein, NW of Loeriesfontein



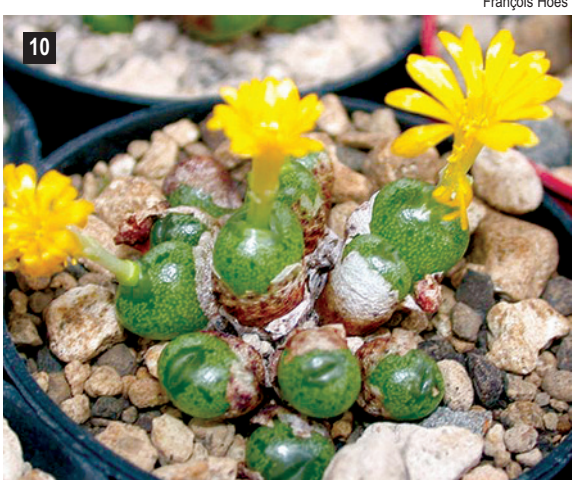
François Hoes



François Hoes



François Hoes



François Hoes



Judd Kirkel Welwitch



***Conophytum bilobum* Marloth** *C. bilobum* was the first of the species to have attracted scientific attention. It is a variable species with a number of subspecies and varieties: subsp. *bilobum,* var. *bilobum, var. altum*, var. *elishae, var. linearilucidum,* var. *muscosipapillatum*; subsp. *altum*; subsp. *claviferens*; subsp. *gracilistylum*. This is a particularly attractive species, generally beautifully marked and fairly large. The lobes are widely divergent with a deep cleft. The apices and the inner edges of the lobes are keeled. The colours are pale whitish-green to deep green and sometimes reddish. The keels are usually bright red or purple. The large scentless flowers are deep golden to pale yellow, sometimes pink or white, open in the afternoon. Flowers of subsp. *gracilistylum* are white. This is one of the easiest of the conophytums to cultivate.

Distribution: Most *C. bilobum* taxa inhabit the Richtersveld area with subsp. *elishae* occurring in the vicinity of Springbok and subsp. *claviferens* near Kommagas, W of Springbok. The species, although common in the Richtersveld National Park, does not appear to cross the Orange River into Namibia.

***Conophytum blandum* L. Bolus** This species is superficially similar to *C. bilobum*. The multi-headed bilobed bodies are paler than *C. bilobum* and are whitish to blue-green, sometimes reddish. They have a sharp horny apiculus. The fissure is densely ciliate. The margins are marked with pellucid greenish spots and sometimes with red lines. The lightly-scented flowers are spoke-like, white to light pink and open in the afternoon. Very easily cultivated and they cluster freely.

Distribution: *C, blandum* is known from a poorly-known area of W Bushmanland some 20—30 km E of Steinkopf.

***Conophytum breve* N.E. Br.** This species is closely related to *C. calculus* and *C. pageae*. It is a small species as its name suggests. It forms extensive uneven clusters of globose to slightly obconical, green to yellow-green glabrous bodies. The flowers are autumnal, nocturnal and heavily-scented. their colour is yellow. An extremely easy species to grow and flowers readily if amply watered.

Distribution: Widespread throughout the Richtersveld, from W of Steinkopf across to the Oograbies Mountains and northwards into the Richtersveld National Park.

***Conophytum brunneum* S.A. Hammer** This is a densely clustered, species up to 30 mm in diameter, with a very restricted in distribution where it is extremely common. The bodies are glabrous, small—up to 5 mm wide, ovoid, reddish-brown, rarely green, with whitish speckles. Flowers appear early in autumn, are diurnal and scentless.

Distribution: Occurs on only a few hills in the N Knersvlakte where it is very plentiful.

***Conophytum burgeri* L. Bolus** This is one of the most unusual of the genus. This species is usually single-headed but rarely with up to 2—3 smaller bodies clustered around the large 'parent' body. The odd-shaped body is flat along the bottom with small, puny roots. The plant-body tapers upwards like a cone, with a short, sometimes inconspicuous slit at the apex from where the flower emerges. The epidermis is translucent, shiny-glabrous, pale-green to purplish with many obscure pellucid dots. The dry sheath is flaky but persistent, particularly at the apex. This is a large species which can, in cultivation, achieve the size of a hen's egg. Flowers are purplish-red with white centres. *C. burger* is extremely rare in the wild. It is available in cultivation and is not particularly difficult but it is sensitive to being disturbed because of its frail root system. It should not be watered soon after transplanting. Propagation by seed.

Distribution: *C. burgeri* is found at a single locality near Aggeneys amongst quartz pebbles in a valley.

***Conophytum calculus* (Berger) N.E. Br.** This large globose, chalky and unspotted species and its epidermis is remarkable tough. It comprises two subspecies: *calculus* and *vanzijlii*. The subspecies *calculus* grows up the 30 mm

Robin Frandsen

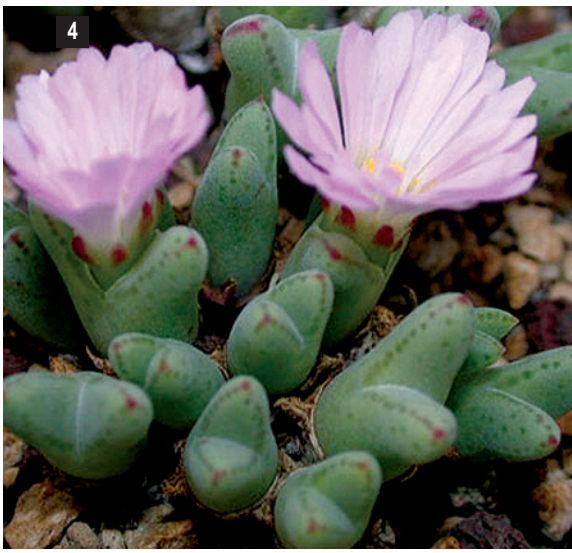




Robin Frandsen



Judd Kirkel Welwitch



François Hoes



François Hoes



François Hoes

1 & 2.***Conophytum bilobum*** (1) in habitat on Helshoogte, Richtersveld
(2) in habitat near Springbok
3. ***C. bilobum* subsp. *altum*** in cultivation
4. ***Conophytum blandum*** in cultivation.
5. ***Conophytum breve*** emerging from rest. In habitat near Springbok
6. ***Conophytum brunneum*** in cultivation from near Nuwerus, N Cape
7. ***Conophytum calculus*** in habitat N of the Sout River, Knersvlakte
8. ***C. calculus* subsp. *vanzijlii*** in habitat on the farm Haramoep, near Pofadder
9 & 10. ***Conophytum burgeri*** (9) in habitat near Aggeneys, Bushmanland
(10) in habitat near Aggeneys, Bushmanland



Priscilla Burgoyne SANBI

Gerhard Beukes



Ernst van Jaarsveld



Priscilla Burgoyne SANBI



in diameter and subsp. *vanzijlii* is somewhat smaller. It is uni-coloured, and is chalky pale green to pale yellowish-green, never red and forms small clusters of a few heads. The subspecies *vanzijlii* is similar in shape but varies from subsp. *calculus* in its variation of epidermis. Colour: whitish-green, blue-green, beige or a pale bluish-brown, sometimes suffused with pale red at the fissure. Flower are nocturnal, heavily scented and golden yellow to deep reddish-orange in subsp. *calculus* and pure white yellowish-white or salmon through to pale pink in subsp. *vanzijlii*. It is not difficult in cultivation but reacts badly to insufficient light, becoming etiolated and refusing to bloom. Both taxa occur in amongst quartz pebbles.

Distribution: *C. calculus* subsp. *calculus* is known from the N Knersvlakte to as far north as Bitterfontein. The subspecies *vanzijlii* occurs between Smorenskadu, E of Springbok and Pofadder, where in the E it is subject to some summer rainfall.

CONOPHYTUM CARPIANUM **L. Bolus** This species forms caespitose bodies of tightly-packed papillate bodies, which are up to 6 mm at their widest. The leaves are cylindric to ovate, gaping, rounded or sharply keeled at the apex and dark green to purplish, with pale brown idioblasts. The keels are sometimes marked with red or purple lines. The autumnal flowers are diurnal and scentless. Their colour is straw-yellow.

Distribution: Known only from a small area near Doringpoort, S of Khubus in the Richtersveld.

CONOPHYTUM CHAUVINIAE **(Schwantes) S.A. Hammer** This very small cushion-forming species has sharply-keeled, divergent lobes. The bluish, grey-green epidermis is velvety with white trichomes and the keels are marked with a purple to reddish stripe along the keel and sometimes trifurcated into the gape. The cerise diurnal, autumnal, scentless flowers are produced on a long pedicel. This is an easy and attractive subject in cultivation and should be given maximum light.

Distribution: Fairly widely distributed and rather locally abundant in a rather limited range which is from SE of Garies to the N Knersvlakte.

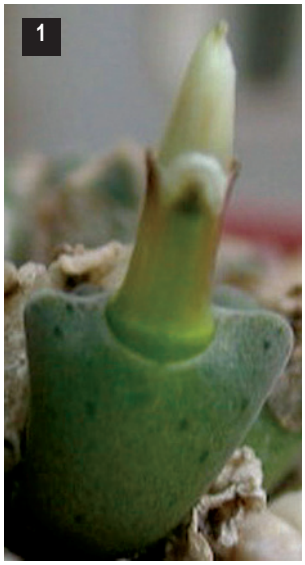
CONOPHYTUM CHRISOCRUXUM **S.A. Hammer** This interesting small *Conophytum*, the diameter of which is no more than 15 mm in diameter, is distinguished from all others by its transverse red or green line bisecting the fissure on its truncate apex. It is slow to multiply and in habitat reaches only up to 3 heads. The epidermis is glabrous, light green to bluish-green, never reddish with a few idioblasts, with a small fissure which is encircled with a darker green. The fissure is bisected with a red to dark green line which is sometimes vague and is more evident in habitat than in cultivation. Flowers are diurnal and scentless and coloured pale yellow. Should be given strong light in cultivation to enhance its cruciform apex. Occurs in shaded quartzite crevices.

Distribution: *C. chrisocruxum* is known from a single east-facing locality S of the Anenous Pass, W of Steinkopf.

CONOPHYTUM CHRISOLUM **S.A. Hammer** This tiny conophytum is for the specialist but is well-worth cultivating for its uniqueness. It is solitary, rarely 2—headed, tiny (diam. about 5 mm—vying with *C. devium* and *C. achebense* as the smallest of all succulents), flat-topped with a tiny slit for a fissure. The epidermis is glabrous, pale green to ruddy and the apex has some idioblasts. It is most uninteresting until the brilliant, but small flower emerges in early autumn. The colour is a striking magenta. Propagation is from seed and the plant is not difficult in cultivation, but is susceptible to handling damage.

Distribution: *C. chrisolum* is known from a single locality, SW of the Anenous Pass, W of Steinkopf. It is found in quartz grit on the top of a hill.

CONOPHYTUM COMPTONII **N.E. Br.** This is another difficult species best suited for the specialist, but its exquisite markings, best viewed with a magnifying glass, makes it a highly desirable species. The plant, which is up to 5 mm in diameter, ramifies into small cushions up to 20 mm in diameter. The epidermis is greyish-green to reddish-brown, metallic in appearance with fine dark tracery. The top is obscurely keeled. The autumnal flowers are sweetly-scented, nocturnal and coloured yellowish-pink to pale orange, sometimes brownish. Occurs in fine sandstone-grit-filled pans, sometimes found in large numbers near seepages. Difficult in cultivation and it should not be allowed to desiccate too much. Needs a gritty, richer soil with charcoal added.



François Hoes



François Hoes



François Hoes



Judd Kirkel Welwitch

1. ***Conophytum carpianum*** in cultivation from Doring Poort, S of Khubus, Richtersveld
2 & 3. ***Conophytum chauviniae*** in cultivation from Grootriet, N of Bitterfontein, N Cape
4. ***Conophytum chrisocruxum*** in cultivation from Harrasberg, W of Steinkopf
5. ***Conophytum chrisolum*** in cultivation from SW of the Anenous Pass, W of Steinkopf
6. ***Conophytum comptonii*** in cultivation from Van Rhyns Pass

Judd Kirkel Welwitch



François Hoes



Distribution: *C. comptonii* occurs in several localities on the Nieuwoudtville Plateau, near the Van Rhyns Pass and on the Matsiekammaberg SE of Vanrhynsdorp.

Conophytum concavum **L. Bolus** This species is mostly subterranean with just the apex visible. It slowly forms clumps of 6—10 bodies. The epidermis is velvety from fine papillae. The two opposing leaves generally have eccentrically placed fissures, close to each other. The colour is green becoming red preparatory to hibernation. The apex has small 'windows'. The flowers are large and white to pinkish.

Distribution: The species has a very limited distribution, but is plentiful in its range. It is found NE of Hondeklip Bay, N and E of Riethuis.

Conophytum depressum **Lavis** This diminutive species comprises flat-topped fuzzy brownish, 1—2 rarely 4 heads. The little flat disks have short fissures and tend to find themselves buried in the wind-blown sand of the pans at the base of gneiss and granite domes. The subsp. *perdurans* S.A. Hammer is a more robust species. Its colour in nature is brownish to brownish-green, it is fuzzy and not as flat. Flowers are nocturnal, reddish to orange and highly scented.

Distribution: The subspecies *depressum* is fairly widespread, although uncommon, it occurs from Garies in the S to Concordia and further N. The subspecies *perdurans* is less common. It also occurs in shallow sand-filled pans SE of Springbok at the Silverfontein and Rietfontein and Roux farms.

Conophytum devium **G.D. Rowley** This is one of the tiniest of the genus, barely 15 mm tall. It is somewhat pear-shaped with transparent apices to the lobes. The colour is bright green and it is glabrous and solitary, but sometimes forming a small cluster. The autumnal nocturnal flowers are white or rosy-pink with white bases. It grows in quartzite, felspathic sand.

Distribution: Occurs from Eenriet, NW of Springbok northwards to N of Steinkopf and W to Umdaus.

Conophytum ectypum **N.E. Br.** Four of the subspecies of this variable species are shown here. The identification is not simple, relying on the angularity and sheen as well as the raphide-rich depressions in the epidermis. The subspecies *ectypum* forms large cushions with cylindric bases to the leaf body and flattened apex, sometimes with a keel which may be marked with reddish lines. The subspecies *cruciatum* forms small mats. Bodies are glabrous, dark green to dark reddish, with translucent spots, papillate and rhomboidal in shape. The subspecies *brownii* forms large mats and has circular or slightly keeled apices to the bodies, which are glabrous, glossy-green to brown with glossy striations. The subspecies *sulcatum* forms small tight mats. The bodies are deeply concave and keeled, glabrous and glossy when turgid. Usually grey-green. The fissure is slightly papillate. Flowers are showy, diurnal and autumnal and are scentless. Their colour is pink, red or rose with white or yellow centres or deep yellow.

Distribution: From N of Steinkopf, near Umdaus S to near Springbok. The subspecies *cruciatum* occurs abundantly on a single plateau W of Steinkopf and subsp. *brownii* occurs from Bulletrap to Concordia. The subspecies *sulcatum* occurs N of Jakkalswater.

Conophytum ernstii **S.A. Hammer** Two subspecies are recognised: subsp. *ernstii* and subsp. *cerebellum*. The nominate subspecies is flat-topped forming dense clusters of up to about 50 bodies. The bodies are turbinate, flat-topped or slightly concave or convex, sometimes slightly keeled. The fissure is short The epidermis is heavily trichomous, grey-green with dark-green spots. The subspecies *cerebellum* forms small tight clusters truncate to convex, keeled with four facets on the apex. The small fissure is densely papillate. The flowers are pink and lighter towards the centre. The are honey-scented and occur in late Autumn.

John Trager



François Hoes



François Hoes





François Hoes



Robin Frandsen

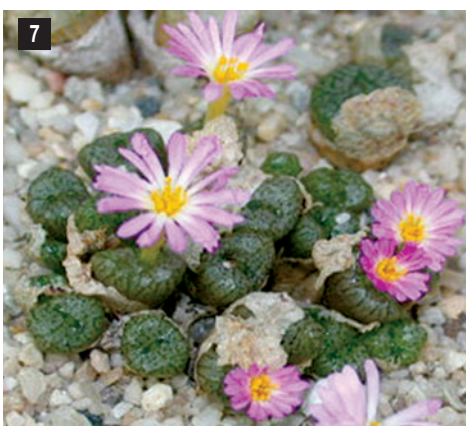


François Hoes

1. ***Conophytum concavum*** in cultivation from Riethuis, SW of Komaggas, N Cape
2. ***Conophytum depressum*** in habitat N of Concordia, with three clones of *C. pellucidum*. Note the grey colour, due to the dense hairy covering
3. *depressum* subsp. *perdurans* in cultivation from Silverfontein, SW of Springbok
4. ***Conophytum devium*** in cultivation
5 & 6. ***Conophytum ectypum* subsp. *ectypum***
(5) In cultivation from Eenriet, NW of Steinkopf.
(6) In cultivation from Umdaus, NW of Steinkopf.
7 & 8. ***C. ectypum* subsp. *brownii*** (7) in cultivation from Kosies, NW of Steinkopf
(8) In habitat E of Anenous Pass, W of Steinkopf
9. ***C. ectypum* subsp. *sulcatum*** in cultivation from Animub, NNE of Steinkopf
10. ***C. ectypum* subsp. *cruciatum*** in cultivation from Breekriet, near the Anenous Pass, W of Steinkopf.
11 & 12. ***Conophytum ernstii*** in cultivation from Sandberg, N Richtersveld National park
13. ***C. ernestii* subsp. *cerebellum*** in cultivation from NE of the Groot Derm of the Orange River



François Hoes



François Hoes



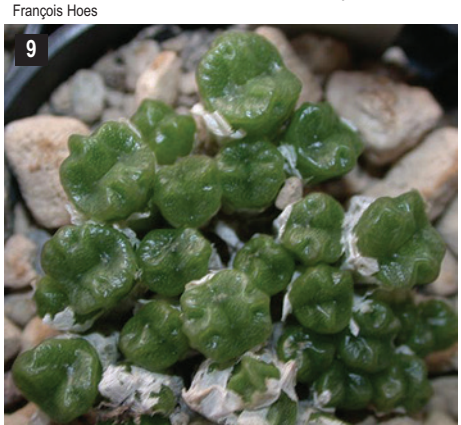
François Hoes



François Hoes



Robin Frandsen



François Hoes



François Hoes

Distribution: The subspecies *ernstii* is confined to the extreme N Richtersveld on Sandberg. The subspecies *cerebellum* is limited to one hill, in Namibia, just across and on the E side of the Orange River as it loops S, just N of the Richtersveld National Park.

CONOPHYTUM FICIFORME **(Haw.) N.E. Br.** This caespitose species forms compact mats or rounded domes of fig-shaped bodies, which are sometimes depressed at the fissure. The epidermis is glabrous or slightly puberulous, greyish-green to light green with greenish dots which also coagulate into lines. The large pink to cerise diurnal, autumnal flowers are highly scented.

Distribution: This attractive species occurs between Worcester and Robertson, where they are often abundant and much concentrated.



Conophytum ficiforme in cultivation from near Worcester, SW Cape *Photo Judd Kirkel*

CONOPHYTUM FLAVUM **N.E. Br.** This robust species forms dense cushions of bodies which elongate with age. The plant bodies are conical with convex, flat or rarely convex apices with a narrow fissure which is obscurely papillate and surrounded by a ring of close-packed translucent idioblasts. The rest of the surface is sparsely dotted with more diffuse idioblasts and is glabrous. The flowers are bright yellow, occur in Autumn and are scentless, opening in the morning.

Distribution: Occurs from the Steinkopf plateau, across to Eenriet in W Richtersveld.

CONOPHYTUM FRIEDRICHIAE **(Dinter) Schwantes** This species has, according to Steven Hammer, 'finger-thick' bodies. I suppose it depends upon which, or whose finger! They are usually solitary but may produce several bodies. They are brownish to greyish-red with a wide non-gaping fissure which is finely papillate. The lobes are convex the bodies are glabrous and the apices are reddish and translucent. Windowed at the apices and to a certain extent down the sides. Flowers are diurnal, and in autumn, these are scented. Their colour is white to pale-pink to carmine.

Distribution: Most common around Warmbad in S Namibia, extending to Karasburg in the N and southwards towards Kakamas in Bushmanland.

CONOPHYTUM FRUTESCENS **Schwantes** This species forms clumps of many heads on somewhat extended stalks. The bodies are bilobed, roundly keeled and cordiform. The gaping fissure can be as much as half the length of the body. The edge of the fissure is subtended by an arrow-shaped translucent patch. The epidermis is glabrous and waxy in appearance. The colour is initially green becoming purplish-red with spots with age. The flowers occur in spring and are diurnal and scentless. They vary in colour: salmon-pink, often blood-red in bud, orange, salmon or terracotta or rarely pink, the only bilobe with reddish flowers.

Distribution: Abundant on the quartzite hills around Kommagas and S on the Kourkammaberg W and SW of Springbok in Namaqualand.

CONOPHYTUM FULLERI **L. Bolus** This species forms dense mats of many heads. The leaf-bodies are obconical with the apex rounded. The colour is pale green but purplish in late winter, when first exposed. The surface is covered with small translucent blisters. The leaves are connate with a very short fissure. The autumnal, diurnal flowers are dark pink, rarely white.

Distribution: Very common between rocks around Pofadder and Namies in Bushmanland.

CONOPHYTUM GLOBOSUM **(N.E. Br.) N.E. Br.** Forms dense mounds of many heads. The glabrous, globose, occasionally slightly truncate, bodies are pale green to bluish-green with somewhat obscure translucent spots. The autumnal, diurnal and prolific flowers are white or pink with whitish centres.

Distribution: Occurs from Garies and southwards to Kotzesrus in Namaqualand.



Judd Kirkel Welwitch



François Hoes



Gerhard Beukes



François Hoes



Gerhard Beukes



Gerhard Beukes

1 & 2. ***Conophytum flavum*** (1) in habitat (2) In cultivation from the Wyepoort Valley, Umdaus
3 & 4. ***Conophytum friedrichiae*** (3) in habitat on the Farm Eendoorn, Warmbad, Namibia. (4) In habitat on the farm Witsand, Warmbad, Namibia
5 & 6. ***Conophytum frutescens*** (5) in cultivation from Kommagas. (6) In habitat
7. ***Conophytum fulleri*** in habitat near Pofadder
8. ***Conophytum globosum*** in cultivation

François Hoes



Judd Kirkel Welwitch



Conophytum herreanthus **S.A. Hammer** This distinctive and attractive large species was previously described by Schwantes as *Herreanthus meyeri.* It comprises two subspecies: *herreanthus* and *rex*. This species forms small mats. The glabrous leaves, which are fused for the lower third, are triquetrous, their colour is pale whitish-green with sharp reddish margins and sharply apiculate. They are unspotted or with a few bluish spots. Their diurnal jasmine-scented flowers are showy and white to pink. The subspecies *rex* varies in being larger and showier, with less-sharp, sometimes scalloped margins with the keels some-times red. The larger heavily-scented flowers are deep rose, pink or white. Flowers of the species are autumnal and diurnal.

Distribution: The subspecies *herreanthus* is rare, possibly extinct, in its habitat which is a small area at Umdaus, N of Steinkopf in the Richtersveld. The subspecies *rex* is wider spread around E Richtersveld: Klipbok, Nababiepberge and Little Helskloof.

Conophytum hians **N.E. Br.** This species forms dense mats or low cushions. The small, barely 18 mm tall, sharply-keeled bodies are almost ovoid and shortly bilobed. They are covered with dense white papillae which are often arranged in perpendicular rows. The colour is pale to bluish-green. The autumnal, sweet-smelling flowers are nocturnal. Their colour is white, pink or orange-red, often with darker tips.

Distribution: Widely distributed through the W Richtersveld and S to just N of Kleinzee.

Conophytum joubertii **Lavis** This is a small species which forms dense cushions up to about 30 mm tall. The little ovoid purplish to dark-green bodies have a short, closed slit which is fringed with darker borders. Vertical darker green lines replace the keels. The glabrous, dotted bodies are shiny pale to dark green. The sweetly-scented flowers are nocturnal and their colour is white.

Distribution: Confined to a small area in the S Little Karoo from S of Vanwyksdorp to E of Garcias Pass on shale in the E and more in quartz in the W.

Conophytum jucundum **(N.E. Br.) N.E. Br.** Has four recognised subspecies. It forms caespitose and loose clusters of sub-globose to somewhat turbiniform bodies; always rounded with a short fissure. The glaucous, rarely papillate epidermis is pale whitish-green to bluish-green, sometimes yellowish-green, with a few darker green dots. The subspecies *jucundum* is spherical, dull in colour and has a dimpled epidermis. The subspecies *fragile* varies in being smaller than the nominate subspecies, with long white or pink flowers. The subspecies *marlothii* is even smaller, always flat-topped and with marbled markings. The subspecies *ruschii* is larger, paler, well-spotted and with well-rounded edges and very large pink or white flowers. Flowers are diurnal, autumnal and scentless.

Distribution: The species is confined to just N of the Orange River and the adjacent Richtersveld. The subspecies *jucundum* occurs from Lorelei in Namibia to N of Eksteenfontein. The subspecies *fragile* occurs around Numees, which is an abandoned mine in the W Richtersveld National Park. The subspecies *marlothii* occurs on the E slopes of the Oograbies Mountains, E of Port Nolloth. The subspecies *ruschii* occurs from Lorelei, and S to the Rosyntjieberge in the Park.

Conophytum joubertii Left: in habitat at Springfontein, S Little Karoo. Right: in habitat S of Vanwyksdorp, S Little Karoo, on sub-vertical shale, where it grows with *Gibbaeum dispar* Photos Robin Frandsen







Bob Chinnock



François Hoes



François Hoes



François Hoes



François Hoes



François Hoes

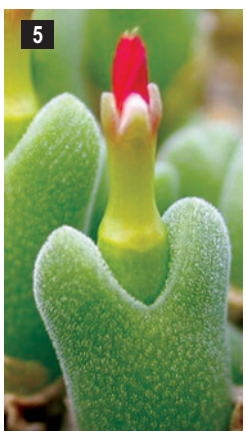
Judd Kirkel Welwitch



François Hoes

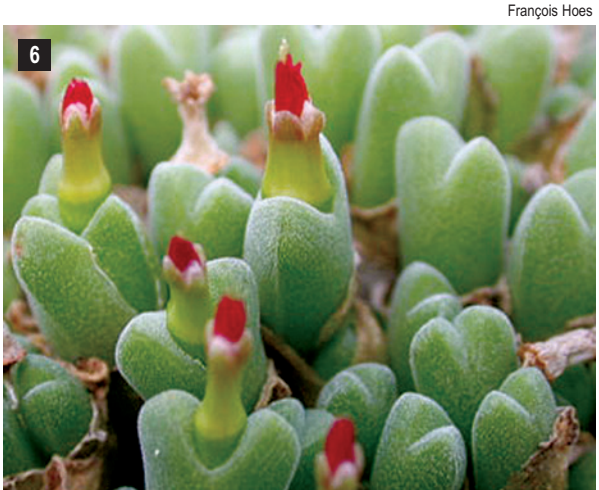


François Hoes



François Hoes

François Hoes





1 & 2. ***Conophytum herreanthus* subsp. *herreanthus*** (1) in cultivation
(2) In habitat with *C. obscurum* at Klipbok
3. ***C. herreanthus* subsp. *rex*** in habitat near Klipbok
4 - 6. ***Conophytum hians*** in cultivation, plant from near Kleinzee - yellow flower
(5) In cultivation, plant from Koei, Richtersveld - red flower
(6) In cultivation, a plant from near Kleinzee
7. ***Conophytum jucundum*** in cultivation, a plant from Skimmelberg, WNW of Steinkopf, Richtersveld
8. ***C. jucundum* subsp. *fragile*** in cultivation from Klipbok, E Richtersveld
9. ***C. jucundum* subsp. *ruschii*** in cultivation, from Rosyntjieberg, central Richtersveld National Park
10. ***C. jucundum* subsp. *marlothii*** in cultivation, from Oograbies, W Richtersveld
11. ***C. jucundum* subsp. *fragile*** in habitat in E Richtersveld

Conophytum khamiesbergense **(L. Bolus) Schwantes** This odd species is so radically different from the conventional *Conophytum* that it was originally described as *Berrisfordia khamiesbergensis*. It forms mats or domes of longish obconical bodies up to about 20 mm long. The lobes are fused only partially, they are laterally flattened with an acute terminal keel. The fissure is gaping. Although not papillate they have some pustules and the apices are somewhat horny. The colour is grey-green to reddish, rarely purple. The flowers occur in late winter to early spring, and are diurnal - opening in the morning and are highly-scented. They are whitish-pink to mauve.

Distribution: Occurs on the higher elevations of the central K[h]amiesberge on the gneiss domes.





Conophytum khamiesbergensis
Top: in habitat near Khamieskroon, W Cape.
Above: in cultivation, from near Khamieskroon
Photos François Hoes

Conophytum limpidum **S.A. Hammer** This species was one of the number of *Conophytum* species which were transferred from *Ophthalmophyllum*. It is proliferous, cluster-forming, producing bodies of as many as about 200 soft green heads. The two leaves are separated by a wide fissure. The apices are translucent, without markings, except at the edges, where they break up into dots. The flowers, which are white to deep pink, are diurnal, autumnal and are slightly to heavily-scented.

Distribution: Occurs in a relatively small area from Pellaberg to W of Pofadder, where it is extremely prolific on the Gamsberg and the Namiesberg.

Conophytum lithopsoides **L. Bolus** Forms compact and tight groups of up to about 20 heads. The bodies are obovate-cylindric with the apices convex and rarely truncate. The fissure extends over half the apex and the epidermis is densely but finely papillate. The apices are translucent with some islands and with some translucent dots on the sides. The flowers are early autumnal, diurnal and are scentless, their colour is magenta, sometimes bicoloured with yellow or white centres.

Distribution: Occurs E of Springbok, around Smorenskadu and Kangnas.

Conophytum loeschianum **Tischer** This species forms dense mats or domes of sharp keeled and margins, ovate-cuneate little bodies up to about 12 mm wide. The fissure is an acute-edged notch in the apex of the body. The keels and fissure are marked in reddish-purple. The flowers are scentless, diurnal and open in autumn.

Distribution: Occurs from near Concordia, N to Kon'Kyp and NE to Umdaus. Common on the Eenriet Koppies N of Steinkopf.

Conophytum luckhoffii **Lavis** *Conophytum luckhoffii* is a highly variable species which forms dense mats, with the little bodies growing up to about 35 mm long. These little green bodies are beautifully marked with a cross-hatch of red to purple lines atop all ridges and dots. The sunken fissure is ringed with purple. The flowers are magenta to carmine and are rarely white. They are diurnal, scentless and are autumnal.



Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



François Hoes



François Hoes

1 - 3. *Conophytum limpidum* (1) in habitat at Aggeneys, W of Pofadder
(2 & 3) In cultivation, from near Pofadder
4. ***Conophytum lithopsoides*** in cultivation from Smorenskadu, E of Pofadder
5 & 6. ***Conophytum loeschianum*** (5) in habitat on Helshoogte, Richtersveld National Park
(6) in cultivation from De Koei, W Richtersveld National Park
7 & 8. ***Conophytum luckhoffii*** (7) in cultivation, from near Elands Bay W Cape. (8) in cultivation, from near Nieuwoudtville



François Hoes



François Hoes



François Hoes

Robin Frandsen



Distribution: Occurs at many points between Citrusdal and Clanwilliam, S to Citrusdal, N to the Nieuwoudtville Plateau and to near Elandsbaai on the coast.

Conophytum marginatum **Lavis** This is a beautiful species which forms dense caespitose mats of as many as about 100 heads, up to 200 for subsp. *haramoepense*. Three subspecies are recorded: *marginatum, haramoepense* and *littlewoodii*. The last-mentioned was collected once and has not resurfaced. The little bodies are up to about 30 mm long. They are obcordate with a deep, wide fissure. The margins are rounded or sharply keeled. Their colour is green with pellucid dots and reddish-to purplish on the keels and margins. In *haramoepense* the lobes are short and slightly incurved. The dots are prominently dark and the keel and margins are often with dark reddish lines. When going into dormancy the tips of the lobes turn a dark purple. The flowers are magenta to carmine, rarely pale rose. They are diurnal, slightly scented and open mid-autumn.

Distribution: The subspecies *marginatum* occurs between Concordia and Smorenskadu, E of Springbok to about 50 km NE of Concordia, where it is replaced by *haramoepense* which reaches as far E as the Gamsberg and Pofadder. It favours quartz.

Conophytum meyeri **N.E. Br.** This is a caespitose or mat-forming species which clumps into many globose, sometimes slightly keeled, dull green or yellowish-green bodies. The small fissure is sometimes ringed with darker green or reddish-green. The epidermis is glaucous or velvety. They are usually unmarked but sometimes have a few spots. The flowers are yellow, are diurnal und unscented.

Distribution: Fairly common in suitable rocky habitat in the NW Cape from Kleinzee in the SW to the hilly regions of W Richtersveld National Park.

Conophytum minimum **(Haw.) N.E. Br.** This is a caespitose species which forms mats or compact domes. The bodies are obconic, truncate or slightly convex. The epidermis is glabrous or slightly papillate. The colour is green, becoming brownish buff in harsh sun, but never glossy. They are marked with longitudinal lines or dotted, sometimes heavily marked and striking. The flowers are white, heavily scented and nocturnal.

Distribution: Occurs mainly in the N Little Karoo, the Witteberg range, W of Matjiesfontein, Laingsburg and narrowly into the S Ceres Karoo.

Conophytum minusculum **(N.E. Br.) N.E. Br.** This is a very variable and tiny species with three subspecies represented here. The bodies are small brownish-green on the sides and purplish towards the apex, form dense mats and are glossy and are often beautifully marked with prominent lines and dots. The bodies are cylindric to obovate, with the apices convex and mildly keeled near the tiny fissure. Flowers are autumnal, diurnal and scentless. They are striking and magenta to carmine, rarely white. The subspecies *leipoldtii* varies in being papillate, with a translucent band around the fissure, with yellow flowers. The subspecies *aestiflorens* is smaller with very small glabrous bodies, forming mats. Tops are convex sometimes with keels. Colour is greyish- to brownish-green, spotted and striated. Flowers are yellow inside, paler and fawn-coloured on the outside. Flowering time differs from the other two subspecies: mid-summer, diurnal and they are scentless.

Distribution: Occurs on Table Mountain sandstone from Citrusdal in the S to W of Nieuwoudtville and across to Graafwater. S & E of Clanwilliam one finds subsp. *leipoldtii* to as far W as Wupperthal. The subspecies *aestiflorens* is found well S in between the Skitterykloof and the Skurweberg.

Conophytum meyeri Left: in habitat near Lekkersing, Richtersveld. Right: In habitat east of Port Nolloth. Photos Gerhard Beukes



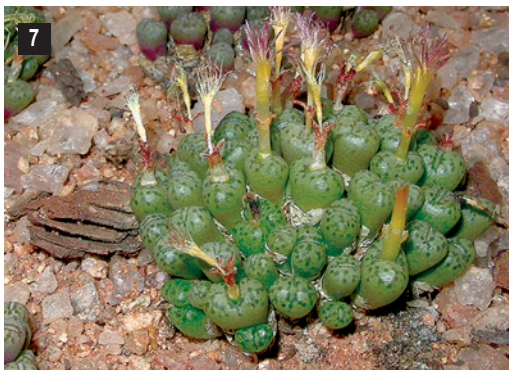




François Hoes



Robin Frandsen



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch



François Hoes



François Hoes



François Hoes



François Hoes

1 & 2. ***Conophytum marginatum*** (1) in cultivation from Khubusberge, Richtersveld
(2) In habitat E of Springbok
3 - 5. ***C. marginatum* subsp. *haramoepense*** (3) in cultivation W of Pofadder.
(4) In habitat on the Gamsberg, E of Pofadder
(5) In habitat with *Crassula sericea* var. *hottentotta* E of Pofadder
6 & 7. ***Conophytum minimum*** (6) in habitat N of Matjiesfontein
(7) In habitat NW of Matjiesfontein
8 & 9. ***Conophytum minisculum*** (8) in cultivation, from the Gifberg, SE of Vanrynsdorp.
(9) In cultivation, from Moutonsberg, SW of Nieuwoudtville.
10 & 11. ***C. minisculum* var. *aestiflorens*** in cultivation from Katbakkies, W of Skitterykloof.
12 & 13. ***C. minisculum* var. *leipoldtii***
(12) in cultivation from Wupperthal - note the very hairy epidermis of plants from the E region.
(13) In cultivation from W of Clanwilliam



François Hoes

Robin Frandsen

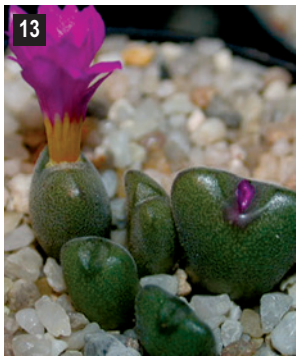


Judd Kirkel





François Hoes



Conophytum minutum **(Haw.) N.E. Br.** This is a compact or lax, tuft-forming species, The bodies are slightly convex to flattish with a short fissure. Flowers are autumnal, diurnal and scentless. Two varieties are discussed here: *minutum* and *pearsonii*. The former is blue-green to grey-green, glabrous, rarely papillate, sparsely or well-dotted. Flowers are on a long corolla-tube, are pink, magenta and rarely white. The variety *pearsonii* forms dense cushions with overlapping bodies. These are obconic with over-hanging margins. Their colour is green to brownish undotted or with dots. The flowers have a long corolla-tube and are pink or magenta, sometimes white inside.

Distribution: The variety *minutum* is widespread across the Knersvlakte, from near the coast at Papendorp, E to beyond Vanrhynsdorp and N to Gamoep. The variety *pearsonii* occurs from central Knersvlakte to near Bitterfontein.





Conophytum minutum **subsp. *minutum***
Left: in habitat in the central Knersvlakte in association with *C. subfenestratum*
Photo Robin Frandsen
Above: in cultivation, from Quaggaskop, central Knersvlakte.
minutum **subsp. *pearsonii*** Below left: in habitat in central Knersvlakte
Photos Priscilla Burgoyne SANBI
Below: in habitat in N Knersvlakte
Photo Robin Frandsen





Conophytum obcordellum **(Haw.) N.E. Br.** This species is a complicated complex with many variations of markings to which various names have been given—such as *'ursprungianum', 'picturatum', 'declinatum' 'spectabile'* and *'stayneri'*. It is certainly one of the more spectacular of the genus. The four recorded taxa are discussed here: subsp. *obcordellum,* subsp. *obcordellum* var. *ceresianum*, subsp. *rolfii* and subsp. *stenandrum.* All are variably caespitose and form dense cushions or mats, with papillate fissures. The flowers are autumnal, nocturnal and strongly-scented. The subspecies *obcordellum* is truncate, obconical, convex or concave. The epidermis is glabrous, dull or shining, yellowish-green, grass-green, bluish-green to silvery-green, usually strikingly marked with slightly raised blue-green lines and dots, which do not extend down the sides. Flowers are white, to yellow-ish to pink. *C. obcordellum* subsp *obcordellum* var. *ceresianum* is glabrous, the bodies are obconic to truncate with the fissure short, pale-green to reddish-purple, covered with purple dots and lines, spreading over the edge. The flowers are whitish, through pink to dark cerise. The bodies of subsp. *rolfii* almost resemble the bilobe shape of *C. bilobum*. The fissure is wider, occasionally extending right across. The colour is silvery grey to shiny-green with prominent raised longitudinal lines, and a central prominent keel, extending shortly over the sides. The flowers are white to pink, sometimes with red tips. The bodies of subsp. *stenandrum* are convex with a short fissure. Their colour is silvery pale green to greeny-grey, liberally marked with reddish or green raised splotches. Flowers are shiny-white.

Distribution: The subspecies *obcordellum* inhabits the sandstones of the Cedarberg massif from Citrusdal, as far N as Klawer, and on the Matsikamma mountains and onto the Nieuwoudtville plateau. The variety *ceresianum* occurs on

François Hoes





François Hoes



François Hoes



François Hoes



François Hoes



François Hoes

1 & 2. ***Conophytum obcordellum*** **subsp. *obcordellum*** (1) in cultivation, from the Gifberg, SW of Vanrynsdorp.
(2) In habitat on the Matsikamma Mountain, E of Vanrynsdorp
3. ***C. obcordellum*** **subsp. *obcordellum* '*spectabile*'** in cultivation from mear Karoopoort
4. ***C. obcordellum*** **subsp. *obcordellum* '*ursprungianum*'** in cultivation at Lokenberg, S of Loeriesfontein
5. ***C. obcordellum*** **subsp. *obcordellum* '*picturatum*'** in cultivation, from near Clanwilliam
6. ***C. obcordellum*** **subsp. *stenandrum*** in cultivation, from S of Garies
7. ***C. obcordellum*** **subsp. *obcordellum* var.*ceresianum* ' *stayneri*'** in cultivation, from N of Garies
8 & 9. ***C. obcordellum*** **subsp. *obcordellum* var. *ceresianum*** (8) in cultivation from Karoopoort
(9) In cultivation from Katbakkies
10. ***C. obcordellum*** **subsp. *obcordellum* '*declinatum*'** in habitat at the Doorn River, S of Nieuwoudtville
11 & 12. ***C. obcordellum*** **subsp. *rolfii*** in cultivation, from Elands Bay



Robin Frandsen

François Hoes



François Hoes



François Hoes



François Hoes



François Hoes



François Hoes

the sandstone hills from Karoopoort in the S to the Skitterykloof and Katbakkies. The subspecies *rolfii* is found near and around Elands Bay on sandstone ridges and subsp. *stenandrum* occurs in grit pans and mosses, from Bitterfontein to the N sections of the Knersvlakte.

***Conophytum obscurum* N.E. Br.** This species comprises four subspecies: All four are represented here and these are *obscurum, barbatum, sponsaliorum* and *vitreopappilum.* The plants are caespitose, sometimes densely packed and sometimes loose. The plants are glabrous, except for the fissure, which is papillate. The fissure is short and not gaping and often ringed with red. Flowers are autumnal, diurnal and scentless. The bodies of subsp. *obscurum* are truncate to concave. They are glabrous, bright to dark green, suffused with purplish-brown in strong sunlight with sparse translucent dots. Flowers are whitish or dark magenta. The subspecies *barbatum* differs in the unspotted epidermis, with reddish sides and is covered with fine whitish papillae on the apex only. Flowers are reddish-purple. The subspecies *sponsoliorum* forms tight mats, with the bodies truncate to concave with the edges somewhat raised. The surface is mottled whitish-green with a few green spots and sometimes with a few reddish streaks. The flowers are reddish-purple. The subspecies *vitreo-pappilum* forms compact clumps, with convex, to slightly concave tops. The 'glassy' epidermis is dark-green, unspotted, without red streaks. The flowers are whitish, pinkish or magenta.

Distribution: These are quartzicola plants: subsp. *obscurum* occurs from Oograbies in the SW Richtersveld, N to near the Orange River and across to W Bushmanland; subsp. *barbatum* occurs on the E slopes of the Oograbies; subsp. *sponsialarum* on the E slopes of the Skimmelberg, S central Richtersveld; subsp. *vitreopappilum* occurs around Riethuis, NW of Kamieskroon and on the Harrasberg, W of Steinkopf.

***Conophytum pageae* (N.E. Br..) N.E. Br.** This small globular species forms dense mats or cushions. The bodies are small, usually about 15 mm in diameter but may be up to 30 mm. They are glabrous, pale green and somewhat flattened at the top. The reddened fissure, which is sometimes dimpled, and reddened sides are characteristic, although sometimes absent. It flowers at night, is autumnal and is strongly-scented. Flowers are whitish or yellow, rarely pinkish.

Distribution One of the most widespread of the genus: from the S Knersvlakte, to S of Calvinia in the Tanqua Karoo, and N to S of Aus to as far NW as Lüderitz in Namibia.

***Conophytum pellucidum* Schwantes** This is a very variable species with a number of subspecies and varieties, three of which are represented here: subsp. *pellicidum* var. *pellucidum,* subsp. *pellicidum* var. *neohallii and subsp. pellicidum* var. *terricolor*,. The plants have beautiful markings and the flowers are


9

François Hoes


10

François Hoes


11

Darrel Plowes

François Hoes


12



François Hoes



Robin Frandsen



Priscilla Burgoyne SANBI



François Hoes



François Hoes



François Hoes



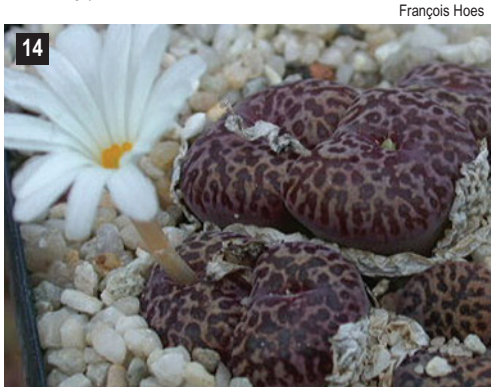
Priscilla Burgoyne SANBI

François Hoes



François Hoes

François Hoes





1 & 2. *Conophytum obscurum* subsp. *obscurum*
(1) in cultivation, from Umdaus, NW of Steinkopf. (2) In cultivation, from Oograbies, E of Port Nolloth
3 & 4. *C. obscurum* subsp. *sponsaliorum* (3) in cultivation, from Harras, WSW of Steinkopf. (4) In cultivation, from Skimmelberg, WNW of Steinkopf
5. *C. obscurum* subsp. *vitreopappilum* in cultivation, from Riethuis, NW of Hondeklip Bay
6 - 8. *Conophytum pageae* (6) in habitat just E of Anenous Pass, W of Steinkopf. (7) In habitat near Kommagas, E of Springbok . (8) In cultivation, from Tweefontein, near Kamieskroon
9 - 11. *Conophytum pellucidum* subsp. *pellucidum* (9) on the Kamiesberg. (10) Pink form, in cultivation, from Grootberg, NW Cape. (11) In habitat
12 & 13. *C. pellucidum* subsp. *pellucidum* var. *terricolor*
(12) (Makin's Plum) in cultivation, from Mesklip, S of Springbok. (13) In habitat at Wildeperdehoek Pass, SW of Komaggas
14. *C. pellucidum* subsp. *pellucidum* var. *neohallii*
in cultivation from Deur Drift, SE of Springbok

spectacular. The plants form sparse to dense cushions which are sometimes partially sunken. The bodies are papillate and are dull to glossy. Flowers appear late summer to autumn. They are scentless and diurnal. The variety *terricolor* is densely caespitose, is flattened and pitted on top and the flowers are white. The variety *neohallii* has a pitted surface with numerous spots and has white flowers.

Distribution: The complex is common on rocky hills in the region, between Steinkopf in the N, Garies in the S, NW of Hondeklip Bay in the W and W of Loeriesfontein in the E; *pellucidum* occurs over the entire region; *terricolor* occurs W. N and NW of Springbok; *neohallii* occurs SE of Springbok.

Conophytum phoeniceum **S.A. Hammer** This dwarf species is mainly subterranean, rarely twinned. The height of growth is barely 10 mm. The epidermis is densely covered with crystalline papillae and the apex has a curious cruciform windowed area. In nature the colour is yellowish-green. The flowers are early autumnal, nocturnal and strongly scented.

Distribution: Known only from a single colony in quartz-pebbles near Umdaus, NWN of Steinkopf.

Conophytum praesectum **N.E. Br.** This species is readily identifiable by its brown colour, its clustering habit and locality. The plants form clusters of up to about 12 bodies. The apex has well-defined brownish, purplish to pale green, mat windows. The fissure is wide with the bodies quite bilobed. The showy flowers are autumnal, diurnal and scented and are sometimes paired. Their colour is pink through to magenta and rarely white.

Distribution: occurs on granitic ridges, from Pofadder to Namiesberg in the SW and for about 30 km to the W.

Conophytum praesectum in habitat near Pofadder, Bushmanland
Photos Priscilla Burgoyne SANBI





Conophytum pubicalyx **Lavis** This is a minute-bodied, clustering species, forming tight, flattish to caespitose clumps of hairy ovoid, dark-green to purplish-green bodies, with short depressed fissures ringed with a narrow blackish translucent window. It is reminiscent of *C. stephanii* but is considerably smaller. The flowers are late autumnal, nocturnal and strongly-scented. Their colour is orange to red.

Distribution: Occurs N & NW of Kliprand, extending to S of Gamoep, favouring quartz-pebble fields.

Conophytum quaesitum **(N.E. Br.) N.E. Br.** This species has three taxa: subsp. *quaesitum,* subsp. *quaesitum* var. *rostratum* and subsp. *densipunctatum*. The latter two are represented here. The plants are recognised by the chalky, greyish, pale colour of the leaf-bodies, sometimes with purplish markings on the keels. They are densely caespitose, acutely keeled to rounded leaf-bodies. They are nocturnal, heavily-scented and autumn-flowering and the flowers are white, with var. *rostratum* sometimes producing pale yellow-white flowers. The variety *rostratum* is very similar to subsp. *quaesitum*, the difference lies almost solely on the longer, somewhat 'beaked' lobes. Given the extreme variability of the species, I find the creation of this variety somewhat suspect. The subspecies *densipunctatum* varies in having dense and even spotting over the surface.

Distribution: The subspecies *quaesitum* and var. *rostratum* occurs in N Richtersveld and in S Namibia N of the Orange River. The subspecies *densipunctatum* occurs 20—40 km NW of Grünau in S Namibia.

Conophytum ratum **Rawé** This species is single, rarely up to 3 bodies, almost subterranean, plants somewhat obese-globose with a short fissure about 40 mm wide, which is lined with a few scattered trichomes. The colour is green to yellowish-green with a darker, almost obscure trans-lucent window. The flowers are white to pale pink, are diurnal, lightly-scented and early autumnal.

Distribution: Around and on top of the Gamsberg, W of Pofadder. Favours the quartz fields.

Conophytum reconditum **A.R. Mitchell** This strange dwarf species forms caespitose mats of many tiny heads, The odd leaf-pairs are hardly united and divergent. The epidermis is dull with shiny dense warts and almost



François Hoes



François Hoes



François Hoes



François Hoes

1 & 2. ***Conophytum phoeniceum*** in cultivation from Umdaus, NW of Steinkopf. Note the typical form of night-flowers of the genus.
3 & 4. ***Conophytum pubicalyx*** in habitat at Banke, NW of Loeriesfontein
5.***Conophytum quaesitum* subsp. *densipunctatum*** in habitat S of the Orange River, Richtersveld National Park
6. ***C. quaesitum subsp.* quaesitum *var. rostratum*** in habitat NW of Grünau, S Namibia
7. ***Conophytum reconditum*** in cultivation
8, ***Conophytum ratum*** In cultivation from S of Gamsberg, near Pofadder

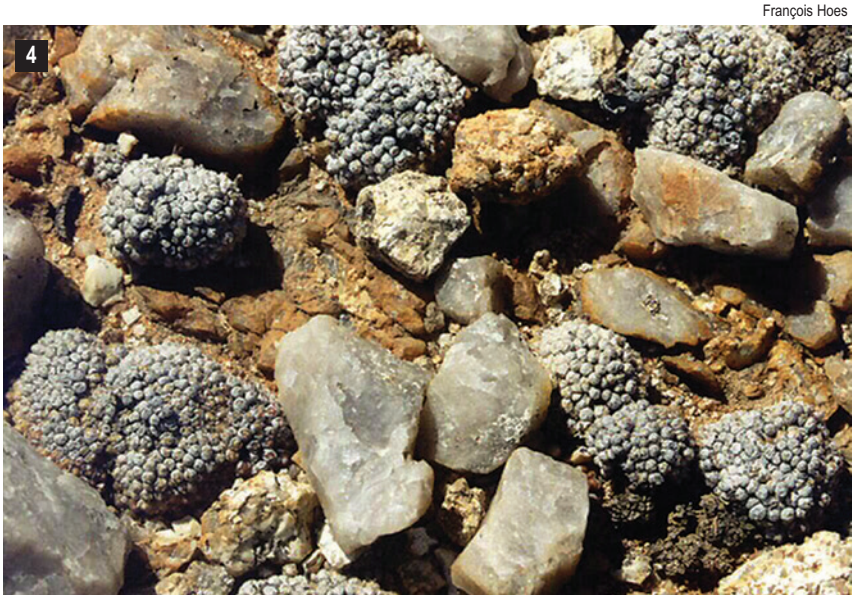


François Hoes

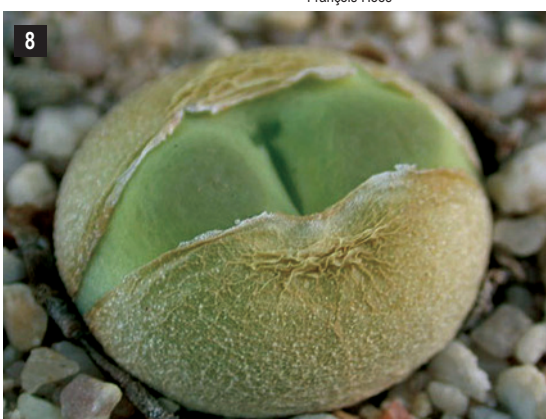


François Hoes

François Hoes



François Hoes



triangular in cross-section. They are somewhat truncate when turgid, greenish to yellowish-green with reddish sides. The flowers are usually pure white, but are sometimes palest yellow. They are diurnal, occur from early summer into early autumn and are scentless.

Distribution: Occur from Kliprand in the SE to well N of Garies in the NW.

CONOPHYTUM REGALE **Lavis** This striking and unmistakable species forms mats of large plant-bodies, which are up to about 50 mm long. The bodies are strongly keeled, reddened along the keel and bilobed for about ½ their length. The lobes are concave on one side with a prominent pustulate window at the base of the fissure. The epidermis is rough, greenish to yellowish-green, densely papillate and velvety. The pinkish flowers with a white throat are autumnal, opening in the late afternoon and are strongly-scented.

Distribution: Located along the top of the Ratelpoort Koppie, about 40 km N of Springbok.

CONOPHYTUM ROODIAE **N.E. Br.** This is a species with a number of subspecies of which only the nominate species is represented here. The plants are caespitose and, in nature, produce very many heads, filling rock crevices. The small bodies are waxy green in appearance, shortly bilobed, cylindric to somewhat laterally flattened. The epidermis is glabrous, shiny-green, greyish-green to purplish-green and covered with many pellucid spots. The flowers are white, sometimes pinkish and sometimes with a reddish streak. They are diurnal and scentless, opening in autumn.

Distribution: Occurs E and S of Springbok on the rocky hillocks. The complex is endemic to the area between Springbok and Garies.

CONOPHYTUM SAXETANUM **(N.E. Br.) N.E. Br.** This species has tiny, torpedo-shaped glaucous green bodies, which multiply into very many, to form large caespitose, sometimes very irregular clumps. The bodies are somewhat featureless, but with age are sub-bilobed with some reddish markings. The flowers are late autumnal, nocturnal and vaguely scented. They are whitish, creamy-white, pinkish-orange and rarely violet.

Distribution: Occurs in a band from N of Port Nolloth, along the coast to Lüderitz in Namibia and inland for roughly about 40 km.

CONOPHYTUM SCHLECHTERI **Schwantes** This species forms flattish cushions. The bodies are obconic, often skewed with the fissure excentrically-placed which is surrounded by a translucent ring. They are covered with small dots and sometimes with red linear markings. The epidermis is deep-green, glabrous, smooth and shiny. The flowers are autumnal, diurnal and scentless. Their colour is white or pale yellow.

Distribution: Inhabits deep crevices in quartz outcrops on ridges E of Port Nolloth.

CONOPHYTUM SMORENSKUDUENSE **de Boer** This is a dwarf, soft, usually solitary species sometimes branching with age, which is no more than 40 mm in diameter. The bodies are somewhat obconic to almost longitudinally oval in shape, the epidermis is green to yellowish-green and is nearly glabrous with the fissure minutely papillate and covered with translucent dots. The flowers occur in mid-winter. They are diurnal and scentless and their colour is bright magenta with a white or yellow throat.

Distribution: Occurs at a single small hillock on the farm Smorenskadu, E of Springbok.

CONOPHYTUM STEPHANII **Schwantes** this is a dwarf, hairy species, with small ovate bodies and a short fissure. It forms largish mats on the most unlikely fissures and rock faces. The small dark-green to yellowish bodies are densely covered with translucent papillae and are tightly packed. There are two subspecies: *stephanii* and *helmutii*. The latter has larger bodies which are somewhat truncate at the apex, the bodies are green or reddish. The flowers are autumnal, nocturnal and strongly scented. The subspecies *stephanii* has white to yellow, pale pink or rarely lilac flowers, whereas the flowers of subsp. *helmutii* are brownish-yellow, through to deep cerise.

Distribution: The subspecies *stephanii* is confined to the E slopes of the Oograbies Mountains, E of Port Nolloth, often in deep shade, where in their limited range, they are very plentiful. The subspecies *helmutii* occupies the quartz ridges, which are subject to heavy fogs, of the central Richtersveld.



François Hoes



Robin Frandsen



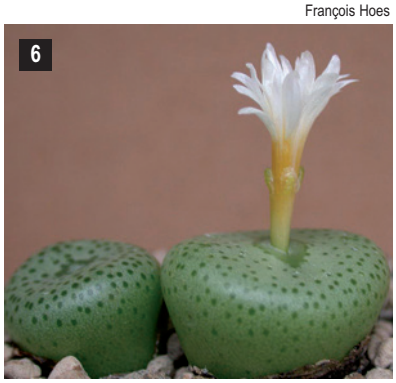
François Hoes

1. ***Conophytum regale*** in cultivation from Ratelpoort, N of Springbok
2. ***Conophytum roodiae*** in cultivation from Mesklip,S of Springbok
3 - 5. ***Conophytum saxetanum*** (3) in habitat at Holgat, N of Port Nolloth. (4) In cultivation from Chamies (Chamais), Sperrgebiet, approx. equidistant between Alexander Bay and Lüderitz. (5) In habitat N of Lüderitz, very red in dormancy in the northern populations
6. ***Conophytum schlecteri*** in cultivation from Farquarson's Kop, W of Anenous Pass
7. ***Conophytum smorenskaduense*** in cultivation from Smorenskadu, E of Springbok
8 & 9. ***Conophytum stephanii*** **subsp.** ***stephanii*** (8) in habitat in deep shade in the Oograbies Mountains, E of Port Nolloth (9) In habitat at Oograbies Mountains
10. ***C. stephanii*** **subsp.** ***helmutii*** from Rosyntjieberg, Richtersveld Nat. Park



François Hoes

François Hoes



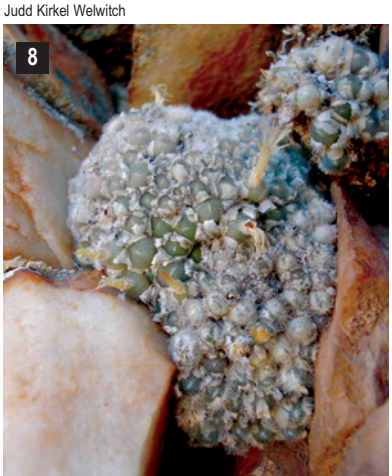
Judd Kirkel Welwitch



François Hoes

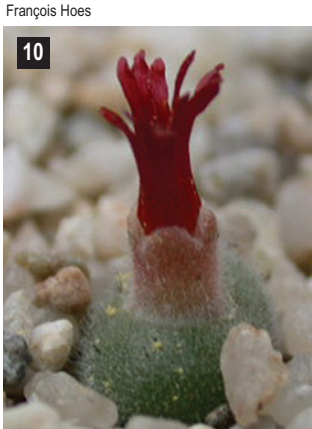


Robin Frandsen





François Hoes



François Hoes

Conophytum subfenestratum **Schwantes** This has usually a single obconic body, up to about 25 mm in diameter, rarely more, with a concave to slightly convex upper surface. The upper surface is afenestrated caused by the heavy occlusion of translucent dots, which fade abruptly towards the unmarked sides. The colour is pale green to yellowish-green changing to reddish when approaching dormancy. The flowers are diurnal, slightly-scented, pink to magenta, with a paler centre, rarely white. Sometimes producing 2 or even 3 flowers at a time.

Distribution: Fairly widespread across the quartz fields of the Knersvlakte. from S of Bitterfontein to just N of Vanrhynsdorp.

Conophytum swanepoelianum **Rawe** Three subspecies are recognised in the species: *swanepoelianum, proliferans* and *rubrolineatum.* This is a dwarf species which forms mats, or domes of very many heads; up to about 200 in *proliferans* and up to about 50 in the other two. The subspecies *swanepoelianum* has dark green to blackish-coloured truncate lobes which are ridged with darker sub-linear marking and dots. Flowers are pale-magenta. The subspecies *proliferans* is dull greyish-brown and has convex apices with indistinct markings. Its main difference is the large number of bodies in a clump. Flowers are reddish to magenta with a whitish base. The subspecies *rubrolineatum* has larger bodies. The colour is green with raised reddish ridges which radiate outwards. Flowers are pale pink with whitish insides. Flowers are mid-autumnal, diurnal and scentless.

Distribution: The subspecies *swanepoelianum* is known from SE of Nieuwoudtville. The subspecies *proliferans* occurs on the Van Rhyns Pass escarpment, S of the pass, in silt pans or moss-covered rockfaces and crevices. The subspecies *rubroliniatum* occurs on the Kobeeberg escarpment, some 40 km SE of Vanrhynsdorp in moss on sheets of sandstone and in silt-filled rock depressions, often in lichen and moss.

Conophytum tantillum **N.E. Br.** This species forms small cushions of glossy plants with well-defined keels. All subspecies are strongly-marked and have disproportionally large flowers. Five subspecies are shown here: *eenkokerense, heleniae, inexpectatum lindenianum* and *tantillum*. There is little to define the differences and the complex is probably in need of revision. Colour of the bodies in habitat seems to be the deciding factor. The subspecies *inexpectatum* however has yellow flowers and the others have pink, white or magenta flowers. The flowers are autumnal, diurnal and scentless.

Distribution: The subspecies *tantillum* is reported from W of Gamoep and possibly occurs on the Steinkopf Plateau, which is still to be confirmed. The subspecies *eenkokerense* occurs NE of Steinkopf. The subspecies *heleniae* occurs near Kosies, W of Umdaus. The subspecies *inexpectatum* occurs in a small area N of Umdaus. The subspecies *lindenianum* occurs at Kliphuisbank, W of Springbok.

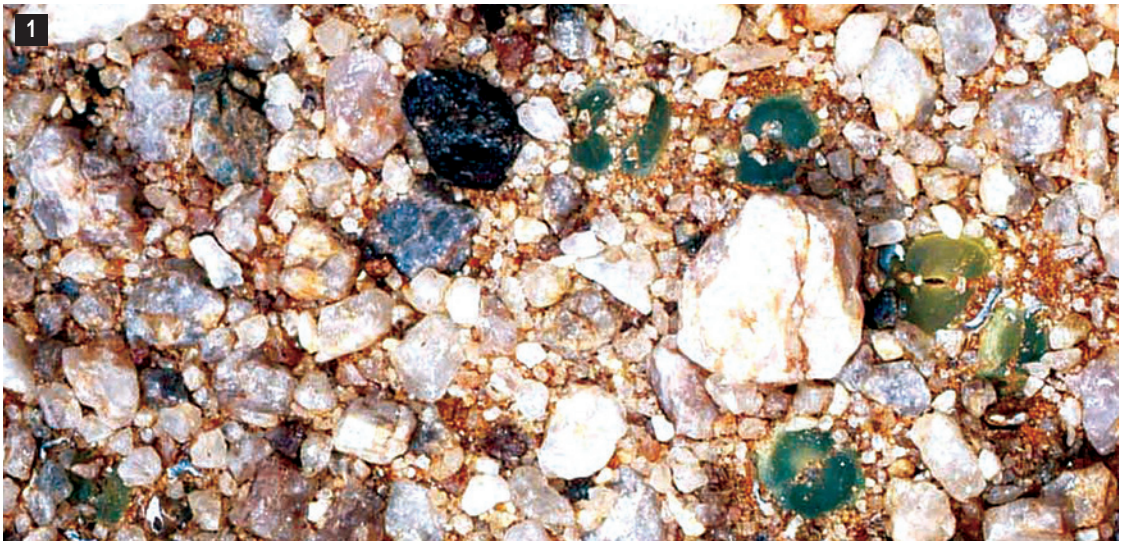
Conophytum taylorianum **(Dinter & Schwantes) N.E. Br.** This is a robust species which forms dense, caespitose clumps of many bodies. Three subspecies are recognised. These are distinguished in their shape and texture and two are included here. The subspecies *ernianum* is a relatively large, strongly bilobed species laterally flattened and strongly keeled. The epidermis is glabrous or very shortly papillate. The colour is green to pale yellowish, sometimes with reddish markings on the keels and covered with large green idioblasts. The bodies of subsp. *rosynense* are laterally compressed with the lobes often unequal. They are densely and finely papillate and spotted with large green or purple idioblasts. The flowers of subsp. *rosynense* appear

12 & 13. ***Conophytum taylorianum*** **subsp. *rosynense*** in cultivation from the Rosyntjieberg, Richtersveld National Park
14. ***taylorianum*** **subsp. *ernianum*** in habitat in S Namibia
Photos François Hoes









Robin Frandsen



François Hoes



Robin Frandsen



Darrel Plowes

1 - 3. ***Conophytum subfenestratum*** in habitat in central Knersvlakte
4 & 5. ***Conophytum swanepoelianum*** (4) in cultivation from Lokenburg, SW of Nieuwoudtville
(5) In cultivation from Oorlogskloof, S of Nieuwoudtville
6. ***C. swanepoelianum* subsp. *rubrolineatum*** in habitat near Nieuwoudtville
7. ***C. swanepoelianum* subsp. *proliferans*** in cultivation from N of the Vanrhyns Pass
8. ***Conophytum tantillum* subsp. *eenkokerense*** in cultivation from NE of Springbok
9. ***C. tantillum* subp. *heleniae*** in cultivation from W of Umdaus
10. ***C. tantillum* subsp. *lindenianum*** in cultivation from Kliphuisbank, 50 km W of Springbok
11. ***C. tantillum* subsp. *inexpectatum*** in cultivation from N of Umdaus



François Hoes



François Hoes

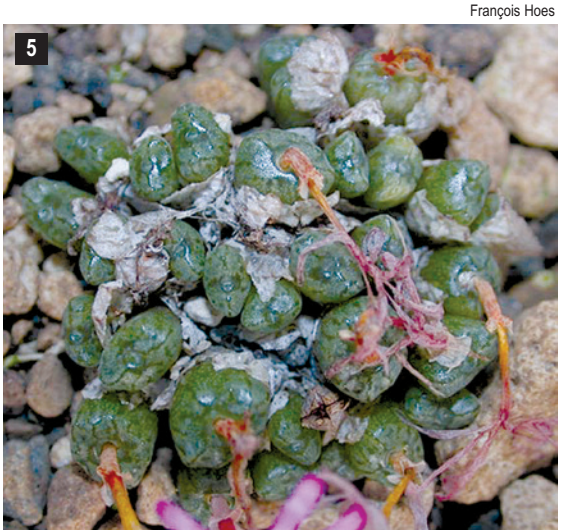


Priscilla Burgoyne SANBI



François Hoes

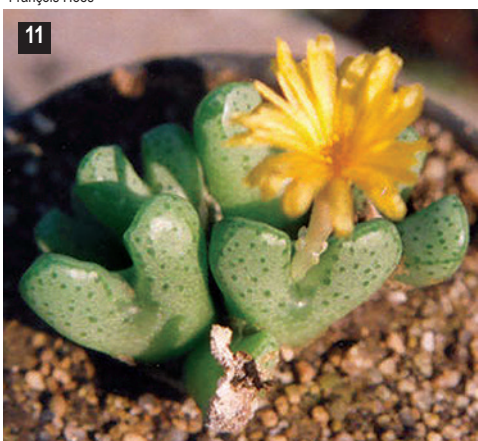
François Hoes



François Hoes



François Hoes



in early summer, are diurnal, opening towards midday and are lightly-scented. Their colour is rosy-magenta with white bases. The flowers of subsp. *ernianum* open in autumn, are diurnal and lightly-scented.

Distribution: The subspecies *erniarnum* occurs in S Namibia around Witputs and S to Rosh Pinah. The subspecies *rosynense* occurs in the N Richtersveld National Park.

CONOPHYTUM TRUNCATUM **(Thunb.) N.E. Br.** This species varies greatly in its degree of truncation. There are two subspecies and these are: *truncatum, truncatum* var. *wiggettiae* and *viridicatum*. The little bodies are obconical with the apices flattish to usually somewhat rounded. They are glabrous and spotted, rarely lined. The subspecies *truncatum* is a compact cushion which is whitish-green to reddish in colour and spotted with tanniniferous idioblasts. Occasionally slightly papillate with the fissure always papillate. The subspecies *viridicatum* forms dense mats, the apex is convex and sometimes depressed in the centre and sometimes very obtusely keeled. Their colour is whitish-green to pale beige. The subspecies *truncatum* var. *wiggettiae* forms compact cushions, sometimes in large colonies and large cushions of many diminutive bodies. which are spotted and rounded at the apex. Flowers are mid-autumnal, nocturnal and slightly scented. Their colour is straw-coloured, white to pinkish to salmon.

Distribution: Widely distributed throughout the Little Karoo and the S Great Karoo, from Robertson in the W to as far as Steytlerville in the E. The subspecies *viridicatum* occurs in the W Little Karoo from Robertson through the Warmwaterberg and N to Laingsburg and Koup in the E. The variety *wiggettiae* is found in the red conglomorates from De Rust to Calitzdorp.

CONOPHYTUM TURRIGERUM **(N.E. Br.) N.E. Br.** This species is the closest *Conophytum* to Cape Town. It forms loose clusters of little bodies with two widely divergent lobes, which, in themselves, have up to four obtuse keels which are striped in purple. The rest of the glabrous plant-body has largish translucent spots with an irregular translucent window in and on the sides of the fissure. They flower in late summer to early autumn, are diurnal and scentless and are white to pinkish.

Distribution: Occur on the granitic domes to the E of Cape Town, from Paarl, through to Malmesbury to Riebeek-Kasteel. They inhabit mosses in silty pans and mossy crevices on the granitic domes.

CONOPHYTUM UVIFORME **N.E. Br.** Forms highly caespitose cushions of obconic bodies where the apices are decidedly convex and they are laterally somewhat constricted. Fissures are short and are surrounded by a translucent ring. Markings are somewhat random, but with a tendency to a linear form of dots and lines. The nominate subspecies is the largest, with the greatest distribution. Several subspecies are recorded with subspecies: *decoratum, rauhii* and *uviforme* being featured here. The dull green to greyish and brownish to purplish subspecies *uviforme* has glabrous smooth or slightly rugose heads. The green through ochre to reddish subspecies *decoratum* is glabrous, often glossy. The subspecies *rauhii* has the widest gaping fissure of the species. Its bodies are glabrous, glossy and its colour is green through ochre to reddish-brown, when approaching dormancy. The flowers are autumnal, nocturnal and highly scented. Colours range from white to whitish-yellow through pale pink reddish.

Distribution: Across the Knersvlakte, NE to Loeriesfontein and Calvinia. The subspecies *decoratum* occurs around Bitterfontein and Garies to near Kommagas. The subspecies *rauhii* occurs SE of Springbok and at Koringhuis, which is near Hondeklip Bay.

CONOPHYTUM VANHEERDEI **Tischer** This odd little species forms dense clusters of long to shortish spindle-shaped bodies with a very short fissure. The epidermis is pale yellowish-green and is covered with large translucent pustules which sometimes coalesce near the apex to form an irregular windowed effect. The flowers are autumnal, diurnal and scentless. They are purple in colour.

Distribution: Very narrowly distributed. It occurs about 50 km ENE of Springbok on Kangnaskoppie.

François Hoes





Judd Kirkel Welwitch



Robin Frandsen



François Hoes



Priscilla Burgoyne SANBI

1 & 2. ***Conophytum truncatum* subsp. *truncatum***
(1) in habitat near Calitzdorp, N Little Karoo
(2) In habitat at Seweweekspoort
3. ***C. truncatum* subsp. *viridicatum*** in habitat at Anysberg
4 - 6. ***C. truncatum* subsp. *truncatum* var. *wiggettiae***
in habitat in vast numbers in lichen & shade
between De Rust and Oudtshoorn
7. ***Conophytum turrigerum*** in cultivation from Paarl Mountain
8. ***Conophytum uviforme* subsp. *uviforme*** in cultivation from
near Bitterfontein
9. ***C. uviforme* subsp. *decoratum*** in habitat
NW of Bitterfontein
10. ***C. uviforme* subsp. *rauhii*** in cultivation from Messelpad,
SW of Springbok
11. ***Conophytum vanheerdei*** in cultivation from Kangnaskoppie



François Hoes



Robin Frandsen



Robin Frandsen



François Hoes





François Hoes

Conophytum velutinum **Schwantes** This species forms dense to lax mats with bodies which tend to elongate. The nearly glabrous to fuzzily-papillate green bodies are heart-shaped and keeled or rounded at the apices. The fissure is narrow and surrounded by a ring of confluent papillate pellucid dots, which are scattered across or are absent. The keels may be marked with green lines. The flowers are autumnal, diurnal and scentless, whitish, through pink to deep magenta.

Distribution: Occurs in a limited area around Kommagas W of Springbok.

Conophytum verrucosum **(Lavis) Rowley** This *Lithops*-like species forms small clusters. The bodies are usually nearly level with the ground. The green, pustulate windowed apices are flattened or somewhat convex. The fissure is gaping and sometimes blistered. The colour is brownish to olive-green. The flowers are early-autumnal, diurnal and scented. Their colour is white to palest-pink

Distribution: Occurs at Maans se Pan, E of Gamoep and to NW of Kliprand.





Conophytum verrucosum in habitat at Kaip Road WNW of Springbok
Photo Priscilla Burgoyne SANBI

Conophytum violaciflorum **Schick & Tischer** This species forms dense flat mats in habitat. The cordate body is bilobed, laterally somewhat compressed and keeled. The colour is glabrous and smooth. The colour is greyish-blue to green. The keels are marked with purplish lines and spots. The large flowers are pink, to rose to deep magenta. They are autumnal, diurnal and scentless.

Distribution: This has a very restricted range; on the granite koppies in and around Springbok.



Conophytum violaciflorum in habitat on the central koppie in Springbok
Photo Judd Kirkel Welwitch

Conophytum wettsteinii **(Berger) N.E. Br.** This species forms caespitose clumps of densely-packed, flat-topped, obconic bodies, which are often distorted by their close proximity to their neighbours. The colour is whitish-green and is obscurely spotted with small pellucid dots. Several forms have been allocated names, but are, as yet, not officially described. The flowers are autumnal, diurnal and scentless. They are pale pink to magenta.

Distribution: Best-known from the Steinkopf area and extends into central and E Richtersveld.

Cylindrophyllum Schwantes

This genus comprises tufted plants with short branches. The leaves are incurved, terete, blunt to sharpish at the tips. The large solitary flowers are sometimes darker towards the centre and are borne low down between the leaves.

Cylindrophyllum comptonii **(L.) Schwantes** Plants form mats or tufts of up to about 25 cm in diameter of somewhat incurved, finger-like, greyish, later blackish-green wax-covered leaves. Flowers diurnal, opening at noon and close by evening. They are white to yellowish-straw coloured.

Distribution: From E of Montagu across to Ladismith in the Little Karoo and S to Swellendam.

Cylindrophyllum hallii **L. Bolus** This species forms large clumps, up to about 20 cm tall by about 20 cm or more in diameter. The waxy leaves are greenish-black with purplish tips, finger-like, slightly dorsally flattened and inwardly curved. The flowers are pale yellow.

Distribution: Occurs around Calvinia.



Gerhard Beukes



Judd Kirkel Welwitch



Judd Kirkel Welwitch



François Hoes



Gerhard Beukes



Priscilla Burgoyne SANBI

1 & 2. ***Conophytum velutinum*** (1 & 2) in habitat near Komaggas, W of Springbok
3 - 6. ***Conophytum wettsteinii*** (3) in habitat near Steinkopf. (4) in cultivation. (5) In habitat near Wallekraal, NE of Hondeklip Bay.
(6) In habitat NW of Steinkopf
7. ***Cylindrophyllum comptonii*** in cultivation
8 & 9. ***Cylindrophyllum hallii*** (8) in habitat at Heuningneskop, SW of Calvinia. (9) In cultivation

Bob Chinnock





Priscilla Burgoyne SANBI

Priscilla Burgoyne SANBI



Cylindrophyllum tugwelliae **L. Bolus** This is a larger species, with tufts attaining about 60 cm in diameter. The uncurved, waxy leaves are finger-like and somewhat sharp at the tips. Their colour is greyish-green with reddish tips. The flowers are whitish, to flesh-coloured to pinkish.

Distribution: Occurs from Laingsburg to Prince Albert and S to Riversdale.

Dactylopsis N.E. Br.

There are two recorded taxa of this genus, both of which are confined to the Knersvlakte. The subspecies, *digitata*, is the more widespread and locally abundant. Gerbaulet (1997) includes *Dactylopsis* in the genus *Phyllobolus*. We believe that the premises upon which this decision was based ignored too many important characteristics, such as the smooth epidermis, the lack of conspicuous water cells and differing seed characters. We have therefore rejected this transfer, as well as the reduction of *D. littlewoodii* as a subspecies.

Dactylopsis digitata **L. Bolus** Plants glabrous leaf succulents, branching at the base, with short stems forming semi-globose tufts from a tuberous rooted base. Branches short and completely covered by old leaf sheaths. Leaves 2—3 in active growth, dissimilar, alternate; the older the largest, withering during the summer forming a protective grey-white sheath completely covering the new leaf pair. The older withered silvery-grey papery leaves persistent, forming a dense cover around the base of the young leaf and stem. Leaves ascending, softly succulent (salty to the taste), green, terete. Flowers are white, terminal, solitary, sessile appearing during mid-summer and remaining open for up to three weeks.

Distribution: This species more-or-less coincides with the distribution of that of the species of the genus *Argyroderma*. The southernmost occurrence being near to Vanrhynsdorp, across to Vredendal and the northernmost being near Bitterfontein.

Dactylopsis littlewoodii **L. Bolus** This curious little species with its thumb-like leaves, like *D. digitata,* grows in dense quartz patches. It varies from that species in being much smaller and with fewer leaf-bodies. The flowers are straw-coloured.

Distribution: It occurs in a relatively small area S of Kliprand in the extreme N of the Knersvlakte.

Deilanthe N.E. Br.

Species in this genus have been excised from *Aloinopsis*. Their leaf appearance is similar to plants of that genus.

Deilanthe peersii **(L. Bolus) N.E. Br**. Forms small colonies. The tongue-shaped, recurved furry leaves of the plant lie flat on the ground. They are whitish-green due to the papillae and sometimes the dust. One pair of leaves per branch are produced annually. The flowers are yellow, reddish-yellow to coppery coloured.

Distribution: From Fauresmith in the Free State, SW to Carnarvon and Laingsburg and across to Uniondale.

Delosperma N.E. Br.

This is a large genus of small to medium-sized herbs and shrubs. They usually are flat on the ground but do sometimes scramble. As this genus can, in the main, be regarded as weedy mesembs, I have included three of the more interesting plants for interest sake. The genus is characterised by the long to short glistening bladder-cell papillae. Flowering is in spring to mid-summer.

Delosperma echinatum **(Aiton) N.E. Br**. This species forms a sprawling mat which re-roots from their branch-bases with the branches densely-packed with. The leaves are green, longish-oval to ovate and covered with long glistening bladder-cell papillae. The small white flowers are sessile in yellowish-green bracts which too are covered with long glistening papillae.

Distribution: Occurs from E of Port Elizabeth, through Bathurst and S of the former Transkei.



Delosperma echinatum in habitat at Kirkwood, N of Uitenhage, E Cape
Photo Priscilla Burgoyne SANBI



Ernst van Jaarsveld



Robin Frandsen



Priscilla Burgoyne SANBI



Robin Frandsen



Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

1 & 2. ***Cylindrophyllum tugwelliae*** (1) in habitat (2) In habitat at Klaarstroom, N of De Rust
1 - 5. ***Dactylopsis digitata*** (3) in habitat in the central Knersvlakte in association with *Cephalophyllym spissum* (4 & 5) In habitat in the central Knersvlakte
6 & 7. ***Dactylopsis littlewoodii*** (6) in habitat in the N Knersvlakte. (7) In habitat in the N Knersvlakte
8 - 10. ***Deilanthe peersii*** (8) in habitat near Laingsburg (9) In habitat near Willowmore. (10) In cultivation

Niels Jacobsen



Kobus Kritzinger



Judd Kirkel Welwitch



DELOSPERMA LOOTSBERGENSE **Lavis** Forms clumps of tightly-packed sub-erect branches. The ovate leaves are blackish-green and densely covered with shortish glistening bladder-cell papillae. The flowers are large and pinkish-purple.

Distribution: This little-known species occurs around the Middelburg, Great Karoo region.

DELOSPERMA SPALMANTHOIDES **S.A. Hammer** This species forms small mats with erect, pale-green, densely and tightly-packed leaves with short white bladder-cell papillae. The flowers are large and showy, are pink and usually with a darker central line to the petals.

Distribution: Occurs in the Sutherland district.

DIDYMAOTUS N.E. BR.

This is a small very succulent, monotypic, showy plant. It is unusual in that it has two bracts which are produced at the sides of the plant which look like two separate leaf bodies, a characteristic which it shares with the very rare monotypic species, *Vlokia ater*. From these twinned bracts the scented flowers are produced laterally and open facing upwards. They open at noon and are closed by the evening.

DIDYMAOTUS LAPIDIFORMIS **(Marloth) N.E. Br**. This is a highly unusual species which inhabits very dry areas. In common with a few other very succulent species the body is covered with a waxy deposit, which contributes to the retention of moisture. It produces a single body and very rarely more. I have seen a freak occurrence in the field, where a plant had developed 12 heads. Multiple heads, when they are produced, are borne on separate branches. The flowers are large, showy and pink to whitish in the centre.

Distribution: This species is an inhabitant of the S Ceres Karoo, where it almost invariably grows with *Lithops comptonii* var. *comptonii*. It has a very limited range and grows in only a few localities, where it is locally abundant.

DINTERANTHUS Schwantes

Dinteranthus is an inhabitant of the extensive quartz field of N Bushmanland and adjacent S Namibia. It is a highly succulent plant and is much sought after in collections. It is not easy in cultivation, requiring strong light, heat and probably soil that approximates that of its habitat in order to maintain is most attractive and appealing appearance as it occurs in nature. The species are distinctive with the exception of *D. vanzijlii* which resembles a *Lithops* plant. The flowers open by mid-afternoon and close in the evening.

DINTERANTHUS INEXPECTATUS **Dinter ex H. Jacobsen** This is usually a solitary species but rarely two or more heads are produced. The sub-ovate bodies gape between the slightly-keeled leaves and are more or less smooth, but with almost inconspicuous rugosity. They are unmarked or lightly dotted. Their colour is bluish-grey. The yellow flowers are large and showy.

Distribution: Occurs in Namibia near Eendoorn, just N of the Orange River and SE of Warmbad.

DINTERANTHUS MICROSPERMUS **(Dinter & Dehrenb.) Schwantes** This species usually produces a solitary head, sometimes more. The sub-ovate bodies gape between the keeled leaves. The leaf-surfaces are chalky-white and rough to the touch. The showy flowers are yellow.

Distribution: Occurs N of the Orange River, E and N of Goodhouse river crossing in Namibia and S and SW of Pofadder in South Africa.

DINTERANTHUS POLE-EVANSII **(N.E Br.) Schwantes** Usually produces 1—2 heads. The sub-globose bodies gape, but are pressed together in the resting state. The smooth to very finely rugose leaves are very obscurely keeled and the keel at the very apex can be more pronounced. The colour is chalky-white. The showy flowers are bright yellow.

Distribution: This species occurs in a broad band from just E of Prieska to N of Kakamas.

DINTERANTHUS PUBERULUS **N.E Br.** This species produces up to 7 branches. The leaves are keeled and the colour is whitish to greenish to palest pink on the old leaves and along the margins. The surface is papillate and dotted. The flowers are golden-yellow, often reddish-tinged.

Distribution: Occurs in Namibia, near Eendoorn, in South Africa it is found SE, SW and S of Pofadder.



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

Robin Frandsen



1. ***Delosperma lootsbergense*** in habitat near Jamestown, SW of Lady Grey, E Cape
2 & 3. ***Delosperma sphalmanthoides*** in habitat near Komsberg, N of Laingsburg
4 - 6. ***Didymaotus lapidiformis*** (4 & 5) in habitat at Perdefontein, E of Karoopoort, Ceres Karoo. (6) In habitat and in association with *Tanquana prismatica* at Beukesfontein, N of Karoopoort. Note the odd 3-lobed plant in the centre
7 & 8. ***Dinteranthus inexpectatus*** in habitat at Eendoorn, Warmbad, Namibia
9. ***Dinteranthus microspermus*** in habitat at Sperlingsputs, Warmbad, Namibia
10. ***Dinteranthus puberulus*** in habitat at Eendoorn, Warmbad, Namibia
11. ***Dinteranthus pole-evansii*** in habitat



Robin Frandsen

Robin Frandsen





Gerhard Beukes



Gerhard Beukes



Gerhard Beukes



Gerhard Beukes

Gerhard Beukes



Dinteranthus vanzylii **(L. Bolus) Schwantes** This anomalous species was originally thought to have been a *Lithops*. It is however not possible to place it in that genus, *inter alia,* because of its very small and numerous seeds in the seed capsule. Like *Lithops* it grows with much of its body underground. The smooth leaves are closely pressed together and flattish at the apex. The upper surface is marked with dichotomous lines. Flowers are bright yellow.

Distribution: *Dinteranthus vanzylii* occurs S and SW of Pofadder.

Dinteranthus wilmotianus **L. Bolus** This species produces 2—7, usually up to 4 branches. It is forms subglobose bodies with gaping leaf-pairs. Leaves are grey, slightly rugose, with a definite keel. The flowers are showy and bright yellow.

Distribution: Occurs from just N of Kakamas to points E and SE of Pofadder.

Diplosoma Schwantes

This genus has two species, *D. luckhoffii* and *D. retroversum.* These are dwarf deciduous leaf succulents which are solitary or forming small clusters. Leaves are opposite, linear oblong, obtuse, smooth to papillose, ascending to horizontally spreading, softly succulent and fused at the base. Flowers, which open after midday, close in the evening, are ebracteate, solitary, terminal, shortly pedicellate to sessile, at the base and between the leaves, white, mauve or red. They are confined to limited regions, far removed one from the other.



Dinteranthus wilmotianus in habitat on the Farm Geelkop, Kakamas district. Photo Gerhard Beukes

Diplosoma luckhoffii **(L. Bolus) Schwantes** This dwarf species is a solitary deciduous plant with a small swollen caudex. The green, semi-transparent, glabrous leaves are ascending, opposite, fused at the base, oblong, obtuse, softly succulent and papillose covered with translucent prominent round to oblong translucent dots. Flowers are showy, pale-pink or pure white.

Distribution: This very rare and cryptic species is confined to the quartz-covered steep slopes of the Soutrivier in the central Knersvlakte.

Diplosoma retroversum **(Kensit.) Schwantes** This is a dwarf acaulescent, perennial species without a caudex, which forms small clusters. Leaves have a few translucent, round to oblong transluscent dots and are bright-green, becoming red with age prior to falling. They are produced annually during the autumn. Flowers are showy, white to pink opening during the noon period. The species is distinguished from *Diplosoma luckhoffii* by its sessile flowers, smooth, not papillate leaves and being without a caudex.

Distribution: It is confined to the Renosterveld flats between Piketberg and the Oliviersrivier mountains. Agriculturally it falls within an important wheat-growing area and its habitat is presently threatened.

Dorotheanthus Schwantes

This is a common annual garden species which is best-known for its brilliant and showy multi-coloured flowers, which open in the morning and close at night and which are up to 40 mm in diameter. They form low-growing mats with the leaves from oblong to lanceolate to long-linear. They are shiny with large to small glittering water cells. Some eight species are identified, of which five are represented here. The transfer of this distinctive genus to *Cleratum* is not supported here.



Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



Robin Frandsen

Robin Frandsen





Priscilla Burgoyne SANBI

1 & 2. ***Dinteranthus puberulus*** (1) in habitat near Aggeneys (2) In habitat SW of Pofadder
3 & 4. ***Dinteranthus vanzylii*** in habitat S of Pofadder
5 & 6. ***Diplosoma luckhoffii*** in habitat in the central Knersvlakte
7 - 9. ***Diplosoma retroversum*** in habitat at Eendekuil, N Swartland, NE of Piketberg. The 'duck-foot' mesemb.



Priscilla Burgoyne SANBI



Robin Frandsen



Robin Frandsen

Robin Frandsen



Dorotheanthus bellidiformis **(Burm.) Schwantes** This species is compact and little-branching. The leaves are lanceolate to spathulate with glittering bladder cells. The showy flowers are up to about 30 mm in diameter. Their colour has a wide range from pale yellow, through yellow to pink to red, usually with a lighter, to white, centre.

Distribution: Favours sandy soil and occurs from Calvinia S to Cape Town and in a broad swath to Riversdale in the Little Karoo.

Dorotheanthus booysenii **L. Bolus** This species has spathulate, somewhat lanceolate leaves with glistening bladder cells. The showy flowers are snow-white to tinged with pink, especially towards the tips of the petals. The characteristic long red filaments, against the white of the petals, are attractive in their contrast.

Distribution: Occurs S of Sutherland in the Great Karoo.



Dorotheanthus booysenii in cultivation, clearly showing the characteristic long red filaments *Photo Bob Chinnock*

Dorotheanthus clavatus **(Haw.) Struck** This species forms clumps and has long linear channelled green leaves with bladder cells. The flowers vary from reddish-magenta with centres white. Stigmas and anthers are black.

Distribution: Occurs on the Swartland sandy flats around Piketberg to Hopefield in the SW Cape.

Dorotheanthus maughanii **(N.E Br.) Ihlenf. & Struck** This species forms mats of spathulate, lanceolate, green leaves with glittering bladder cells. The flowers are pure white, yellowish or pale pink and sometimes with a yellow ring at the base of the flower. Note the unusual fleshy outgrowths in the centre of the flower.

Distribution: Occurs in the Calvinia district.

Dorotheanthus rourkei **L. Bolus** The plants are clump-forming and the leaves of this species are narrowly lanceolate with glittering bladder cells. Green to reddish. The flowers are deep red and the petals taper to a sharp point.

Distribution: Occurs in the Vanrhynsdorp area of the W Cape.

Dracophilus Schwantes

This genus recognises four species. They are perennial, tuft- and clump-forming plants with their leaves oblong to rhomboidal, with toothed to entire obtuse to acute leaves, which are blue to grey to grey-green. Flowers are open late afternoon until late at night. They inhabit the desert SW Namibia into the NW Richtersveld. One species of the four recorded is featured here.

Dracophilus dealbatus **(N.E. Br.) Walgate** This beautiful species inhabits deep sand. The branches are very short and usually 4—leaved. The leaves are grey-green and smooth with a flat upper surface and keeled margins. The flowers are cerise to pink, lighter towards the centres but a population of white-flowered plants have been seen W of the Buchuberg in the Sperrgebiet. Some plants in the Richtersveld also have white flowers. The previously well-known *D. montis-draconis* and *D. proximus* have been included in this species.

Distribution: Occurs from the NW Richtersveld northwards to S of Witputs in Namibia, but away from the coast.

Ebracteola Dinter & Schwantes

This is a small much-branched tufted plant with a thickened taproot, dividing and thickening towards the



Darrel Plowes



Darrel Plowes



Bob Chinnock



Bob Chinnock

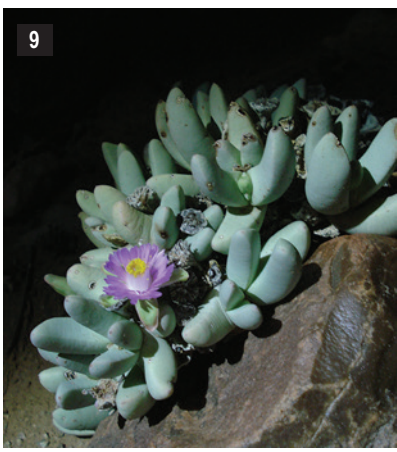
1 - 3. ***Dorotheanthus bellidiformis*** (1-2) Known as 'Livingstone's Daisy, the plants in habitat (3) A yellow-flowering form in cultivation
4. ***Dorotheanthus clavatus*** in habitat near Hopefield, SW Cape
5 & 6. ***Dorotheanthus maughanii*** (5) in habitat near Calvinia (6) flower showing the strange process in its centre
7. ***Dorotheanthus rourkei*** in habitat near Vanrynsdorp
8 - 10. ***Dracophilus dealbatus*** (8) in habitat S of Sendlingsdrift, N Richtersveld (9 & 10) previously known as *D. proximus*, but transferred by Heidi Hartmann to *D. dealbatus* in habitat; flowering at night, S Richtersveld.



Bob Chinnock



Bob Chinnock



Judd Kirkel Welwitch

Judd Kirkel Welwitch

Tim Peatling

Robin Frandsen







apex where many branches are produced. It has light green to deep green leaves which are green- or black-dotted and which are often purple-tinged mainly towards the apex. The almost sessile flowers are white to pink and darker pink towards the tips of the petals.

Ebracteola fulleri **(L. Bolus) Glen** This tufted species forms slender, pointed, more or less cylindrical pale-green to purplish-grey leaves. The large, showy prolific flowers are pink to cerise, with a lighter centre. White-flowering plants are encountered.

Distribution: Occurs from Warmbad Dist. in S Namibia, southwards into N. Cape and across to Kenhardt.

Ebracteola montis-moltkei **(Dinter) Dinter & Schwantes** This species forms flattish mats flowering mainly in the centre of the plant. The leaves are greyish-green with small spots, triquetrous, long and pointed at the apex. The flowers are single, very occasionally producing two. Rarely white, they are usually purple to pink.

Distribution: Occur in the E slopes of the Auas Mountain E of Windhoek in Namibia.

Ebracteola wilmaniae **(L. Bolus) Glen** This South African species forms a glabrous shrub. The whitish-green, finely-dotted leaves are trigonous, long and tapering to a point. The flowers are white through pink to dark pink.

Ebracteola wilmaniae in cultivation
Photo Bob Chinnock



Distribution: Occurs in the Hay District, W of Kimberly from W of Papkuil in the W and northwards to Vredefort in the Free State.

Faucaria Schwantes

This genus comprises plants which are generally tightly-formed clumps. The leaves are trigonous, with the margins generally with short to longish deltoid teeth which are sometimes bristle-tipped. Leaves may be plain or spotted and range in colour from purplish to dark green and sometimes with a whitish margin to the keels. The flowers are white to yellow to rust-red in colour. They are popular in cultivation.

Faucaria bosscheana **(A. Berger) Schwantes** This is a compact dwarf species with light grey-green leaves which are sometimes tinged with brownish-purple along the edge of the ventral face and especially on the back. These rigid leaves have waxy surface and a prominent raised whitish horny margin to the keels and edges. The keels are prominently chin-shaped. The edges usually have a few deltoid teeth. The flowers are showy, large and golden-yellow.

Distribution: Occurs from about Beaufort West to Aberdeen, S to Prince Albert and across to Steytlerville.

Faucaria britteniae **L. Bolus** This species forms compact somewhat globose clumps of loosely packed pale spotted whitish-green leaves, which are are glaucous with a wax coating and a continuous greenish to reddish horny edge. They are sometimes suffused with red. The somewhat concave upper surface is edged with prominent whitish recurved teeth which develop into a long awn. The flowers are large, showy and bright yellow.

Distribution: Occurs from Fort Beaufort, S to Grahamstown and E to beyond Committees in the E Cape.

Faucaria felina **(Weston) Schwantes** This compact species forms short, thick rhizomes. The leaves are concave on the insides with prominent horny-edged keels which have whitish to yellowish prominent recurved deltoid teeth ending in an awn. The surface is waxy, pale whitish- to yellowish-green. The surface is usually covered with prominent white spots. Flowers are white (f. *candida*) to bright yellow.



Robin Frandsen



Bob Chinnock

1. ***Ebracteola fulleri*** in habitat at Gamsberg, W of Pofadder
2. ***Ebracteola montis-moltkei*** in cultivation from E of Windhoek
3 & 4. ***Faucaria bosscheana*** (3) in cultivation in Johannesburg
(4) In habitat at Kruidfontein, N of Steytlerville. Note the almost entire margins with the few flattened deltoid teeth
5 & 6. ***Faucaria britteniae*** in habitat in the Ecca Pass, NE of Grahamstown
7 & 8. ***Faucaria felina*** (7) The "tiger's Jaw' mesemb, in habitat SE of Graaff-Reinet
(8) In habitat S of Burgersdorp, E Cape
9. ***F. felina*** 'candida' in cultivation



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Robin Frandsen



Robin Frandsen

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Bob Chinnock



Distribution: Occurs from Graaff-Reinet to around Burgersdorp, S to SE Cape through Uitenhage.

FAUCARIA TIGRINA **(Haw.) Schwantes** Probably the best-known of the 'tiger's jaws' this compact species is semi-globose with age. The chinned leaves have a horny cartilaginous margin with deltoid teeth tipped with long hair-like awns. They are grey-green, sometimes reddish-tinged, waxy leaves are usually densely covered with dots, which are sometimes confluent and on the lower side, leading in broken striations to the teeth. The showy flowers are yellow and rarely red.

Distribution: Occurs in the Albany district of the E Cape from E of Grahamstown W to beyond Uitenhage.

FAUCARIA TUBERCULOSA **(Rolfe) Schwantes** This unmistakable species is similar in all respect to *F. tigrina*, and *F. felina*. It is also with recurved teeth and long hair-like awns. The distinguishing feature being the large prominent tubercles which are on the face of the leaves. The flowers are large, showy and yellow.

Distribution: Occurs in the Bedford district around Fort Beaufort.


3

Bob Chinnock


4

FENESTRARIA **N.E. Br.**

This monotypic genus is confined to deep plain or gravelly sand, where the major part of the plant is subterranean, with only the tips of the affenestrated leaves exposed to the harsh sunshine of its desert habitation. Flowers are open after midday to late afternoon.

FENESTRARIA RHOPALOPHYLLA **(Schltr & Diels) N.E. Br.** The plant ramifies into many branches underground on fleshy adventitious roots. The plant produces large flat mats of fairly long, club-shaped leaves with only their windowed apices protruding above the sand. The distinguishing feature between the two subspecies is the size and colour of the flowers: subsp. *rhopalophylla* has smaller white flowers, up to about 50 mm in diameter; subsp. *aurantiaca* has larger, very showy, golden yellow flowers, up to about 70 mm in diameter.

Distribution: Occurs on the coastal sandy strip of desert from S of the Orange River mouth to S of Lüderitz. The subspecies *rhopalophylla* is confined to N of the Orange River mouth and subsp. *aurantiaca* to the S parts of the range, just N of the river mouth, southwards across the river and inland, not much further E than Beauvallon in the Richtersveld.

FRITHIA **N.E. Br.**

The genus *Frithia* superficially resembles *Fenestraria* but is not at all related. The habitat of the two plants are great distances apart, the one in the coastal desert of the N Cape and Namibia, and the other in the summer rainfall central hinterland, in Gauteng. This plant, unlike *Fenestraria*, is not buried and the little cylindric leaves, with their windowed apices, are above ground, but the roots are contractile and withdraw the plant somewhat underground in unfavourable conditions. There are two species recorded. Flowers are open from mid-morning to mid-afternoon.

FRITHIA HUMILIS **Burgoyne** This is the smaller of the two species, forming tufts of about 3 cm in diameter. Leaf windows, less than 3 mm in diameter, are irregular around the edges and somewhat concave in the centre. The surface of the leaf-walls have glittering water cells and the surface is asperulous. Flowers are white with yellow bases to pinkish, rarely purple.

Distribution: Occurs in quartzite, quartz sand and pebbles along the E reaches of the Magaliesberg, until where it peters out onto low ridges in the region of Bronkhorstspruit.



Robin Frandsen



Bob Chinnock

1 & 2. ***Faucaria tigrina*** in cultivation
3 & 4. ***Faucaria tuberculosa*** in cultivation
5. ***Fenestraria rhopalophylla*** **subsp.** ***aurantiaca.*** Indistinguishable from subsp. *rhopalophylla* when not in flower. Flowers showy and golden-yellow in habitat in deep sand at Beesbank, E of Beauvallon, N Richtersveld

6 & 7. ***F. rhopalophylla*** **subsp.** ***rhopalophylla*** (6) in habitat (7) In habitat near Lüderitz. Note the smaller flowers
8 & 9. ***Frithia humilis*** in habitat at Vlakfontein, E Gauteng



François Hoes



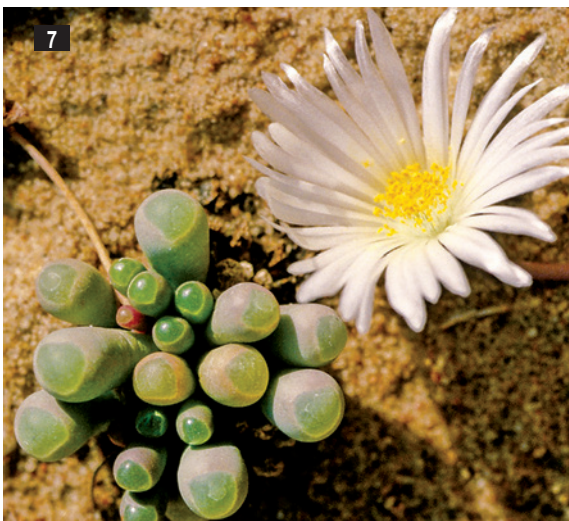
Judd Kirkel Welwitch



Judd Kirkel Welwitch

Gerhard Beukes





Darrel Plowes

FRITHIA PULCHRA **N.E. Br.** This is the larger of the two species forming clumps of up to 3 cm or more. The windowed apices are up to about 5 mm in diameter. Apical markings seem to be less definite than with *humilis.* The surface of the leaf-walls have glittering water cells and the surface is asperulous. Flowers are reddish-purple with lighter bases to white, with orange bases.

Distribution: W of Rustenburg and eastwards along the summit of the Magaliesberg to near Bronkhorstspruit.

GIBBAEUM (Haw.) N.E. Br.

The genus *Gibbaeum* comprises some 18 species, the latest which has controversely been added is *G. muirii* formerly *Muiria hortenseae*. I have not upheld this transfer and *Muiria* will be dealt with separately. The taxa within Mesembryanthemaceae have over the years been the subject of intense manipulation by taxonomists. As a result there was an enormous plethora of species. Fortunately *Gibbaeum* has escaped somewhat lightly. None of the plants in this genus are particularly easy to cultivate to their greatest advantage and natural appearance. Special conditions are desirable to maintain the most natural appearance of the plants. Flowers open after midday and close in the evening.

GIBBAEUM ALBUM **N.E. Br.** This species is clump-forming and is arguably the most attractive of the genus. The white, densely tomentose epidermis, the compact nature of its subglobose leaves and its white to pink flowers all combine to make this a highly-prized species. Like most of the gibbaeums *G. album* is usually encountered in white quartz patches. Where the plants are found outside of these patches, especially in the E of their range, where they occur in clayey soil with little or no quartz, they are not generally as spectacular and beautifully developed as those which occur on the quartz. Specialised conditions and handling are required for the successful cultivation of this species; especially if its beautiful natural appearance is to be maintained.

Distribution: Confined to a short range on the N foothills of the Langeberg mountains in the Little Karoo.

GIBBAEUM ANGULIPES **(L. Bolus) N.E. Br.** This species forms large mats, which may be virtually continuous over a large area in a dense population. Leaf colour within a single population may vary through grass-green, yellow-green or any intermediate hue. They are pubescent, their shape is long and narrow like those of *G. pachypodium* but about half the size. Flowers are magenta in colour.

Distribution: It occurs on the N foothills of the Langeberg in the E, central Little Karoo. It forms large stands which are limited to quartz patches. The habitat is mainly Renosterveld.

GIBBAEUM DISPAR **N.E. Br.** This attractive glittering-white clump-forming species is a close rival to *G. album* as the most attractive of the species. The leaves are hemisphaerical, hairy, and usually the same shade of brown as the shale. Their most distinctive feature is the indumentum, which consists of simple and branched hairs in about equal numbers. Flowers are pink to cerise.

Distribution: This species is rather rare, and is restricted to a small area of the Little Karoo S of Vanwyksdorp in the S Little Karoo. In the field the plant may be distinguished by the fact that it usually grows on pale grey-brown shale, although one locality is recorded where it grows on mixed shale and quartz.

GIBBAEUM ESTERHUYSENIAE **L. Bolus** This attractive mat-forming species appears to be intermediate between *G. velutinum* and *G. gibbosum*. It is a clump forming species with each branch having 1—3 pairs of glabrous leaves which are triquetrous with their apices distinctly hooked. One leaf of the pair larger than the other. The flowers are pink.

Distribution: This rare and much localised species occurs on N facing quartz gravel hills adjacent to the Breë river and near the confluence of the Riviersonderend and Breë rivers, on flats and ridges and on top of outcrops in Renosterveld S of the Langeberg, outside of the Little Karoo.

GIBBAEUM GEMINUM **N.E. Br.** This charming, small species, which is smaller than *G. pubescens*, forms small mats of horizontal stems. The leaves are terete, green, with the tips reddish to pinkish-brown, densely pubescent, with one of the pair larger than the other. Flowers are deep to pale magenta

Distribution: Plants occur in a wide band across the N reaches of the Warmwaterberg in dry Karoo habitat, from Bakoond to the Bellair Dam. It is a vigorous mat-forming species occurring within and outside of the quartz patches.



Judd Kirkel Welwitch



Judd Kirkel Welwitch

1 & 2. ***Frithia pulchra*** in habitat at Breedts Nek, W of Pretoria
3 & 4. ***Gibbaeum album*** in habitat at Springfontein, E of Garcia Pass, in close association with *Muiria hortensae*
5. ***Gibbaeum angulipes*** in habitat, NW of Garcia Pass, S Little Karoo
6. ***Gibbaeum esterhuyseniae*** in habitat W of Swellendam, SW Cape
7. ***Gibbaeum geminum*** in habitat N of the Warmwaterberg, W. Little Karoo
8 & 9. ***Gibbaeum dispar*** in habitat S of Vanwyksdorp, Little Karoo.



Robin Frandsen



Robin Frandsen



Robin Frandsen



Ernst van Jaarsveld

Robin Frandsen



Robin Frandsen





***Gibbaeum gibbosum* (Haw.) N.E. Br.** This species forms tight clumps. The leaves are trigonous, glabrous, rather sharply-keeled, narrowing sharply at the end of leaf sheath. The leaf-pairs are unequal in length. Their colour is emerald green, yellow-green, yellowish or coppery red, Flowers are pink to magenta

Distribution: The plant occurs in tight clusters on pebble patches, sandstone and shale and sand. Sometimes it is found in the shade of small karoo bushes. It occurs in the W Little Karoo, northwards to Touws River, across to Matjiesfontein and to Laingsburg.

***Gibbaeum haaglenii* H.E.K. Hartmann** This species, together with *G. esterhuyseniae*, does not occur at all within the Little Karoo. It is a mat-forming species. The opposite leaves are unequal in length and have rounded to sharp keels. The leaves are covered with stellate hairs and are silvery-glaucous, pale green or grey. The flowers are magenta or pink. The species has severally been named *G. haagei* and *G. austricolum*. Both names are however illegitimate.

Distribution: Known only from the foothill region of the Langeberg on the S side, outside of the Little Karoo, where it grown on flats with quartzite in Renosterveld.

***Gibbaeum heathii* (N.E. Br.) L. Bolus** This iconic species with its round shape and attractive flowers is probably the best-known of the genus. It forms clumps with 2—3 leaf pairs, older pairs imbricate around youngest, partly enclosing it. The leaves are hemispherical to hemi-ellipsoid, rarely very slightly keeled, glaucous, white or reddish, becoming pale green with moisture; the leaf-pairs are almost identical in size. Flowers are white to deep pink and plants seen near Bloutoring had flowers which were a dark cerise, in colour (Frandsen 1997).

Distribution: This is a fairly common species occurring in or out of quartz patches. Its range is from SE of Lemoenshoek, northwards across the entire central region of the major *Gibbaeum* concentrations, from near Vanwyksdorp in the E, to Bloutoring in the W and Perdefontein in the north. This species is also found NW of Laingsburg in the Great Karoo and also near Calitzdorp in the northern Little Karoo.

***Gibbaeum nebrownii* Tischer** This is a rare and cryptic, clump-forming species, with the leaf apices level with or only slightly above ground. Each stem has one pair of leaves. Leaf bodies comprise two connate leaves, with the apical fissure about three quarters of the width of the plant body. It has the distinction of being the member which is the most difficult to see in the field. Plant bodies are the same size, shape and general colouring as the shale pebbles among which they grow. Most plants seen showed evidence of injury which is ascribed to sheep having trodden or gnawed on them. In the rainy season the tops of the bodies are level with the surrounding soil; in the dry season the plants sink into the ground and are hidden by a thin layer of dust and debris. Flowers are pale pink.

Distribution: The species is confined to shale bands on open terrain, occurring in fissures in shallow soil on both hilltops and flats. It occurs north and W of the Warmwaterberg in the S Little Karoo.

***Gibbaeum pachypodium* (Kensit) L. Bolus** This species is similar to the larger *G. angulipes*. It forms spreading mats of up to 600 mm in diameter but often of irregular shape; each stem with 2 or more leaf pairs. The long symmetrical leaves are trigonous to terete, one of a pair somewhat larger than the other, they are burnt sienna to grey-green in colour and covered with soft hairs, moderately to sparsely pubescent. Flowers are pale to deep pink

Distribution: It occurs on white quartz patches on lower hill slopes or plains in the central Little Karoo.

Robin Frandsen





Robin Frandsen



Ernst van Jaarsveld



Robin Frandsen

1 & 2. ***Gibbaeum gibbosum*** (1) in habitat in association with *Crassula columnaris,* W of Touws River
(2) In habitat S of Bloutoring, W Little Karoo
3 & 4. ***Gibbaeum haaglenii*** in habitat S of the Langeberg Mountains
5 - 7. ***Gibbaeum heathii*** (5) in habitat in the W Little Karoo
(6) In habitat in association with *Rhinephyllum muirii,* N of the Warmwaterberg, W Little Karoo
(7) In habitat near the Bellair Dam, W Little Karoo
8. ***Gibbaeum nebrownii*** in habitat N of the Bellair Dam, W Little Karoo
9 & 10. ***Gibbaeum pachypodium*** (9) in habitat E of Garcias Pass, S Little Karoo
(10) in habitat in the S Little Karoo



Ernst van Jaarsveld



Priscilla Burgoyne SANBI



Robin Frandsen



Robin Frandsen



Robin Frandsen



Judd Kirkel Welwitch

***GIBBAEUM PETRENSE* (N.E. Br.) Tischer** This species forms fairly large clumps or mats. Each stem has up to 3 leaf pairs and old persistent leaf bases. Leaves tetrahedral to deltoid-reniform, very conspicuously keeled, glabrous, glaucous-grey except after rain or in cultivation, then grey-green. Its flowers are magenta.

Distribution: This species is confined to the S Little Karoo, occurring on quartz flats and hillocks, where it is locally abundant.

***GIBBAEUM PILOSULUM* (N.E. Br.) N.E. Br.** This attractive, compact, mat-forming species inhabits mainly quartz patches in association with *G. heathii* in the SW Little Karoo. The rounded bodies, with the fissures usually off-centre, are green and heavily pilose. Flowers are purple to pink. I have included the species *G. nuciforme* within this species as a subspecies. What separated the two species by previous taxonomists was the feature of the glabrous nature and the more conical shape. My observations have shown that many of the plants have hairs, though far less than subsp. *pilosulum* and that the conical shape is an insufficient reason for the separation of the two into their own species status. The previous species *G. nuciforme* is hereby incorporated as *G. pilosulum* subsp. *nuciforme* Frandsen comb. nov.

Distribution: *Gibbaeum pilosulum* is an inhabitant of the Little Karoo, N of the Warmwaterberg. The subspecies *pilosulum* is found to the E and central of the mountain range and subsp. *nuciforme* to the W and NW of the Little Karoo. It is also found in an isolated population at Gamkas Kloof in the E Little Karoo. Both taxa form dense stands in places.

***GIBBAEUM PUBESCENS* (Haw.) N.E. Br.** The most common of the genus, this species forms conspicuous silvery cushions which become almost hemispherical with age. Each stem has a pair of anisophyllous leaves at tip and remains of old leaf-bases below. The leaves are terete, silvery grey, cream or glaucous becoming pale glaucous green in cultivation They are densely pubescent. Flowers are magenta and rarely pink. This common species has been regarded as distinct from *G. shandii*, as that taxa has stellate hairs, which are not all down-pointing. The green colouring of the bodies is therefore not obscured as much as that of *G. pubescens*. Furthermore *G. shandii* has a seed capsule which is pointed at the apex. I regard these differences as being insufficient for the wide separation of the two taxa and I therefore propose that *G. shandii* be incorporated as a variety of *G. pubescens*. As the two taxa are found growing together in places, *G. shandii* must therefore be regarded as a variety and not a subspecies. The previous species *G. shandii* is hereby incorporated as *G. pubescens* var. *shandii* R. Frandsen comb. nov..

Distribution: This iconic species is easily visible at a distance, as silvery masses on the background of the white quartz patches in which they occur. It seems that the typical subspecies rarely if ever grows away from these white quartz patches. On this substrate, however, it is plentiful throughout the W Little Karoo. The variety *pubescens* is widely distributed from Lemoenshoek in the S Little Karoo, northwards and along the northside of the Warmwaterberg. The variety *shandii* is encountered on the northside of the Warm-waterberg in association with *G. pubescens*. Both favour quartz pebble fields although not exclusively.

***GIBBAEUM VELUTINUM* (L. Bolus) Schwantes** This distinctive species forms clumps to 600 mm in diameter; each branch with 1—3 pairs of leaves. The sharply-keeled pubescent leaves are triquetrous, with one much longer than other. The colour is emerald green or partly reddish. The plant has longer more robust leaves than the similar gibbaeums of its area. Flowers are white, to deep pink, to magenta.

Distribution: This species grows on white quartz patches or rarely on yellow to pale brown sand at the foot of the N slopes of the Langeberg, E of Barrydale in the Little Karoo.

GLOTTIPHYLLUM N.E. Br.

Glottiphyllum means *tongue-leaf*. The leaves do suggest the shape of a tongue. They are characterised by their outer distichous leaves usually lying on the ground, with two

Robin Frandsen





Robin Frandsen



Robin Frandsen



Robin Frandsen

1 & 2. ***Gibbaeum petrense*** (1) in habitat at Springfontein, S Little Karoo in association with *Euphorbia susannae*
(2) At the same locality in association with *Muiria hortensae*
3. ***Gibbaeum pilosulum*** **subsp.** ***pilosulum*** (3) in habitat N of the Warmwaterberg, W Little Karoo
4 - 6. ***G. pilosulum*** **subsp.** ***nuciforme*** (4) in habitat NW of the Warmwaterberg
(5) In habitat and in association with *Rhinephyllum muirii,* S of Bloutoring, W Little Karoo
(6) A specimen erupting from dormancy, S of Bloutoring
7 & 8. ***Gibbaeum pubescerns*** **var.** ***pubescens***
(7) in habitat at Lemoenshoek, S Little Karoo
(8) In habitat N of the Warmwaterberg
9 & 10. ***G. pubescerns*** **var.** ***shandii*** in habitat N of the Warmwaterberg
11. ***Gibbaeum velutinum*** in habitat W of the Garcias Pass, S Little Karoo

Robin Frandsen



Robin Frandsen



Robin Frandsen





Robin Frandsen



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch

principal growth forms observed: mat-forming and a compact form. The leaves are somewhat flaccid to firm. Some flowers are borne on a very short pedicel, appearing to be sessile. These are bright-yellow and showy. White-flowered plants are rarely encountered. These arid-land plants are generally very easy in cultivation but tend to get very large when cultivated in wetter areas due to more available moisture. Flowers open in the morning and stay open until dusk.

GLOTTIPHYLLUM DEPRESSUM **(Haw.) N.E. Br.** This is a variable, moderately-branched plant with smooth decumbent or ascending leaves of irregular shape which usually have a distinct apical hooks, with several leaf-pairs to a branch. They are sometimes with a white tip and/or a white-edged keel. They are green with a thin wax coating. Flowers are sweet-smelling and are bright yellow on a short stalk.

Distribution: Occurs from the S Ceres Karoo, across to the Little Karoo and southwards towards the coast.

GLOTTIPHYLLUM DIFFORME **(L.) N.E. Br.** This species forms large mats, sometimes in fairly large colonies. The erect leaves are triquetrous with somewhat sharp keels which are often tinged with red. The short leaves are bluntish and acuminate and the longer leaves are compressed with a keeled tip and with a tooth-like protuberance near the base. The flowers are bright lemon-yellow.

Distribution: Occurs in the Great Karoo from about Aberdeen, S to Willowmore and E to about Victoria West.

GLOTTIPHYLLUM FERGUSONIAE **L. Bolus** *G. fergusoniae* is a compact species. The chinned leaves are decussate, erect, pointed and ascending from a pustulate base, with several pairs to a branch. They have a thick wax coating which imparts a greyish colour. Flowers are bright yellow on a short stalk.

Distribution: It is restricted to rocky habitats on shale or sandstone in the W Little Karoo.

GLOTTIPHYLLUM GRANDIFLORUM **(Haw.) N.E. Br.** This is a decumbent, compact species with strap-shaped leaves with hooked and rounded apices in a dense distachous arrangement, with several pairs to a branch,. They have a thick wax coating which imparts a greyish colour. Flowers are yellow, large and showy, on a short stalk.

Distribution: Occurs in valley bushveld in the E Cape, especially in the Albany district.

GLOTTIPHYLLUM LINGUIFORME **(L.) N.E. Br.** This is a plant with three to a few more distichous, decumbent branches. The leaves are several pairs to a branch, lorate with rounded tips and acute margins, narrowing somewhat towards the base. The plant has a thickish wax-coating which imparts a somewhat grey colour to the leaves. Flowers are yellow.

Distribution: Occurs in the central and W Little Karoo northwards across the mountains to the Laingsburg Touws River region.

GLOTTIPHYLLUM LONGUM **(Haw.) N.E. Br.** This is a compact to caespitose species of 3—5, and later, many branches. The leaves are decumbent to ascending, flat, thinly waxy and strap-shaped with rounded margins which are basally ciliate. Their colour is green to purplish. The flowers are large and yellow. This leaves of this species is very similar to those of *G. grandiflorum*.

Distribution: Occurs across the Little Karoo and N of the Swartberg across to near Port Elizabeth.

GLOTTIPHYLLUM NELII **Schwantes** This is a compact species forming up to about five branches, with several to many leaves to a branch. The anisophyllous leaf-pairs are distichous with reddish margins. The longer leaf is flat on one side and keeled with the tip rounded and somewhat incurved. The shorter is bent upwards. The sessile flowers are bright lemon yellow.

Distribution: Occurs from Jansenville to Prince Albert to Willowmore.

GLOTTIPHYLLUM OLIGOCARPUM **L. Bolus 9 (*see P. 378 for the illustration*)** This is a tightly compact small species with 3—5 branches. The leaves are distichous with several pairs to a branch, rounded apically and with a heavy wax-platelet covering giving the leaves a grey-glaucous appearance. The flowers are yellow. (*Illustration on P.378*)

Distribution: From Jansenville in the N, southwards to S of Willowmore and Steytlerville in the E Cape.


1

Robin Frandsen


2

Bob Chinnock


3

Priscilla Burgoyne SANBI


4

Judd Kirkel Welwitch


5

Darrel Plowes


6

Priscilla Burgoyne SANBI


7

Judd Kirkel Welwitch


8

Priscilla Burgoyne SANBI

1 & 2. ***Glottiphyllum depressum*** (1) in habitat near Touws River
(2) In cultivation. This form was previously known as *G. fragrans* as the flowers are sweet-smelling
3. ***Glottiphyllum difforme*** in habitat near Willowmore
4. ***Glottiphyllum fergusoniae*** in habitat
5 & 6. ***Glottiphyllum grandiflorum*** (5) in habitat
(6) In habitat at Uitemhage, E Cape
7 & 8. ***Glottiphyllum linguiforme*** (7) in habitat near Touws River
(8) In habitat W of Warmwaterberg, W Little Karoo
9 & 10. ***Glottiphyllum longum*** (9) in habitat near Port Elizabeth
(10) In habitat at Papiesfontein, Jeffrey's Bay
11. ***Glottiphyllum nelii*** in habitat near Willowmore, E Cape


9

Niels Jacobsen


10

Niels Jacobsen


11

Priscilla Burgoyne SANBI



Glottiphyllum oligocarpum in habitat on the Springbokvlakte, S of Kleinpoort, E Cape
Photo Robin Frandsen

GLOTTIPHYLLUM PEERSII **L. Bolus** This is a compact, mat-forming species with ascending, later decumbent stems. The paired leaves are anisophyllous with the one leaf considerably longer than the other. The leaves are very thinly wax-coated, green to purple with the margins white from corky tissue. The flowers are yellow.

Distribution: Occurs from Prince Albert across to W of Steytlerville and southwards to the Springbokvlakte in the E Cape.

GLOTTIPHYLLUM REGIUM **N.E. Br.** This species forms compact mats with ascending and later decumbent mats of several leaves to a branch. The bright green leaves of this species are the largest of the genus. They are up to 130 mm long, trigonous to terete. The flowers are yellow.

Distribution: Occurs in the Calitzdorp, Oudtshoorn district of the Little Karoo.

GLOTTIPHYLLUM SUAVE **N.E. Br.** This distinctive species is compact with three, rarely more, decumbent branches. The mostly two-pair leaves are round-tipped, incurved, almost spoon-shaped, flat on the upper surface and obtusely keeled on the underside, with sharp margins which are often red-edged. The leaves have a dense wax coating. The glossy light-yellow flowers are sessile.

Distribution: This species occurs in the Little Karoo in the Ladismith district and N, across the mountains to near Laingsburg.

GLOTTIPHYLLUM SURRECTUM **(Haw.) L. Bolus** This small species forms mats of erect to spreading branches with decussate, semi-cylindrical leaves. The wax coating is thin. The yellow flowers are sessile.

Distribution: Occurs in the N Little Karoo from Ladismith to Oudtshoorn and N to Laingsburg, Prince Albert districts.

HARTMANTHUS S.A. Hammer

This genus has two species. They are small compact shrubs and are densely-leaved and crowded on the branches. Leaves are triquetrous, smooth and clasp the branch. Flowers are sessile and are produced at the tips of the branches.

HARTMANTHUS PERGAMENTACEUS **(L. Bolus) SA Hammer** This small compact shrub is up to about 30 cm high. The branches are produced from a crowded centre. The crowded leaves are triquetrous, somewhat sharply margins, with flat upper surfaces and keeled lower. The leaves are smooth, wax-covered, pale green with the stems palest red. Old leaves are very persistent. The sessile flowers are terminally produced they are white and sometimes with pink tips.

Distribution: This arid-land species is confined to the N Richtersveld in South Africa to near Lüderitz in Namibia.

IHLENFELDTIA H.E.K. Hartmann

This is a compact small tufted genus with keeled, three-sided leaves. The leaf-margins often have tiny reddish teeth along the margins. The showy flowers are solitary up to 70 mm in diameter, they are usually yellow and are sometimes tinged with purple or red. This genus is closely related to *Cheiridopsis* from which it was excised. The winter flowers are open from midday to late afternoon.

IHLENFELDTIA EXCAVATA **(L. Bolus) H.E.K. Hartmann** (Illustrations on p. 365) This is a low, very many-branched, up to about 100 branches, compact tufted species, rarely


Priscilla Burgoyne SANBI

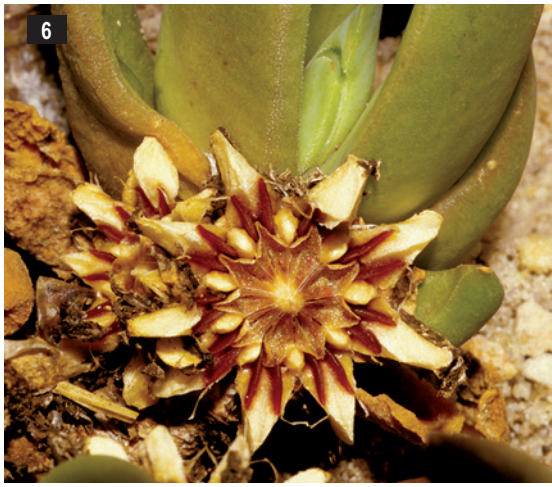

Robin Frandsen


Robin Frandsen




Priscilla Burgoyne SANBI

1 & 2. ***Glottiphyllum peersii*** in habitat
3 & 4. ***Glottiphyllum regium*** (3) in habitat in the Little Karoo
(4) In habitat near Calitzdorp, Little Karoo
5 & 6. ***Glottiphyllum suave*** (5) in habitat near Calitzdorp, Little Karoo
(6) In cultivation
7. ***Glottiphyllum surrectum*** in habitat N of Warmwaterberg SW Little Karoo
8. ***Hartmanthus pergamentaceus*** in habitat in the N Richtersveld


Bob Chinnock


Priscilla Burgoyne SANBI

Judd Kirkel Welwitch



grown sunken in the ground. The three sharply-keeled leaves are green to purplish, often suffused with red mainly towards the keels. They are excavate, mucronate and prickly from stoutish minute teeth along the teeth-margins with fine translucent dots. The showy flowers are variable in colour from brilliant yellow, through yellow suffused with purple and rarely white. Differs from the next species in its sharper keel, which are sometimes reddish-tinged especially on the keel.

Distribution: Occurs from Pofadder in the E across to N of Steinkopf in the W.

IHLENFELDTIA VANZYLII **(L. Bolus) H.E.K. Hartmann** This species has fewer branches (up to 10). It is a compact, species with three-keeled leaves which are green to purplish with fine translucent dots and convex sides. The leaves are not mucronate or toothed. The showy flowers are brilliant chrome-yellow.

Distribution: Occurs from Kenhardt in the N Cape S and W to Kliprand.



Ihlenfeldtia vanzylii in habitat N of Kliprand *Photo Robin Frandsen*

JORDAANIELLA Herre

This genus can be classed with the 'weedy' mesembs. They are creeping succulents and root easily from long trailing branches with spindle-shaped leaves. Nevertheless they are spectacular in their flowering, giving a brilliant show of shiny yellow, orange, purple and even white flowers. Flowering time is winter and these open at about midday and close late-afternoon.

JORDAANIELLA SPONGIOSA **(L. Bolus) H.E.K. Hartmann** This species has been chosen for inclusion because of its remarkable and brilliant flowers. Originally and better-known as *Cephalophyllum spongiosum*, this species forms extensive mats of whitish, pale-green spindle-shaped obtusely-margined leaves which may be indistinctly margined in red. The flowers are produced on long pedicels at the apex of the branches. The brilliantly-coloured, profuse large flowers are red to cerise with bright orange to yellow centres.

Distribution: Of coastal distribution from S of Hondeklip Bay N to near Alexander Bay.

JUTTADINTERIA Schwantes

This genus is characterised by its solitary, terminal flowers, which are pink or white, low-growing woody stems, whitish leaves which are covered with flattish or rounded wax cells and has thick woody roots. It is an inhabitant of the desert regions of NW Richtersveld and SW Namibia. Two species of the five recorded is represented here.

JUTTADINTERIA ALBATA **L. Bolus** This very attractive plant forms small mats and branches laterally, sometimes rebranching, with the smooth, grey-green leaves erect. Flowers are white.

Distribution: Occurs in the N Richtersveld National Park and N to Aus and across to Lüderitz in Namibia, usually solitary and not in colonies.

JUTTADINTERIA SIMPSONII **(Dinter) Schwantes** This distinctive species forms cushions with ascending branches up to about 25 cm tall. The branches are densely leaved with the internodes barely visible. The leaves are broadly boat-shaped with margins and surfaces armed with sharp reddish prickles on tubercles. The colour is whitish-green. The flowers are terminal and almost sessile. They are shiny-white.

Distribution: Occurs from Lüderitz towards Haalenberg in S Namibia.



Robin Frandsen



Robin Frandsen



Tim Peatling



Tim Peatling

1 & 2. ***Ihlenfeldtia excavata*** in habitat S of Pofadder, Bushmanland
3 & 4. ***Jordaaniella spongiosa*** in habitat in deep sand, N of Port Nolloth
5 & 6. ***Juttadinteria albata*** in habitat in N Richtersveld National Park
7 & 8. ***Juttadinteria simpsonii*** in habitat in the Haalenberg Mountains, E of Lüderitz, S Namibia



Robin Frandsen



Robin Frandsen



Bob Chinnock

Bob Chinnock



Khadia N.E. Br.

These are compact to laxly mat-forming plants with branches which arise out of a thickened rootstock. Their somewhat semi-circular, keeled leaves are fused at the base with three-edged leaf-tips. The leaves are spotted with the spots concentrated along the margins and keels. Their colour is dark-green to grey-green. Flowers are white, pink or purple, occurring in summer. They open in the late morning and close in the evening. *K. carolinensis* opens in the afternoon.

***Khadia acutipetala* (N.E. Br.) N.E. Br.** This is a compact or lax mat-forming species with long dark-green glaucous leaves which are triquetrous towards the apices. The large fluffy flowers are deep purple to pink and rarely white.

Distribution: The species occurs in the Rustenburg district on the quartzite of the Magaliesberg mountains.

***Khadia alticola* Chesselet & H.E.K. Hartmann** This species forms largish mats with thick horizontal rhizomes. The dark to bright green, stubby leaves are triquetrous with translucent dots, up to about 15 mm in length. The flowers are pale pink and lighter towards the centre.

Distribution: Occurs on the Steenkampsberg, near Belfast, Mpumalanga and near Utrecht in N KwaZulu-Natal.

***Khadia beswickii* (L. Bolus) N.E. Br.** This rare species forms dense rhizomes with large mats of densely packed, stubby, triquetrous, glaucous leaves, which are rounded towards the base. The flowers are rather pale pink whiter towards the centre.



Khadia beswickii in habitat near Nigel, SE Gauteng
Photo Org Fritz

Distribution: Occurs SW of Johannesburg near Nigel in Gauteng.

***Khadia carolinensis* (L. Bolus) L. Bolus** This species forms dense large mats with many branches with horizontal rhizomes, not easily rerooting. The opposite compact leaves are united to each other for about 2 mm. They are trigonous with the upper side flat and with rounded margins. They are dark-green and liberally dotted with light green. Flowers are white, sometimes with pale pinkish tips.

Distribution: In the Belfast, Carolina districts. It occurs in fine sand patches in grasslands and in pockets in quartz outcrops.

Lapidaria (Dinter & Schwantes) N.E. Br.

This is a monotypic genus which was originally erected to include a species described by Dinter as *Mesembryanthemum lapidiforme*. He had confused the species with the other monotypic species *Didymaotus lapidiformis*. After some name changes the genus *Lapidaria* was erected to accommodate its species *L. margaretae.* The similarities between plants of the genus *Dinteranthus* with *Lapidaria* have been documented. The flower buds of *Dinteranthus wilmotianus* are strikingly similar and there are similarities in the seed capsules of the two genera. *L. margaretae* is, however, morphologically closer to *Schwantesia* and it could be surmised that *Lapidaria* is an intermediate between *Dinteranthus* and *Schwantesia*. Flowers are open for most of the day.

***Lapidaria margaretae* (Schwantes) N.E. Br.** This species is common and easy in cultivation. It is one of the real 'stone' plants which resembles a cluster of pebbles in the field where it commonly occurs in amongst the quartz pebbles. The plant forms compact, highly succulent clumps of 2 to 4 leaf-bodies to the branch. The leaves are sharply keeled and are pinkish, to brown to grey in colour. The flowers are golden yellow, single or up to 3 produced successively.

Distribution: This common and easily cultivated species occurs near Pofadder, to the N, as well as S and SE of Warmbad and N of Goodhouse across the Orange River in Namibia. In South Africa it occurs around Goodhouse, near Pella and around Pofadder.



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Ernst van Jaarsveld



Bob Chinnock

1 & 2. ***Khadia acutipetala*** (1) in habitat. (2) In cultivation
3. ***Khadia alticola*** in habitat on the Steenkampsberg, Mpumalanga
4. ***Khadia carolinensis*** in habitat near Belfast
5 - 7. ***Lapidaria margaretae*** (5) in habitat
(6) In habitat at Witsand, S Namibia
(7) In habitat



Gerhard Beukes

Niels Jacobsen



Darrel Plowes



Lithops N.E. Br.*

The genus *Lithops*, literally 'Stone eyes' is endemic to South Africa and Namibia with small outlier populations in SE Botswana. It has a wide distribution with its NE limit near Polokwane (Pietersburg). Its northern-most limit is the southern coastal region of the Kaokoveld in Namibia. Southwards it is found near Steytlerville in the eastern Cape and the SW limit is the Ceres Karoo. Lithops are patchily distributed throughout this large delineated region.

Their main distinguishing factor from other similar genera is the relative sameness of the *Lithops'* shapes. Generally the plant bodies are an inverted cone-shape, with a central fissure dividing the two leaves. These are sometimes deeply divided, closely adpressed or widely divergent or sometimes with only a short slit on a flattish to rounded top. In appearance they are unmistakably *Lithops*. There are however a few species from other taxa which bear a superficial likeness, such as *Dinteranthus vanzijlii* and some of the members of *Conophytum* which were formerly classified as *Ophthalmophyllum*. The major separating factor between the various species is the apical morphology which will be seen from the accompanying photographs. However within many of the same species there is a marked variation in the patterning and even in the colour of the plants. I have illustrated this by, where possible, including more than one photograph illustrating this. It is quite common within a species and can be quite bewildering at times. The bodies usually divide, creating a few to many together in clumps. Flowers are always diurnal. Enthusiasts of the genus have created and recognised a number of cultivars. Unusual abberant plants are sometimes found in nature and have been given popular names. They are often highly sought after by collectors. These abberants and cultivars are not generally included in this work. *Lithops* are usually inhabitants of drier regions to very arid desert regions. The four pictures of *L. naureeniae* on this page give an example of the variation which may exist between clones from the same locality.



Lithops naureeniae These photographs are examples of variations which may be encountered in a single species. The four pictures show the apical variation of four clones from the same colony

Lithops aucampiae **L. Bolus** This variable species is comprised of two subspecies, with varieties: subsp. *aucampiae* var. *aucampiae*, and var. *koelemanii*; subsp. *euniceae* var. *euniceae* and *euniceae* var. *fluminalis*. Plant bodies are generally light beige to yellowish brown and the species has a large variation in its apical morphology but is easily identifiable. Flowers are large and yellow. Usually cluster up to five heads, some plants of this taxa can produce up to as many as twenty heads.

Distribution: The subspecies *aucampiae* is found in a large area from Vryburg in the N, in a broad oval from W of Postmasburg, to E of Danielskuil and southwards W of Douglas. The subspecies *euniceae* is found near Hopetown.

Lithops bromfieldii **L. Bolus** This species comprises four varieties – *bromfieldii, insularis, glaudinae* and *menellii*. Plant bodies are variously coloured, yellowish or pinkish red, cream, to light orange brown. Identification between the varieties is not easy as there is much variation in the colour of the bodies and in their markings. Flowers are yellow, some abberants have white flowers. Generally clusters of up to four heads are produced, but these can number up to ten, rarely more.

Distribution: All varieties are distributed in a relatively small area around Upington, except subsp. *glaudinae* which is found S of Postmasburg.

Lithops coleorum **S.A. Hammer & R. Uijs** This unusual species was only discovered in 1992 NW of Polokwane (Pietersburg). The region southwards for hundreds of kilometres is the extensive range of *L. lesliei*, yet a single occurrence of a new species, quite different to and not closely

* **All *Lithops* photographs, unless otherwise indicated, are by Prof. Desmond Cole**



















1 & 2. ***Lithops aucampiae*** **subsp.** ***aucampiae*** **var.** ***aucampiae***
3. ***L. aucampiae*** **subsp.** ***aucampiae*** **var.** ***koelemanii***
4. ***L. aucampiae*** **subsp.** ***euniceae*** **var.** ***euniceae***
5. ***L. aucampiae*** **subsp.** ***euniceae*** **var.** ***fluminalis***
6. ***L. aucampiae*** **subsp.** ***euniceae*** **var.** ***fluminalis*** in habitat
7. ***Lithops bromfieldii*** **var.** ***bromfieldii***
8. ***L. bromfieldii*** **var.** ***glaudinae***
9. ***L. bromfieldii*** **var.** ***insularis***
10. ***L. bromfieldii*** **var.** ***mennellii***
11 & 12. ***Lithops coleorum*** (11) in habitat (12) In cultivation







related to *L. lesliei*, is most unusual. The body colour is pale grey or pinkish grey and the apical patterning consists of dots and channels of a darker colour. The flowers are yellow. Clusters rarely up to eight heads, mostly two. Plants occur amongst alluvial quartz pebbles on a conglomerate hill.

Distribution: *Lithops coleorum* is confined to one known locality near Ellisras in the Limpopo Province.

LITHOPS COMPTONII **L. Bolus** This species comprises two varieties, var. *comptonii* and var. *weberi*. Plant bodies vary from light pinkish grey to blue grey. The variety *comptonii* is distinguished by a mostly open greyish window and var. *weberi* by more occluded windows with islands. Flowers are yellow with white centres. As they tend to intergrade they could perhaps be regarded as a variable single species. *L. comptonii* inhabits the very arid Ceres Karoo. The plants are usually cryptically camouflaged between calcrete and chert shards. I have seen var. *weberi* wedged in the cracks and crevices of calcrete outcrops. In the south they are often found in close association with *Tanquana prismaticus* and *Didymaotus lapidiformis.* Can form clusters in excess of ten heads, usually much fewer.

Distribution: *Lithops comptonii* is found in southern to central Ceres Karoo, with var. *comptonii* in the S and var. *weberi* to the N of the range.

LITHOPS DINTERI **Schwantes** This attractive, small species has three subspecies, *dinteri, frederici* and *multipunctata*. The subspecies *dinteri* has an additional variety - var. *brevis*. The subspecies *dinteri* is characterised by red rubrications and dull greyish green dots and usually has an open dark to light grey window. The variety *brevis* has its windows invariably open. The subspecies *frederici* is the smallest of the species. The major difference is its much smaller size, more opaque windows and more numerous rubrications. The subspecies *multipunctata* is generally slightly larger and bolder, with the rubrications more linear. The flowers of this species are yellow. Occurs generally in quartz, granitic pebbles and stones. Plants of this species has clusters of up to about ten heads.

Distribution: var. *dinteri* is recorded N of the Orange River in Namibia, S and SW of Warmbad, var. *brevis* occurs just S of Vioolsdrif in South Africa, subsp. *frederici* W of Pofadder in South Africa and subsp. *multipunctata* in Namibia NW of Pofadder just N of the Orange River.

LITHOPS DIVERGENS L. Bolus This rare and unusual small species is well named for its widely divergent leaf lobes. There are two taxa: var. *divergens* and var. *amethystina*. The plants are a pale glossy grey green. The apices of the lobes are opaque due to extensive mottling of the occluded small islands. The variety *amethystina* is larger, differing from var. *divergens* in its more open windows. The colour is pinkish to amethyst. The flowers are small and yellow with white centres. The variety *divergens* is found in extensive alluvial quartz pebble fields and var. *amethystina* in both shale and in quartz. It generally produces up to four heads, sometimes up to ten heads.

Distribution: The variety *divergens* is confined to a narrow area from the N Knersvlakte to Garies, but is concentrated mainly in the Knersvlakte. The variety *amethystina* occurs in a narrow band from Kliprand eastwards.

LITHOPS DOROTHEAE **G.C. Nel** This is arguably the most attractive of the genus. It is popular, not particularly difficult in cultivation and is well-represented in collections. Thought has been given to include it as a subspecies of *L. dinteri* subsp. *brevis*, but the consistent features of the plant have fortunately prevented this. The locality of *L. dorotheae* was lost for a long time probably due to the incorrect locality recorded in the original 1925 description. It has since been rediscovered in two places. The colours of the margins and islands range from cream, through light yellow to pinkish. The windows are rarely completely open and usually have channels. Their colour varies in shade from brownish, greenish or greenish-grey. Many red to orange-red rubrications fill the windows together with some obscure dull and dark dots. Flowers are yellow and are medium to large. *L. dorotheae* is found in extensive fields of feldspathic and quartz pebbles and also wedged between coarse-grained rocks. Clusters of up to seven, but usually up to four heads are produced.

Distribution: *Lithops dorotheae*'s locality was formerly incorrectly described as near Pella in the N Cape it is in fact confined to a small area W of Pofadder. Although fairly common in collections it is very rare in nature.







Robin Frandsen











1 & 2. *Lithops comptonii* var. *comptonii*
(1) in habitat at Perdefontein, S Ceres Karoo
(2) in cultivation
3. *L. comptonii* var. *weberi*
4. *Lithops dinteri* var. *dinteri*
5 & 6. *L. dinteri* subsp. *brevis* var. *brevis*
7. *L. dinteri* subsp. *frederici*
8. *L. dinteri* subsp. *multipunctata*

9 & 10. *Lithops divergens* var. *divergens*
(9) in habitat in the central Knersvlakte
(10) in cultivation
11. *L. divergens* var. amethystina
12, 13 & 14. *Lithops dorotheae*





Priscilla Burgoyne SANBI









***LITHOPS FRANCISCI* (Dint. & Schwant) N.E. Br.** This species is distinguished by its numerous dusky grey dots. The islands are ragged and indistinct, although they are sometimes darker and more apparent. The indistinct windows are sometimes absent, making the apex virtually opaque. Plant body colour ranges from greyish white, through cream to pinkish. Produces clusters of up to twenty heads, but usually up to six. Flowers are small and yellow. Occurs in much-weathered, extensive gneiss and schist pebbles and stones.

Distribution: *Lithops francisci* is endemic to Namibia. It is found in a small area W of Lüderitz, in the Haalenberg and Kovisberg Mountains. It is also found further S near Tschaukaib and further N in extensive white quartz-pebble fields at Koichab.



Lithops francisci

***LITHOPS FULVICEPS* (N.E. Br.) N.E. Br.** The name *fulviceps* (tawny-brown) refers to the colour of the plants. This is inappropriate as their colour varies from grey to pinkish, to a mustard colour. What is consistent is the presence of innumerable dusky grey-green to bluish-green dots. These are linearly-placed in obscure yellow to dark red rubrications. The windows are generally opaque. Two varieties are recognised, var. *fulviceps* and var. *lactinea*. Except for its colour var. *lactinea* is similar to var. *fulviceps*. Its colour is pale pinkish-white to very pale blue-white. Flowers are large and yellow. Produces clusters of up to twelve, usually up to three heads.

Distribution: The variety *fulviceps* is mainly an inhabitant of southern Namibia, where it is found from N of Karasburg to S of Aroab. It also occurs W of Keimoes, near Lutzputs and Pofadder in South Africa. Only one colony of the variety *lactinea* is known, it is located on the extreme N of var. *fulviceps*' range, in Namibia.

***LITHOPS GESINAE* H.W. de Boer** Two varieties are recognised, var. *gesinae* and var. *annae*. The plant colour of var. *gesinae* is pinkish-grey to greenish-brown, sometimes with a pinkish glow. The windows are a smudgy green and rubrications are absent. Some dusky dots are present. In var. *annae* the colour is a reddish-brown colour, the plants and flowers are larger. Flowers are large and yellow. The variety *gesinae* produces up to ten, but usually four heads and var. *annae* produces usually one and seldom two heads.

Distribution: Variety *gesinae* occurs in a very small area NE of Aus in Namibia and variety *annae* in two very small areas E of Aus.

***LITHOPS GEYERI* G.C. Nel** This species may well be confused with *L. herrei* only that it is narrowly oval, whereas that species tends to be rounder and fatter. The plant colour ranges from pale whitish-grey through cream, creamy-yellow to pinkish. The windows can be almost entirely translucent to having large islands separated by irregular channels. Window colours range from pale grey, through greenish- or bluish-grey to grey-green. Dusky dots are present which are dull grey-green. Flowers are large and yellow, sometimes with white centres. The restricted habitat has a variety of rock types: quartz pebbles, quartzite and schist and calcrete with some quartzite. Produces clusters of up to twelve, usually up to three heads.

Distribution: *Lithops geyeri* is confined to a small region to the N, NE and E of Eksteenfontein in the Richtersveld.

***LITHOPS GRACILDELINEATA* Dint.** This species could be confused with *L. ruschiorum*. Their ranges overlap briefly and their appearance, with the fine reticulated lines on a whitish background, is similar. *L. gracildelineata*'s body-colour ranges from a uniform whitish-grey, white tinged with blue to pinkish-grey, the channels are deep red to brown. There are two subspecies: subsp. *gracildelineata*, which has two















Darrel Plowes

1 & 2. ***Lithops fulviceps*** **var. *fulviceps***
3. ***L. fulviceps*** **var. *lactinea***
4. ***Lithops gesinae*** **var. *gesinae***
5 & 6. ***L. gesinae*** **var. *annae***
7 & 8. ***Lithops geyeri*** (7) in habitat near Eksteenfontein
(8) In cultivation



9 & 10. ***Lithops gracildelineata*** **subsp. *gracildelineata*** **var. *gracildelineata***
11 & 12. ***L. gracildelineata*** **subsp. *brandbergensis***
(11) in habitat on the Brandberg, Namibia.
(12) In cultivation









varieties: var. *gracildelineata* and var. *waldroniae*; and subsp. *brandbergensis*. Little difference separates the two varieties of subsp. *gracildelineata*. The subspecies *waldroniae* has deeper and more extensive valleys, giving the effect of being more rugose. The subspecies *brandbergensis* was originally considered a variety of *L. pseudotruncatella*. The plant body colour ranges from various shades of beige to pinkish-brown and the rubrications are blood-red to brown. Flower colour of the species is yellow. Generally found in quartzite gravel. subsp. *brandbergensis* is found in reddish, weathered granite. This species is a rarity in collections and is not particularly easy in cultivation. The species rarely produces more than one body although up to five has been recorded.

Distribution: *Lithops gracildelineata* is endemic to Namibia, where it is found inland of Walvis Bay and northwards to Fransfontein. The variety *waldroniae* is found in the extreme S of the species range and subsp. *brandbergensis* occurs only on the almost inaccessible Brandberg massif.





***Lithops gracildelineata* subsp. *gracildelineata* var. *waldroniae*.**

***LITHOPS HALLII* H.W. de Boer** Two varieties are recognised in this species: var. *hallii* and var. *ochraceae*. The very distinct margins and fairly regular channels and small islands of the windows make for simple identification of this species. The colour of the plant bodies range widely from greyish to reddish-brown, some are pinkish, bluish or greenish, or pale orange. The windows and channels greyish or grey tinged with green, brown pink or yellow. Rubrications are red to reddish-brown. The variety *ochracea* varies from var. *halli* in the opaque red-brown colour and the tendency to have clear open windows. Flowers are white. Forms up to seven or more heads, usually up to three. Plants grow in many different habitat types: shale, chert, calcrete, sandstone, quartzite etc.

Distribution: *Lithops hallii* occurs in an approximate triangle from near Hopetown in the E to near Britstown in the S and to near Prieska in the W. The variety *ochracea* occurs E of Kenhardt in a broad swathe across to east of Marydale.

***LITHOPS HELMUTII* L. Bolus** This species is recognised by the wide gape between the lobes, the humped appearance of the apices and glassy, pale greenish colour. Colours are generally greenish, but are sometimes creamy-yellow and very rarely with a pinkish tinge. The windows are translucent pale grey, greenish-grey and sometimes with a hint of brown. Flowers are yellow with a white centre. Produces clusters in excess of twenty five but usually up to six.

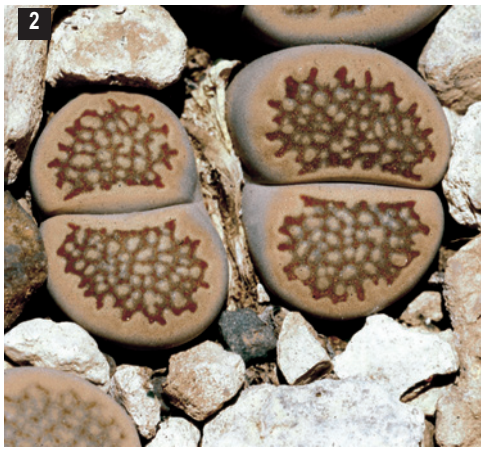
Distribution: Occurs in extensive quartz pebble fields in a very limited area NE and N of Steinkopf, N Cape.

***LITHOPS HERMETICA* D.T. Cole** This species, discovered in 1995 in a very remote area of Namibia, is not unlike *L. geyeri* in appearance. The plant bodies are light creamy greyish-green and the windows are dark translucent greyish-green. Present are obscure dusky greenish dots. Produces up to five but usually up to two heads. Flowers are yellow. The habitat comprises dark blue-grey dolomite with pale calcrete stones, chips and rubble.

Distribution: *Lithops hermetica* occurs in a single known colony along the S edge of the SW part of the Tsaus Plateau of the diamond area, the Sperrgebiet (forbidden zone), in SW Namibia.

***LITHOPS HERREI* L. Bolus** This variable species inhabits the very arid region of the N Cape and narrowly into Namibia. Two forms are recognised: the immaculate form which occurs nearer the coast and the maculate, and more opaque form which occurs further inland towards the mountains. Intermediate apical patterning is found on plants between these extreme ranges. The plant bodies range from white, through greenish, bluish, pale yellow through to pink. Windows are sometimes completely open to almost opaque with narrow to wide irregular channels, colours range from green, through yellow to bluish-green or brown. Flowers are white. *L. herrei* forms up to twenty heads but usually up to seven. Occurs in very many habitat types.





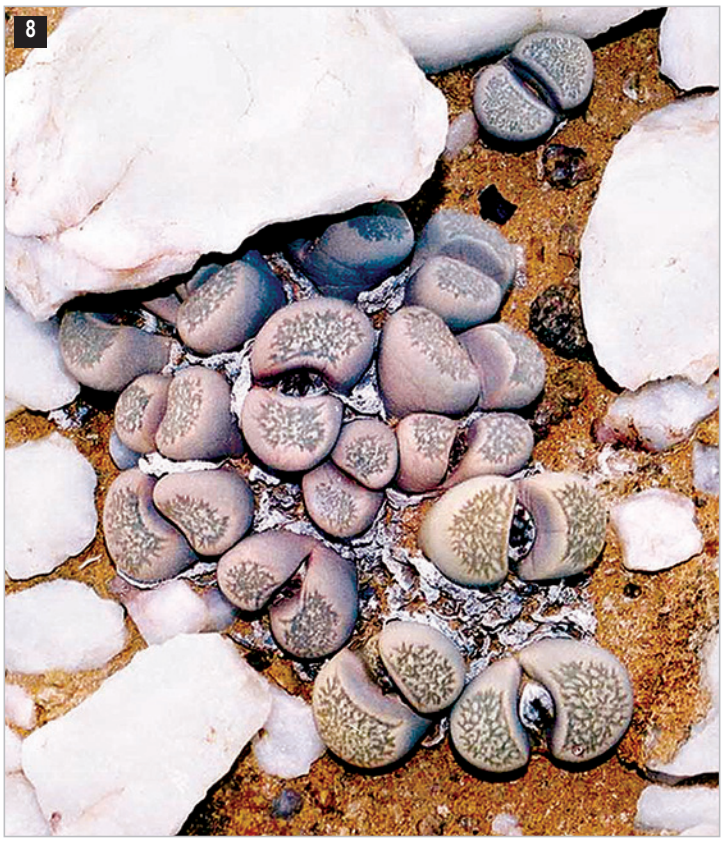








Robin Frandsen



1 - 3. ***Lithops hallii* var. *hallii***
4 & 5. ***L. hallii* var. *ochracea***
6. ***Lithops helmutii***
7. ***Lithops hermetica***
8 - 9. ***Lithops herrei*** (8) in habitat south of Sendlingsdrif, Richtersveld National Park
(9) in cultivation





Distribution: *Lithops herrei* occurs in a narrow band along the Orange River from the coast to near Sendlingsdrift on either side of the river.

***LITHOPS HOOKERI* (Berg.) Schwantes** This species was formerly known as *L. turbiniformis* which was collected by William John Burchell in September 1811 and was the first *Lithops* recorded. Apparently *L. hookeri* was previously incorrectly named *L. turbiniformis* the name which has now unfortunately ceased to exist. Seven varieties are established and it is beyond the scope of this work to attempt to describe the variations which are mainly in the colour of the bodies and windows. This is an attractive very variable species which forms clusters of as many as ten , but usually two to four. Flowers are yellow. Habitat type is across a wide spectrum.

Distribution: All the taxa of *Lithops hookeri* are apparently confined within a wide up-ended triangular region from Kimberley in the E, across to west of Marydale in the W and S to Britstown.

***LITHOPS JULII* (Dint. & Schwantes)** N.E. Br. This attractive and very variable, although easily identifiable, species is comprised of two subspecies: subsp. *julii* and subsp. *fulleri* var. *fulleri* var. *brunnea* and var. *rouxii*. Plant body colours are pale whitish-grey, to buff to whitish-pink. the bold, usually very contrasting dark reddish-brown, channels which are some-times almost as uni-coloured as the body, but nevertheless still very evident. These features are characteristic. Flowers are white. Found in a wide range of habitat but usually between white quartz rocks and pebbles. Can produce up to fifteen heads, usually less.

Distribution: The subspecies *fulleri* is confined to Namibia N of the Orange River in a triangular area with Karasburg as its apex in the N. The subspecies *fulleri* has a much wider distribution, but only in South Africa (except the variety *rouxii* which occurs only in a small area east of Vioolsdrif in Namibia). The distribution ranges from W of Aggeneys to NE of Upington, to Kenhardt and to E of Gamoep.

***LITHOPS KARASMONTANA* (Dint. & Schwantes) N.E. Br.** This is a very variable species which recognises three subspecies: subspecies *karasmontana* var. *aiaisensis*, var. *lericheana*, var. *tischeri,* subsp. *bella* and subsp. *eberlanzii*. Plant body colours range widely from brick red through pinky-red, yellowish to milky white. channels greyish-brown to pink. Generally the most attractive of the species is the subspecies *bella* due to its very distinct translucent windows and colour. Its flowers are also generally very large relative to the body-size. It is easily identifiable and popular in cultivation. *L. karasmontana* produces up to







Lithops julii* subsp. *julii Above & right: showing the various pattern and colour forms

Lithops julii* subsp. *fulleri showing pattern variation





Lithops julii* subsp. *fulleri* var. *brunnea Below: showing pattern variation



















1. ***Lithops hookeri* var. *hookeri***
2. ***L. hookeri* var. *dabneri***
3. ***L. hookeri* var. *elephina***
4. ***L. hookeri* var. *subfenestra***
5. ***L. hookeri* var. *susannae***
6. ***L. hookeri* var. *lutea***
7. ***L. hookeri* var. *marginata***
8. ***Lithops karasmontana* subsp. *karasmontana var. immaculata***
Recently described from N of Grünau, S Namibia

9 - 11. ***L. karasmontana* subsp. *karasmontana*** showing variation
12 & 13. ***L. karasmontana* subsp. *karasmontana* var. *aisaisensis***
14 & 15. ***Lithops julii* subsp. *rouxii*** showing variation




















***Lithops karasmontana* subsp. *karasmontana* var. *lericheana*.**




Two pictures Above: ***Lithops karasmontana* subsp. *karasmontana* var. *tischeri***





Lithops karasmontana* subsp. *bella Above left: A superb cluster of this most attractive species in habitat near Aus in sourthern Namibia. Right: two pictures of the species in cultivation




Lithops karasmontana* subsp. *eberlanzii two pictures showing pattern variation

twelve heads, usually up to five. However, subsp. *eberlanzii* produces up to fifteen heads or more, usually up to four and subsp. *bella* a staggering sixty or more but usually up to six. Flowers are white. The species occurs in a large variety of soil, rock and pebble types.

Distribution: Varieties *karasmontana*, and *aisaisensis* occur N and W of Grünau, The variety *lericheana* east of Grünau, subspecies *eberlanzii* just E of Lüderitz across to Aus and southwards to W of Witputs. The subspecies *bella* occurs in a N-S direction from S of Helmeringhausen to Witputs.

***Lithops lesliei* (N.E. Br) N.E. Br.** Only two subspecies are recognised in this the species which has by far the most extensive range of the genus. These are subsp. *lesliei* which has five varieties: *lesliei*, *hornii, mariae, minor, rubrobrunnea* and *venteri* and subspecies *burchelli*. This species, despite its many subspecies and varieties, is very distinctive and is easily recognised as being *L. lesliei*. The plant bodies are large and their colour varies extensively. The windows range from being heavily channelled with narrow dendritic lines through being extensively maculate to being completely open-windowed. Most of this taxa tend to have dark to light brown bodies with the exception of subsp. *venteri*, which is light milky grey through pale bluish to light pink and colour abberants which are green. Flower colour is yellow although there are examples of abberants with white flowers which occur occasionally. They produce clusters of up to ten heads, but usually two to four. They occur in many soil types.

Distribution: *Lithops lesliei* is widely distributed from a point W of Polokwane (Pietersburg) to W of Gaborone in Botswana, southwards to W of Kimberley, in a south easterly arch to Zastron and N to Harrismith.

***Lithops marmorata* (N.E. Br.) N.E. Br.** This attractive species has two varieties: var. *marmorata* and var. *elisae*. The plant bodies are pale grey, through bluish-grey, to pinkish. The windows are sometimes almost open and studded with small islands, to being narrowly channelled with large islands. Colours are darkish-green to deep pink. Produces clusters of up to twenty five, but usually two to six heads. Variety *elisae* produces clusters of up to eight, usually up to four heads. Flowers are white and can be quite large. Occurs in sand, between calcrete and gneiss outcrops.















Org Fritz















Robin Frandsen



1 - 4. ***Lithops lesliei subsp. lesliei* var. *lesliei***
(1) in habitat at Henley-on-Klip, south of Johannesburg
(2-4). Three pictures: showing colour and pattern variations of the species
5 & 6. ***L. lesliei* subsp. *lesliei* var. *hornii***
7. ***L. lesliei* subsp. *lesliei* var. *mariae***
8. ***L. lesliei* subsp. *lesliei* var. *minor***
9 & 10. ***L. lesliei* subsp. *lesliei* var. *venteri***
11. ***L. lesliei* subsp. *lesliei* var. *rubrobrunnea***
12. ***L. lesliei*** (fa. albinica) This pale yellow green colour form occurs in nature among normal plants, sometimes with yellow and sometimes white flowers
13 & 14. ***L. lesliei* subsp. *burchellii***
15 - 17. ***Lithops marmorata* var. *marmorata***
(15) in habitat north of Steinkopf
(16 & 17) in cultivation
18. ***L. marmorata* var. *elisae***







Distribution: *Lithops marmorata* is confined to an area from south of Vioolsdrif, S to Steinkopf and E to near Aggeneys. in the N Cape.

***LITHOPS MEYERI* L. Bolus** This is a little-known distinctive species. The plant body colour is opaque, greyish-white, to yellowish tinged, palest green to light pink. The windows are all but opaque, but are lighter-coloured than the body with a few obscure greenish channels. Flowers are yellow with white centres. The plants occur in quartz pebble-strewn fields. They produces up to five but usually one to two heads.

Distribution: *Lithops meyeri* occurs in a very small area in the Richtersveld, N and NW of Lekkersing.

***LITHOPS NAUREENIAE* D.T. Cole** This most attractive species is beautifully marked and some of the more occluded variations are quite reminiscent of *L. dorotheae* but lack that species' dots and rubrications. Plant body colours range from pale grey, through greenish to pinkish. The windows are usually almost occluded but sometimes with irregular broad to narrow islands Flowers are yellow with white centres. Forms clusters of up to twenty five or more heads but usually two to five. Occurs in broken gneiss pebbles.

Distribution: *Lithops naureeniae* occurs in a very small area about 50 km SW of Springbok. Only two populations are recorded. It is very rare in nature and should be introduced via horticulturally produced plants and seed as it is not common in collections.

***LITHOPS OLIVACEA* L. Bolus** This multi-clustering species is an old favourite and is common in collections. Two varieties are recognised, var. *olivacea* and var. *nebrownii*. Body colour varies from green to mauve and every shade in between. Windows are open often with channels and small islands. The windows are shades of bluish-green, green, grey or brown. Variety *nebrownii* is distinguished from var. *olivacea*, by its divergent fissure, which fissures are closely adpressed together in var. *olivacea*. Variety *olivaceae* forms clusters of sometimes more than thirty heads but usually three to ten and var. *nebrownii* thirteen or more but usually only two. Flowers are yellow with white centres. Occurs mostly in quartz pebble beds.

Distribution: *Lithops olivaceae* is found in a band from W of Pofadder to W of Aggeneys. The variety *nebrownii* occurs just W of Aggeneys. The species is endemic to South Africa.

***LITHOPS OPTICA* (Marl.) N.E. Br.** This is a coastal Namibian desert species. The body colour is greenish-grey with the windows usually open. Windows and channels are translucent greenish-grey or bluish. Rare in habitat but common in cultivation is the beautiful aberrant colour form 'rubra', which is probably the most sought-after plant of the genus. Flowers are yellow with white centres, variations exist where the petal tips are pink, sometimes suffused with pink or ruby-red. Occurs in sand, in gneiss, quartzite, sandstone and limestone rock crevices.

Distribution: *Lithops optica* is found in a narrow coastal strip extending from N of Lüderitz to the Boegoeberg, NW of the Orange River mouth.



Lithops olivacea* var. *olivacea in habitat north of Aggeneys in the Northern Cape Province showing the plant emerging from its hibernation
Photo Judd Kirkel





Lithops olivacea* var. *olivacea Above: showing the colour variation. Note the closely connivent lobes of this variety





Lithops olivacea* var. *nebrownii Above: showing the colour variation. Note the divergent lobes of this variety









Robin Frandsen

1. ***Lithops meyeri***
2 & 3. Lithops naureeniae Showing great variation in the apical patterning with many islands on the face of the one specimen a heavily occluded face on the other specimen
4 - 6. ***Lithops optica*** (4) in habitat in a resting state, north of Lüderitz, Namibia (5 & 6) Two clones showing apical patterning variation
7. ***L. optica* fa. *rubra*** in habitat south of Lüderitz, rare in habitat and much sought after by collectors











Lithops otzeniana Top: in habitat at Brakfontein north west of Loeriesfontein *Photo Robin Frandsen.*
Above: showing the typical 'scalloped' edges

LITHOPS OTZENIANA **G.C. Nel** This beautiful species is distinctive because of its 'scalloped' margins. The body colour is light grey to pinkish and the windows are translucent bluish grey, greenish and sometimes pinkish. Produces up to twenty heads but usually two to four. Flowers are yellow with white centres. The plants are usually found in weathered detritus in the crevices of gneiss outcrops.

Distribution: *Lithops otzeniana* is a purely South African species occurring in a small area around Brakfontein N and NW of Loeriesfontein.

LITHOPS PSEUDOTRUNCATELLA **(Berg.) N.E. Br.** This variable and widespread Namibian species contains five subspecies and with three varieties. Some of the plants are uncomfortably close in appearance to *Lithops ruschiorum*. The subspecies are, *pseudotruncatella, archerae* (the *L. ruschiorum* look-alike), *dendritica, groendrayensis* and *volkii*. The varieties in subsp. *pseudotruncatella* are *elisabethiae* and *riehmerae*. There are multitudinous variations of the colours of the bodies and windows, but none have open windows. The illustrations show the variation within the species which occur in a large variety of habitats. Flowers are yellow. Up to twenty heads are recorded in the species but usually three to four.

Distribution: This Namibian endemic occurs from Steinhausen in the N, in a westerly-tending swath to W of Kalkrand, with Windhoek at the centre of the distribution.

LITHOPS RUSCHIORUM **(Dint. & Schwantes) N.E. Br.** This Namibian species is attractive and unmistakable. Two varieties are recognised, var. *ruschiorum* and var. *lineata*. The difference between the two lies mainly in their colour and in the form of their markings. The flowers of var. *lineata* are also significantly smaller. The body colour is greyish-white or cream, sometimes pinkish or yellowish. The face is opaque usually with fine channels and pits, reddish brown in colour. The completely unmarked plants were previously known as *L. nelii.* These were smaller but with more moisture they grow to the same size as *L. ruschiorum*. That taxon has therefore not been upheld. Flowers are yellow. Forms clusters of up to thirty heads but usually up to five. This coastal species occurs in quartz and rose quartz pebbles and is cryptic in this habitat.

Lithops ruschiorum* var. *ruschiorum Above two pictures: showing patterning variation. ***L. ruschiorum* var. *lineata*** Bottom two pictures showing colour variation















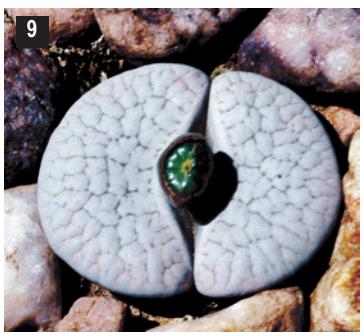




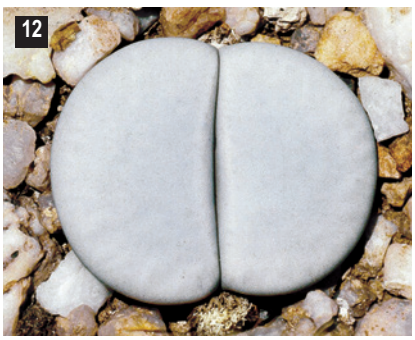












1 - 3. *Lithops pseudotruncatella* subsp. *pseudotruncatella* var. *pseudotruncatella*
4. *L. pseudotruncatella* subsp. *pseudotruncatella* var. *elisabethae*
5 & 6. *L. pseudotruncatella* subsp. *pseudotruncatella* var. *riehmerae*
7 & 8. *L. pseudotruncatella* subsp. *archerae*
9 - 11. *L. pseudotruncatella*. subsp. *dendritica*
12 & 13. *L. pseudotruncatella* subsp. *groendrayensis*
14 & 15. *L. pseudotruncatella* subsp. *volkii*









Distribution: Occurs in a narrow strip from Swakopmund to N of Cape Cross. The variety *lineata* occurs further N to the Angola border. It may even occur in Angola, although not yet recorded there.

LITHOPS SALICOLA **L. Bolus** This is a remarkable and very attractive multi-headed species occurring in or around the edges of brackish pans, where it is sometimes covered with water for quite long periods. It is also found on rocky calcrete ridges or slopes. Body colours are light greenish, through yellowish, pinkish or lilac grey. Windows are sometimes open with faint paler markings or with islands. Colour greenish- to bluish-grey. Flowers are white and can be relatively very large. Forms huge clusters of as many as fifty heads but usually up to five.

Distribution: *Lithops salicola* occurs in the southern Free State from Fauresmith to Koffiefontein and S to Petrusville in the Great Karoo.

LITHOPS SCHWANTESII **Dinter** Two subspecies are recognised within this very variable taxon, subsp. *schwantesii* and subsp. *gebseri*. Within subsp. *schwantesii* four varieties are recognised: these are varieties: *schwantesii, marthae, rugosa* and *urikosensis*. Their body colour is very variable, from greyish, to yellowish, through to pinkish. Windows are opaque with narrow channels to open with obscure reddish markings. The flowers are yellow. They form clusters of up to more than eighteen but usually up to five heads. Occurs in many habitat types.

Distribution: *Lithops schwantesii* is a Namibian endemic occurring in a band from a point about 120 km W of Mariental, S to Witputs.

LITHOPS TERRICOLOR **N.E. Br.** Formerly and currently popularly, but incorrectly, known as *L. localis*, this is, with the exception of *L. comptonii*, probably the most southerly-known *Lithops* species. It is distinguished by its heavily spotted face. Body colour is very variable from greyish through bluish, yellowish to brownish-red. Windows can be almost opaque to open with small islands. Windows and spots dull greyish-green. Flowers are yellow, sometimes with white centres. Found in many habitats. Produced clusters of up to twenty heads but usually two to five.

Distribution: Occurs across a wide band from Beaufort West across to Graaff-Reinet in the N and from Laingsburg in a line N of the Swartberg mountains, to Steytlerville in the E.

LITHOPS VALLIS-MARIAE **(Dinter & Schwantes) N.E. Br.** This beautiful species is characterised by its near-white body colour, truncate profile and minutely wrinkled face. The colours are pale grey-white, with sometimes shades of yellow, beige or pink. Channels are opaque, bluish-grey to brownish. Flowers are pale yellow sometimes tinged with bronze, or pink. Forms clusters of in excess of ten heads, but usually up to four. Its habitat is quartzite, calcrete and sandstone.

Distribution: *Lithops vallis-mariae* is an endemic Namibian species found in a large quadrangular area bounded by



Lithops vallis-mariae Two variations













1 - 3. ***Lithops salicola*** (1) a maculate form. (2 & 3) Immaculate clones Colours range from purple to green.
4. ***Lithops schwantesii*** **var. *schwantesii.***
5. ***L. schwantesii*** **var. *marthae.***

6. ***L. schwantesii*** **var. *rugosa***
7 & 8. ***L. schwantesii*** **var. urikosensis**
9. ***L. schwantesii*** **var. *gebseri***
10 - 12. ***Lithops terricolor***: Three colour and pattern forms













Beerseba and SE to near the South African border, northwards to Stampriet and to W of Mariental—a region devoid of any other *Lithops* species.

Lithops verruculosa **G.C. Nel** This is a distinct and widepread species with two recognised varieties: var. *verruculosa* and var. *glabra*. The distinguishing character is the presence of innumerable verruculae or pimples on the face. The extremely variable colours of the bodies range from opaque grey through beige, yellowish, greenish or bluish. faces are translucent greyish, brownish through to greenish or bluish. Channels or rubrications are dark blood-red to purplish-red. Pimples are shiny brown or red. Unique to this species is the extensive range of colours found in the flowers, which range from golden yellow through dark yellow, pale orange, bronze, shell-pink, rose and near white. Produces clusters of up to eight or more, but usually two to four. Found in a large variety of habitats.

Distribution: Occurs in a large range from NW of Williston, west to Vosburg and in a looping arch with Kenhardt in the N, to S of Pofadder in the west.

Lithops villetii **L. Bolus** Three subspecies are recognised: *villetii, deboeri* and *kennedyi*. This fairly localised species is characterised by its grey-green, brownish or pinkish colour with distinct margins and mostly open windows. Windows and channels are various shades of greyish-green to bluish through pinkish or brownish. Flowers are white. Produces up to eight or more heads, but usually up to four. Found in shale, quartzite or calcrete.

Distribution: Occurs in a band from N of Loeriesfontein, west, to N of Kliprand for subsp. *villetii* and in a restricted area about 100 km S of Pofadder for subsp. *deboeri*.

Lithops viridis **H. Lückhoff** Plant body colour greyish-pink to green or beige. Windows translucent greyish-blue to greyish-green. Flowers yellow with a white centre. Forms clumps of up to eight or more heads, but usually up to four. The habitat is weathered chert and shale.

Distribution: *Lithops viridis* occurs in a very limited area to the S of Loeriesfontein. It has not yet been reported elsewhere but it can possibly occur E of its present locality.

Lithops werneri **Schwantes & Jacobs** This attractive very small Namibian endemic is pale and opaque grey or greenish grey sometimes pinkish-tinged with the faces translucent greenish-grey to light brown, orange-brown or greenish-grey, with grey-green dots and reddish-brown rubrications. Flowers are yellow and very small to medium. The habitat is in weathered granitic gravel. Forms clusters of up to ten heads but usually two to three.

Distribution: *Lithops werneri* is known from only one locality: N of Usakos, S of the Erongo Mountains.



Lithops werneri from S of the Erongo Mountains, Namibia

Meyerophytum Schwantes

This charming genus consists of two species, although the recent transfer of *M. globosum* from *Monilaria* does not seem to have sufficient reason for that transfer.

Meyerophytum meyeri **(Schwantes) Schwantes** The plants form compact, freely-branching tufts of two trigonous leaves united for about half their length and thereafter diverging into 2 obtusely-keeled leaves which are covered with shiny bladder cells. Their colour is green, with the apices sometimes tinged with brown. The flowers are large and showy, pink to purple with white centres.

Distribution: Occurs on the wide flats between Anenous Pass and Port Nolloth, northwards to S of Alexander Bay and S to near Hondeklip Bay.

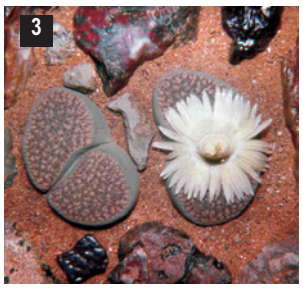
Mitrophyllum Schwantes

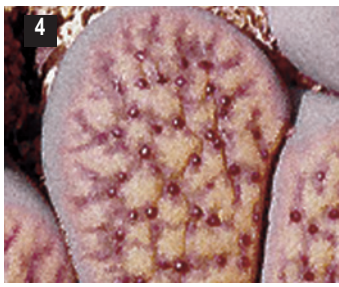
This interesting genus is named for its appearance as that of a bishop's mitre. This is a small shrub with articulated stems and cylindric, long tapering leaves. The first leaves of the season are a little connate, with the second very connate, with only a short section dividing. The flowers range from white to yellow to pinkish red. Two species of six are discussed here.



Nico Myburgh







1 - 4. ***Lithops verruculosa* var. *verruculosa***
(1) in habitat south of Brandvlei
(2 & 3) in cultivation (4) Close-up showing the pimpled surface (verrucae)
5 & 6. ***L. verruculosa* var. *glabra***
7. ***Lithops villetii*** subsp. ***villetii***
in habitat north of Loeriesfontein
8. ***L. villetii*** subsp. ***villetii*** in cultivation
9. ***L. villetii*** subsp. ***deboeri***
10 & 11 . ***Lithops viridis***
12 & 13. ***Lithops villetii* subsp. *kennedyi***
14. ***Meyerophytum meyeri***
in habitat W of Springbok





Robin Frandsen











Priscilla Burgoyne SANBI







Mitrophyllum clivorum **(N.E. Br.) Schwantes** This species grows up to about 60 cm tall. The branches are brown, turning grey. The leaves are light green. The first pair is much longer than the second and is only shortly connate. The second pair, produced within the first pair is connate for about 1/2 to 2/3 from which the long-pedicelled yellow or white-pink flowers are produced.

Distribution: NW of the N Cape in the Richtersveld.

Mitrophyllum grande **(Marloth) Schwantes** This is a compact shrub which has short stalks surmounted by long cylindric leaf-bodies, connate for about 2/3 and then dividing into 2 trigonous lobes, obtusely keeled on the outside with acute edges to the lobes and flat on the inside. The old leaves are persistent. The leaves are green to yellowish-green. The flowers are sessile between the lobes and are coloured white or yellow.

Distribution: Occurs in a restricted area of SW Richtersveld in the N Cape.

Mitrophyllum mitratum **(Marloth) Schwantes** This species grows up to about 60 cm tall. Its growth form is variable, from lax branches to tall sub-erect plants. The first pair of leaves are connate for only a short distance, with the second connate up to 2/3 with the erect two lobes somewhat incurved. The flowers are white, sometimes purplish.

Distribution: In a somewhat more restricted area in the SW Richtersveld, N Cape.

Monilaria (Schwantes) Schwantes

These are sparsely branched, deciduous shrublets with shortened branch-nodes constricted into bead-like segments. Two leaf-forms are produced per season, with the first being like a small rounded body and the second, produced from the first into an elongated pair. The flowers are highly-scented and open at midday and close in the late afternoon.

Monilaria chrysoleuca **(Schultr.) Schwantes** This species forms large clumps, with the green second leaves elongated and covered with large, prominent water cells. The flowers are produced on a long pedicel, are very showy and range from white through to salmon coloured.

Distribution: The quartzite flats of the Knersvlakte.

Muiria N.E. Br.

This is a monotypic genus which has recently been incorporated into *Gibbaeum* as *G. muirii*. This plant, as I and others believe, is sufficiently distinct to remain in its own genus and we do not uphold its transfer. Its flowering time overlaps rather shortly with that of *Gibbaeum album* with which it grows sympatrically and an intergeneric hybrid is sometimes encountered. It was described as X*Muiriogibbeum muiroides* H. Jacobsen. Flowers are open for most of the day.

Muiria hortenseae **N.E. Br.** This strange ovoid, densely pubescent mesemb grows in dense colonies in a very limited area and in dense quartz patches. It is found growing closely associated with *Gibbaeum album* and *G. petrense*. The two leaf bodies are completely united with a very small, rarely distinguishable, slit separating the two leaf bodies. The

Priscilla Burgoyne SANBI


7

Robin Frandsen


8



Gerhard Beukes



Gerhard Beukes

Bob Chinnock



Robin Frandsen



1 & 2. ***Mitrophyllum clivorum*** in habitat at Helskloof, Richtersveld.
3. ***Mitrophyllum grande*** in habitat 11 km S of Lekkersing, Richtersveld
4. ***Mitrophyllum mitratum*** in habitat 15 km E of Port Nolloth,
5 & 6. ***Monilaria chrysoleuca*** in habitat on the Knersvlakte
7 - 10. ***Muiria hortenseae*** (7) in flower in habitat at Springfontein, S Little Karoo. (8 & 9) in habitat, in close association with *Gibbaeum album*, these are the two parent plants of the putative hybrid X*Muiriogibbaeum muiroides*:
(10) **X*Muiriogibbaeum muiroides***, note the whitish-green colour and also the fissure which is not seen in the nearby *Muiria* parent (top right of the photograph)



Priscilla Burgoyne SANBI

Priscilla Burgoyne SANBI



Robin Frandsen



Robin Frandsen



smallish flowers, which are pinkish-white, usually force their way out, not through the slit, but through the sides of the bodies. The soft green bodies are sheathed by the previous year's desiccated growth through its long resting period. The flowers appear at the end of the season, when the plants are already dying down and are turning yellowish, prior to their resting period. This plant requires special treatment, with plenty of light if it is to be successfully cultivated.

Distribution: *Muiria hortenseae* and the hybrid occur in the S Little Karoo around Springfontein, where it inhabits dense quartz patches in a very limited range.

NAMAQUANTHUS L. Bolus

This monotypic genus has erect, glabrous, finger-like leaves with branches covered with dried persistent old leaf growths. The flowers open in the morning and close in the evening.

NAMAQUANTHUS VANHEERDEI **L. Bolus** This rare species forms small to large compact groups of rounded, inwardly-curving, finger-like bluish-green to green to yellowish, glabrous leaves which are united near the base into a sheath around the branches. They are up to about 30 cm tall. The large showy flowers are purple to pink.

Distribution: Confined to a small area N of Springbok.

NAMIBIA (Schwantes) Schwantes

This is a highly-succulent genus which forms compact, semi-globose bodies. With *Dracophilus* this genus was originally included under *Juttadinteria.* Flowers open in the morning and close in the evening.

NAMIBIA POMONAE **(Dinter) Dinter & Schwantes** This small succulent forms cushions of up to about 20 cm in diameter and about 10 cm high. The semi-globose leaf-bodies are light green and are papillate, which makes them velvety to the touch. The flowers are white. It is not certain at this stage whether this species is conspecific with the only other species in the genus, *N. cinerea*, where the only difference is that its leaves are smoother and more velvety to the touch.

Distribution: Occurs in a restricted area near to the E and SE of Lüderitz, Namibia.

NANANTHUS N.E. Br.

These are compact plants with thick turnip-shaped roots. The leaves of the plants are covered with wart-like excrescences. The calcium oxalate deposits under the epidermis give the leaves the appearance of being white-spotted. The flowers are large and showy.

NANANTHUS ALOIDES **(Haw.) Schwantes** This species lies flat on the ground, with branches, comprising usually 4 leaves, being produced directly from the rootstock, The broad triangular leaves are spreading and almost flat on the ground. The surface is pale green covered with warts. The flowers are yellow, sometimes with a red stripe down the centre.

Distribution: Occurs from SW Botswana into South Africa, southwards to the Orange River and across to Upington.

NANANTHUS POLE-EVANSII **N.E. Br.** This species has 2 to 3 leaf-pairs which grow close to the earth, with the underside keeled, somewhat boat-shaped and abruptly upturned into a hump with an inward-pointing apical point. The leaves are green and transversely papillate. The flowers are yellow, sometimes with a deep-red sometimes dark vinous-red stripe.

Distribution: Occurs from Prieska in the W across to the Free State and S to the E Cape.

NANANTHUS VITTATUS **(N.E. Br.) Schwantes** The leaves of this species are not as ovate as those of *N. aloides.* The leaves tend to be more erect as well. The colour is green to brownish but usually always green towards the base of the leaves. the leaves are warty, with greater concentrations on the margins and undersides. The flowers are shining light yellow.

Distribution: Occurs from the SW Free State, northwards to the W of the North West Province.

NELIA Schwantes

This highly succulent genus has been reduced to 2 species from the original 5. The species *N. meyeri,* which has been included under *N. pillansii,* has its leaves more cylindrical (see illustration). The plants form clumps or domes. Leaves are waxy and grey to greyish-green. The flowers open for the first time in the morning and then do not close again.



Bob Chinnock



Priscilla Burgoyne SANBI



Gerhard Beukes



Judd Kirkel Welwitch

Judd Kirkel



1. ***Namaquanthus vanheerdii*** in cultivation
2 & 3. ***Nananthus aloides*** (2) in habitat near Postmasburg Griqualand West (3) in habitat in Griqualand West
4 & 5. ***Nananthus vittatus*** in cultivation
6. ***Nananthus pole-evansii*** in habitat near Cala, SW of Eliot, E Cape
7. ***Namibia pomonae*** in habitat in the Sperrgebiet, south of Lüderitz, Namibia

Priscilla Burgoyne SANBI



Valentino Vallicheli



Nelia pillansii **(N.E. Br.) Schwantes** This species forms clumps of pale greenish keeled trigonous leaves with rounded keels. The leaves vary from having sharp to well-rounded keels. The flowers are white and are continuously open.

Distribution: In and around the Oograbies Mountains, E of Port Nolloth.

Neohenricia L. Bolus

This genus comprises two species, which are characterised by their low-growing habit, forming low mats of many heads, The truncate carunculate apices of the leaves are characteristic. The long-lasting sweet- and strongly-smelling small flowers open in summer, opening at twilight and closing before dawn.

Neohenricia sibbettii **(L. Bolus) L. Bolus** This small, flat and compact mat–forming species grows around the peripheries and on the tops, in shallow, sand–filled hollows in sandstone domes. They are found in association with *Crassula corallina*. The little leaf bodies are glabrous, greyish-green and the apices are carunculated caused by the encrustation of lime oxalate, giving the impression of being frosted. The flowers are small, yellowish-white, suffused with pale pink, especially towards the apices of the petals. The small flowers are strongly sweet–smelling and are probably pollinated by nocturnal moths.

Distribution: Patchily distributed in the S Free State, N of Philippolis, near Bethulie and near Hanover, N Cape.

Neohenricia spiculata **Hammer** This is a small mat-forming species, which is more caespitose that *N. sibbetii*. The leaves are somewhat clavate and triquetrous and covered with small warts. The leaf-colour is dark-green, sometimes tinged with brown along the keels. The larger flowers are pale lime-green in colour to pink. There still seems to be some doubt as to whether this species really belongs in *Neohenricia*.

Distribution: This species has a very limited distribution near Sterkstroom in the E Cape.

Odontophorus N.E. Br.

The plants of this genus form small clumps or mats with the exception of *O. angustifolius* which forms large cushions. The leaves have large teeth along the margins towards and at the apices. The strongly-scented flowers open around noon and close in the early evening.

Odontophorus angustifolius **L. Bolus** This species forms large mats, in exceptional cases, of up to 3 m in diameter, though usually much smaller. The leaves are green to reddish and thicker than the other species. The shape is rounded-triquetrous, spreading into a prominently-toothed apex. The teeth are usually reddish-tipped. The shiny-yellow, showy flowers are strongly-scented, open from midday to dusk and are produced in early spring. One subspecies is recognised, *O. angustifolius* subsp. *protoparcoides*, with the difference being that it is smaller, with more slender growth and with pungent recurved black teeth.

Distribution: Near Kosies in the E Richtersveld. The sub-species *protoparcoides* occurs to the N of the nominate species.

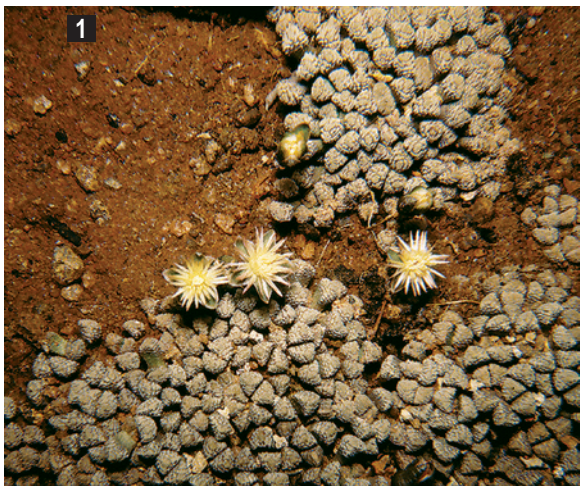
Odontophorus marlothii **N.E. Br.** This is a mat-forming species with a compact centre of erect branches with outwardly-spreading lateral decumbent branches. Leaf pairs are connate and decussate, with 3—4 pairs per branch. Leaves are triquetrous, with a few teeth on the upper margins of the keels. They are grey to dark-green and are covered with fine whitish-hairy tubercles. Flowers are bright yellow sometimes with a white centre.

Distribution: Occurs from near Steinkopf, SW towards Koufontein.

Odontophorus nanus **L. Bolus** This is a variable, small,

Odontophorus marlothii in cultivation *Photo Bob Chinnock*





Robin Frandsen



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Bob Chinnock



Priscilla Burgoyne SANBI



Bob Chinnock



Bob Chinnock

1 & 2. *Neohenricia sibbettii* (1) at night in habitat at the presumed type locality, S of Fauresmith, S Free State.
(2) In habitat, near Hanover, SW of Colesberg, Great Karoo
3 - 5. ***Neohenricia spiculata***
(3 & 4) in habitat near Sterkstroom, NW of Queenstown, E Cape.
(5) in cultivation
6 & 7. ***Odontophorus angustifolia*** in cultivation
8 & 9. ***Nelia pillansii*** in cultivation

Bob Chinnock



Priscilla Burgoyne SANBI



compact tuft-forming species, scarcely 5 cm in diameter. The leaves are velvety with short papillae, pale whitish-green, but rarely smooth and shiny. The apices of the leaves are flattened and triangular with teeth. The flowers are light yellow, creamy and sometimes white.

Distribution: Occurs from about Springbok to N of Steinkopf in the Richtersveld.

Oophytum N.E. Br.

This genus is named for the oval, egg-shaped, leaf-bodies with only a narrow apical slit to allow for anthesis. They form small clumps and are green, colouring red in heat-stress. The flowers are open from about midday to late afternoon.

Oophytum nanum **(N.E. Br.) Schwantes** This is a very small species with the ovoid bodies barely 7 mm in diameter. The bodies comprise 2 connate leaves separated by a short slit. The colours are green to purple with heat stress and with almost invisible papillae. Flowers are cerise with white centres.

Distribution: Similar to the next species but is concentrated at the dry hills of the N Knersvlakte.



Oophytum nanum in habitat in the quartzfields of the Knersvlakte, showing the plant descending into the resting stage. Picture on the right showing an unusual white-flowered specimen *Photos Judd Kirkel Welwitch*

Oophytum oviforme **(N.E. Br.) N.E. Br.** Forms clumps of small ovoid obtusely keeled leaf-bodies, up to about 12 mm in diameter, which are olive green, becoming red due to heat-stress, covered with small whitish bladder cells. Flowers, which open at midday and close at about 5 pm, are white or cerise, with white centres, with the new flower bud forcing the dividing slit apart. The species previously described as *O. nordenstamii* is conspecific with *O. oviforme*.

Distribution: Inhabits the central and W central Knersvlakte in the extensive quartz fields, the home of the genus *Argyroderma*, and N towards Bitterfontein.

Orthopterum L. Bolus

This is a dwarf, branching, compact genus with slightly anisophyllous leaf-bodies.

Orthopterum coeganum **L. Bolus** This species forms clumps with branches having 6—8 leaves. The linear to lanceolate leaves are obtusely trigonous and smooth with a sharp apical tip. The leaves are green to reddish with dark obscure spots. The flowers are golden-yellow.

Distribution: Grow in the shade of bushes in the Albany region from Coega to Uitenhage in the E Cape.

Orthopterum waltonii **L. Bolus** This species has leaves which are more slender than the previous species. It is often found scandent in other shrubs. The internodes may be long. The leaves are green and velvety with short papillae, with short brittle teeth on the margins. The flowers are bright yellow and occasionally with a white centre.

Distribution: Occurs near Albany in the E Cape near Fort Brown NW of Grahamstown.

Oscularia Schwantes

This genus is closely related to *Lampranthus*, from which many of its species have been excised and included in *Oscularia*. It can be regarded as one of the shrubby, genera which are not included here. However, the stunning floral display of many of its species warrants mention and description of one of its very floriferous members. The plants have mainly spreading to decumbent branches, but some are erect. The leaves are trigonous and thicker than broad and keeled. The leaves are covered with a waxy layer.



Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



Robin Frandsen



Robin Frandsen

1 & 2. ***Odontophorus nanus*** in habitat near Bulletrap, NW of Springbok, N Cape
3 & 4. ***Oophytum oviforme*** in habitat in the central Knersvlakte
5. ***Oophytum nanum*** (see opposite)in habitat in the central Knersvlakte - smaller plant, growing in close association with the larger *O.oviforme*
6 & 7. *Orthopterum coeganum* in habitat at Coegakop, near Coega, E Cape
8. ***Orthopterum waltonii*** in habitat in the Ecca Pass, NE of Grahamstown .

Priscilla Burgoyne SANBI



Robin Frandsen

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

Priscilla Burgoyne SANBI





Oscularia lunata **(Willdenow) H.E.K. Hartmann** This species is decumbent with many slender branches. The leaves are glaucous-green, lunate, curving inwards and keeled with erect mucrons. The keel sides are widened and the edges are blunt. Their colour is green with reddish margins. The showy, proliferous flowers are pink, through red to purple, slightly darker towards the centre.

Distribution: In the Clanwilliam towards Saldana Bay and in the Vanrhynsdorp district.

Peersia L. Bolus

This genus has previously been treated as being conspecific with *Rhinephyllum*. This has been rejected as the factors given for that transfer are insufficient to justify this. The plants of this genus consist of compact to caespitose cushions which sometimes form large patches, with old leaves remaining on the stems and blackening with age.

Peersia frithii **(L. Bolus) L. Bolus** The plants are compact, forming cushions, with the leaves being spreading, glabrous, triquetrous with sharpish keels with stout teeth and pointed. Their colour is green to pinkish-green. The flowers are golden-yellow.

Distribution: Occurs from Aberdeen in the Great Karoo to Prince Albert.

Peersia vanheerdei **(L. Bolus) H.E.K. Hartmann** Plants form large mats of up to about 2 m in diameter. The leaves are obtusely trigonous, blunt-ended. Green to pinkish-green. The flowers are yellow.

Distribution: Occurs from near Calvinia and S through the Ceres Karoo.

Phyllobolus resurgens Left: in habitat at Matjesfontein *Photo Robin Frandsen*. Right: in habitat at Beaufort West *Photo Priscilla Burgoyne SANBI*





Phyllobolus N.E. Br.

This is a large genus comprised mainly of weedy species. For interest one species, which is interesting in appearance, has been included here. The genus *Dactylopsis* has been previously transferred to *Phyllobolus*, but this work does not recognise the transfer and it has been widely rejected. It has therefore been treated as its original separate genus.

Phyllobolus resurgens **(Kensit) Schwantes** This is a dwarf, compact tufted species with long cylindric alternate leaves which are covered with large bladder cells. Their colour is pale green. The branches are produced from a tuberous caudex. The flowers are pale yellow, winter-flowering and diurnal.

Distribution: Occurs widely from Calvinia, to Clanwillian, through to Matjiesfontein and across to Willowmore.

Pleiospilos N.E. Br.

This very succulent genus comprises fairly large plants, the bodies of which are almost globose, to bodies with flattened decumbent leaves. The leaves are characterised by the presence of numerous dark tannin idioblasts on the leaves. Hartmann & Liede retained 4 species and created a new genus *Tanquana* to accommodate the excised taxa. The sweetly-smelling flowers are open from the mid-afternoon to very late afternoon.

Pleiospilos bolusii **(Hook.f.) N.E. Br.** This stone-like species is usually solitary but rarely producing up to about four branches. The strongly keeled leaf-body, which may be up to 7 cm broad across the keel, is divided almost to the base and is spreading and hooded. The grey-green bodies are profusely dotted. The flowers are large, showy and golden-yellow, very rarely a white abberant can be found.

Distribution: Occurs from near Graaff-Reinet, southwards towards Steytlerville and across to Beaufort West.

Pleiospilos compactus **(Aiton) Schwantes** This is a very variable species. The leaves have a long keel and are deeply divided and hooded. They are green to grey and may be reddish due to heat-stress. Their length may be up to 4 cm. The flowers are bright yellow to pinkish-white. Several subspecies are recognised. The most important,



Robin Frandsen



Bob Chinnock



Judd Kirkel Welwitch

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch

Robin Frandsen

1. ***Oscularia lunata*** in habitat on the Gifberg, S of Vanrhynsdorp, included to show the typical form of the flowers of this genus
2. ***Peersia frithii*** in habitat N of Laingsburg
3. ***Peersia vanheerdei*** in habitat
4 - 6. ***Pleiospilos bolusii*** (4) in habitat near Steytlerville, closely mimicking the surrounding pebbles. (5) ('Envy' - white flower) in cultivation. (6) In cultivation
7. ***Pleispilos compactus*** **subsp.** ***compactus*** in habitat near Calitzdorp, Little Karoo
8 & 9. (8) ***P. compactus*** **subsp.** ***canus*** in habitat near Prince Albert, (9) near Victoria West
10. ***P. compactus*** **subsp.** ***minor*** in habitat at Klipplaat, near Willowmore



Priscilla Burgoyne SANBI





and probably more acceptable, are subsp. *compactus*, subsp. *canus* and subsp. *minor* are here illustrated. The subspecies *compactus* is distinguished by its lack of sub-apical bulges to the sides of the leaves; *canus* is a very variable species and distinguished by its 12–locular fruit; *minor* is smaller with short, broad leaves.

Distribution: The subspecies *canus* occurs near Prince Albert, across to the Little Karoo and across to Mossel Bay. The subspecies *compactus* occurs in the Steytlerville district. The subspecies *minor* occurs in the vicinity of Steytlerville.

PLEIOSPILOS NELII **Schwantes** This species, together with *P. bolusii*, represents the acme of succulence and is a true epitome of a 'living stone'. With *P. bolusii*, its flowering time differs radically with the other *Pleispilos* members. This is a solitary compact plant with an almost spherical, keel-less, grey, sometimes reddish, much spotted leaf-body with a separating slit which opens only when the new growth is extruded. The large showy flowers are yellow to salmon pink.

Distribution: Occurs between Prince Albert and Willowmore and northwards towards Beaufort West.

PLEIOSPILOS SIMULANS **(Marloth) N.E. Br.** This species has leaves which are widely spread to flat on the ground and up to 8 cm long and are tongue-shaped, ovate, triangular and flat, with the back keeled. The colour is grey-green, or yellowish to brownish in strong sun, and heavily spotted. The showy flowers are light yellow to yellow to orange.

Distribution: Occurs from E of Calvinia, across to Willowmore, Jansenville and northwards towards Beaufort West and Aberdeen.

PREPODESMA N.E. Br.

This monotypic species was formerly transferred by Mrs Bolus to the genus *Aloinopsis*., but it has since been restored back to *Prepodesma* by Heidi Hartmann. The flowers open in the afternoon.

PREPODESMA ORPENII **(N.E. Br.) N.E. Br.** Formerly and better known as *Aloinopsis orpenii* this is a thick clump-forming species with crowded papillate leaves, which are triquetrous, forming a relatively sharp keel with an apicular mucron. They are green to grey in colour with the keels tinged with brown. The flowers are large and showy, yellow with a reddish tinge to the tips of the petals.

Distribution: Occurs from Griquastad N towards Kuruman in the N Cape.

PSAMMAPHORA Dinter & Schwantes

This interesting desert-dwelling genus is compact with trigonous to triquetrous leaves. The leaves are sticky and wind-blown desert sand adheres to the surfaces, making the camouflaged plants somewhat difficult to spot on the stony sandy areas which they inhabit. The scented flowers open at about noon and close at dusk.

PSAMMAPHORA LONGIFOLIA **L. Bolus** This species has long triquetrous leaves which are club-shaped, keeled towards the apex. The leaves are greenish-grey with pitted surfaces. The wax coated sticky surface is usually covered with sand in habitat. The illustration is of the previously-described *P. herrei* which has been included in this species. The flowers are white.

Distribution: Occurs from around Lüderitz in Namibia to just N of the Orange River in W Richtersveld.

PSAMMAPHORA MODESTA **(Dinter & Berger) Dinter & Schwantes** This is a shrubby species about 5 cm high which produces its leaves only at the end of the branches. The green leaves are triquetrous and somewhat warty. The epidermis is sticky, allowing the leaves to be well-covered with blown sand. The flowers are purple to pink with the base sometimes white.

Distribution: Occurs from N of Lüderitz to the Haalenberg Mountains and southwards narrowly into the W Richtersveld.

PSAMMAPHORA NISSENII **(Dinter) Dinter & Schwantes** This species is compact and, in nature, its branches and most of the leaf are buried in the soil with only the tops exposed. The leaf-surfaces are sticky and the plant is usually camouflaged with adhering sand. The leaves are somewhat clavate with obtuse margins. They are grey-green, whitish or reddish. The winter-flowers are white or rarely violet.



Bob Chinnock



Bob Chinnock



Priscilla Burgoyne SANBI



Bob Chinnock

1. ***Pleiospilos nelii*** in cultivation
2 & 3. ***Pleiospilos simulans*** in cultivation
4 & 5. ***Prepodesma orpenii*** (4) in habitat near Kuruman (5) in habitat near Postmasburg
6. ***Psammaphora longifolia*** in habitat in SW Namibia
7 & 8. ***Psammaphora modesta*** in habitat near Beauvallon, NW Richtersveld
9. ***Psammaphora nissenii*** in habitat S of Lüderitz



Priscilla Burgoyne SANBI



Bob Chinnock

Judd Kirkel Welwitch



Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



Distribution: Occurs in the desert region of S Namibia from the Kovisberge, E of Lüderitz southwards to E of Pomona.

Rabiea N.E. Br.

Plants of this small genus forms rosettes from thickened fleshy, tuberous roots. The very succulent, usually falcate leaves are prominently dotted with raised white or dark-green papillae. The solitary flowers open in the afternoon.

Rabiea albipuncta **(Haw.) N.E. Br.** Easily confused with a *Nananthus* when not in flower, the leaves are trigonous, somewhat sickle-shaped (falcate) with an acute apex. The leaves are green to grey-green and are prominently dotted with raised white papillae. The showy flowers are lemon-yellow.

Distribution: Occurs in the region of Aliwal North in the N Great Karoo to Petrusville in the N Great Karoo and N to Bethulie in the Free State.

Rhinephyllum N.E. Br.

These charming flat to caespitose, compact to mat-forming, dwarf, multi-leaved, triquetrous plants, have leaves with slightly-raised dots. They are covered with a thickish layer of fine oxalate crystals and wax. The solitary flowers open in the late afternoon or evening.

Rhinephyllum graniforme **(Haw.) L. Bolus** This species forms rather flat cushions up to about 8 cm in diameter. The small, pale green leaves are not strongly adpressed. Flowers are yellow.

Distribution: Occur on shaly soil between Beaufort West and Prince Albert in the Great Karoo.

Rhinephyllum graniforme in habitat S of Beaufort West
Photo Priscilla Burgoyne SANBI



Rhinephyllum inequale **L. Bolus** This small shrub forms compact mats, The grey-green to blue-green leaves are trigonous to clavate with acute apical, somewhat incurved keels. The leaves are rough-tuberculate. Flowers are lemon-yellow.

Distribution: Occurs around Kendrew, S of Graaff-Reinet.

Rhinephyllum muirii **L. Bolus** This small, very compact species forms mats of many heads. The triquetrous leaves have acute margins and are green to brown, with raised whitish papillae. The flowers are white to lemon-yellow.

Distribution: Occurs in shale and in the extensive quartz fields of the W Little Karoo, N of the Warmwaterberg.

Rhinephyllum parvifolium **L. Bolus** This species forms compact mats or cushions of many heads. The leaves are longer than *R. muirii* and are subglobose, dark green and densely covered with raised whitish papillae, giving the leaves a frosted appearance. The Flowers are yellow.

Distribution**:** Occurs from Kendrew, S of Graaff-Reinet S towards Jansenville.

Rhinephyllum pillansii **N.E. Br.** This is a charming mat-forming species with green to brownish leaves which are densely covered with raised white papillae. The frosted leaves make this plant very prominent in habitat. The leaves are spathulate, short at the base and spreading to a wider keeled apex. The flowers are golden-yellow.

Distribution: Occurs in the Laingsburg and Matjiesfontein district.

Rhinephyllum rouxii **(L. Bolus) L. Bolus** This is a compact plant with a thick rootstock which is similar in appearance to a stomatium. The floral branches are densely 4—6 leaved. The green leaf-pairs are unequal, clavate to clavate-spathulate, with a small apicular point. The under-surface is keeled, the sides of the leaves sometimes with a pointed tooth. The surface is papillate. Flowers are bright-yellow.

Distribution: Between Carnarvon, Colesberg and Victoria West in the Great Karoo.



Priscilla Burgoyne SANBI



Bob Chinnock



Nield Jacobsen

1. *Rabiea albipuncta* in habitat near Smithfield, Free State Province
2. ***Rhinephyllum inequale*** in habitat on the Pearston Commonage, E Cape
3 & 4. ***Rhinephyllum muirii*** in habitat in the SW Little Karoo, (4) note the association with *Gibbaeum nuciforme*
5. ***Rhinephyllum parvifolium*** in cultivation
6 & 7. *Rhinephyllum pillansii* in habitat near Prince Albert Road, Great Karoo
8 & 9. ***Rhinephyllum rouxii*** (8) in habitat near Colesberg, central Great Karoo
(9) In habitat S of Middelburg, central Great Karoo



Robin Frandsen

Robin Frandsen



Priscilla Burgoyne SANBI

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI







Priscilla Burgoyne SANBI

Rhombophyllum (Schwantes) Schwantes

This is a low-growing genus with its members forming tufts or growing singly with densely branched boat-shaped leaves. Flowers open in the afternoon or evening.

***Rhombophyllum dolabriforme* (L.) Schwantes** This species, when young, forms small tufts but becomes shrubby and untidy when old when it grows up to about 30 cm. The leaves are laterally flattened, hatchet-shaped and always incised, green to brownish with transparent dots. The flowers are golden-yellow.

Distribution: Occurs from Graaff-Reinet, southwards to Willowmore.



Rhombophyllum dolabriforme in habitat near Graaff-Reinet
Photo Priscilla Burgoyne SANBI

***Rhombophyllum rhomboideum* (Salm-Dyck) Schwantes** This is a small, compact, little-branched species with distinctive boat-shaped prostrate green leaves which are often twisted. The margins are cartilaginous and with white spots. The flowers are golden-yellow on long pedicels.

Distribution: This is a more coastal species occurring around the Port Elizabeth, Coega area.

Ruschianthus L. Bolus

Ruschianthus is a monotypic genus, somewhat reminiscent of *Rhombophyllum* with its boat-shaped falcate leaves. This however is where the similarity ends because of the morphological differences in the vegetative and floral features as well as distribution.

***Ruschianthus falcatus* L. Bolus** The plants form up to 10 branches of whitish-green sickle-shaped (falcate), apiculate leaves. Their whitish colour is due to a smooth wax coating. The flowers are greenish-yellow which is unique in the non-weedy mesembs.

Distribution: Occurs endemically in Namibia, where it is confined to a small area just N of the Richtersveld Grootderm curve of the Orange River.

Saphesia N.E. Br.

This monotypic genus is included here for interest sake as it is regarded as one of the most endangered and rare of the mesembs. It is a perennial or biennial plant with deciduous branches and a thick rootstock.

***Saphesia flaccida* (Jacquin) N.E. Br.** This plant has a woody branched stem with deciduous somewhat lax, branches, The green leaves are long flattish, slender connate, linear/lanceolate and flaccid. The terminal solitary flowers are on a long pedicel and are showy and white.

Distribution: Occurs in a very limited area at Kalbaskraal, near Malmesbury in the Swartland in the SW Cape, where it is severely endangered due to the extensive wheat farming in the district.

Schwantesia Dinter

Plants of *Schwantesia* form compact mats of numerous branches with clusters of long leaf pairs. Most leaves are keeled at the back, being more or less triangular in cross-section and often skewed. Flowers are short-stalked and are yellow, very rarely white. The flowers open around mid-afternoon and close at nightfall.

***Schwantesia acutipetala* L. Bolus** This species forms compact mats. The leaves are long, triangular in cross-section, acutely margined and with an apical sharp point. The leaves are somewhat skewed as can be seen in the illustration. Their colour is green to bluish-grey with the edges sometimes reddish. Flowers are bright yellow.

Distribution: Occurs from the N Richtersveld on either side of the Orange River, across to Warmbad in Namibia and south to W of Pofadder.



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Ernst van Jaarsveld



Bob Chinnock

1 & 2. ***Rhombophyllum rhomboideum*** in habitat at Algoa Bay. Note the long dry persistent pedicels
3. ***Ruschianthus falcatus*** in cultivation
4. ***Saphesia flaccida*** in habitat near Malmesbury, SW Cape
5 & 6. ***Schwantesia acutipetala*** in habitat near Pofadder

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



SCHWANTESIA HERREI **L. Bolus** This species forms tight clumps of triangular leaves which are often suffused with red along the margins. The keels and margins are acute and have a sharp tip. The flowers are bright lemon-yellow.

Distribution: Occurs in S Namibia from Witputs into N Richtersveld and across to W Bushmanland, South Africa.

SCHWANTESIA RUEDEBUSCHII **Dinter** This species forms rounded compact clumps of longish, green to bluish-green leaves with the upper margins and apical-keel armed with broad flexible bluish red-tipped teeth. The showy flowers are lemon-yellow.

Distribution: Occurs from Warmbad in Namibia, W & E towards to Springbok and NW across the Orange River into S Namibia.

SCHWANTESIA SPECIOSA **L. Bolus** This clump-forming species often has the keel off-centre away from the apical point. The leaves are pale to whitish-green with dark margins. The flowers are golden- to orange-yellow.

Distribution: Occurs between Henkries, just S of the Orange River, to Jakhalswater, NE of Steinkopf.

STOMATIUM Schwantes

The plants of this genus form small to medium-sized clumps which tend to die out from the middle. The leaves are generally anisophyllous and their surfaces are usually heavily pimpled. The flowers open late afternoon or early evening and close towards midnight.

STOMATIUM ALBOROSEUM **L. Bolus** This is a small semi-globose to flattish species which produces numerous heads and which forms mats with age. The little leaf-pairs are rounded-truncate at the apices and densely covered with raised white papillae. Their colour is pale green becoming brownish with age and heat stress. The flowers are white to dark pink.

Distribution: Occurs in the SW Bushmanland, where it is common on calcareous flats and across to N of Steinkopf and S to Vanrhynsdorp.

STOMATIUM BOLUSIAE **Schwantes** This species forms large dense caespitose clumps. The leaves are light green to reddish-pink with heat stress. The leaf-pairs are almost globose and keeled, with soft teeth along the keels and margins. They are densely covered with small white raised papillae. The flowers are yellow.

Distribution: Occurs from the S Free State around Jagersfontein to S of Hanover in the Great Karoo.

STOMATIUM DIFFORME **L. Bolus** This species forms dense tufts of sub-globose leaves which become almost spathulate and which may or may not be keeled. The apices have several large, broad firm teeth, with teeth on the keel where present. Leaf-colour is green to green with reddish-brown tinge or reddish-brown probably due to heat stress. Flowers are bright yellow with a reddish tinge.

Distribution: Occurs near Laingsburg in the S Great Karoo.

STOMATIUM FULLERI **L. Bolus** This species forms compact clumps and later forms mats of many heads. The leaves are spathulate with the margins toothed. The inner and outer margins are dotted with the inner surface less rough than the outer. The leaves are grass-green to brown and the dots are whitish. Flowers are whitish-yellow.

Distribution: Occurs in the district of Kenhardt in the N Cape.

STOMATIUM MUSTELINUM **(Salm-Dyck) Schwantes** This species is a compact clump. It develops short thickish stems with age. The leaves are broadly obovate, spreading and somewhat recurved. The margins have several deltoid, stout teeth and the surface is pale greenish-grey and rough to the touch. They resemble the slaty habitat in which they grow. The pear-scented flowers are yellow with very narrow petals.

Distribution: Occur in the region around Calvinia.

STOMATIUM RYDERAE **L. Bolus** This species forms dense mats. The leaf-bodies are obovate, very slightly keeled, or not at all, and gape. The margins have small deltoid teeth. The leaves are pale green to purplish-green and are covered with white papillae. The flowers are sub-sessile and are yellow.



Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch

1 & 2. *Schwantesia herrei* in habitat in the Richtersveld
3. *Schwantesia speciosa* in habitat at Cookhouse, W of Somerset East, E Cape
4. *Schwantesia ruedebuschii* in cultivation
5 & 6. *Stomatium alboroseum* (left) (5) in association with *Ihlenfeldtia excavata* (right) in habitat N of Steinkopf. (6) in habitat near Steinkopf
7. *Stomatium bolusiae* in habitat near Colesberg, Great Karoo
8. *Stomatium difforme* in habitat near Laingsburg
9. *Stomatium fulleri* in habitat near Kenhardt
10. *Stomatium mustelinum* in habitat near Calvinia
11. *Stomatium ryderae* in habitat near Cradock



Bob Chinnock

Priscilla Burgoyne SANBI





Robin Frandsen



Priscilla Burgoyne SANBI

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Darrel Plowes



Distribution: Known only from the Cradock region in the E Cape.

STOMATIUM SUAVEOLENS **(Schwantes) Schwantes** This species forms compact, semi-globose clumps. The leaves are spathulate with a well-formed keeled chin. The margins have tiny ill-formed teeth which are barely visible in habitat but more prominent in cultivation. The green leaves are rough to the touch and give the effect of being crystalline because of the sub-epidermal calcium oxalate crystals. Flowers are yellow.

Distribution: Occurs in the Williston, Fraserburg Sutherland region.

STOMATIUM TRIFERUM **L. Bolus** This species forms dense mats and has somewhat stoutish teeth on the margins and keels. The surface is rough and is covered with minute whitish papillae. The colour is yellowish- to greyish-green suffused towards the apices with purple. Flowers are yellow.

Distribution: Occurs in the Fraserburg, Sutherland region.

STOMATIUM VILLETII **L. Bolus** This attractive small clump-forming species has ovate leaf-bodies, flattened on the surface of the leaves and rounded dorsally. The margins and keels have a few robust teeth. The epidermis is densely papillate with rounded white papillae. The flowers are bright yellow sometimes with red-tipped petals.

Distribution: Occurs in the Beaufort West region.

SYNAPTOPHYLLUM N.E. Br.

Synaptophyllum is a monotypic genus which is similar to *Mesembryanthmum*, occurring in patches in great numbers on the bare desert sands. Its attractive and unusual form prompts its inclusion in the book. Flowers open by day and close at night.

SYNAPTOPHYLLUM JUTTAE **(Dinter & A. Berger) N.E. Br.** This is a decumbent annual which branches 3—4 times from the base to form largish mats. The leaves are connate at the base and slightly tube-shaped, which aids in the collection of water from droplets from the mists in this largely rainless region. The leaves are green with some turning bright red or purple. The little flowers are white.

Distribution: Occurs in the fog belt, in a SW swath from around Lüderitz towards Rosh Pinah in S Namibia.

TANQUANA H.E.K. Hartmann & Liede

This very succulent genus is compact, with many branches, or is single-headed. The leaves may be anisophyllous or isophyllous. They are thick with rounded tips covered with translucent idioblasts. The plants were formerly included in *Pleiospilos* because of their dotted leaves. The highly-scented flowers open in the afternoon and close after night-fall.

TANQUANA ARCHERI **(L. Bolus) H.E.K. Hartmann & Liede** This species has triquetrous leaves up to about 2 cm long, which are occasionally slightly hooked at the apex. The back is obtuse and sometimes slightly keeled. The colour is lightish green and sometimes reddish in harsh sun, spotted with transparent dots. The flowers are yellow and whitish towards the centre.

Distribution: Occurs in the Laingsburg District.

TANQUANA HILMARII **(L. Bolus) H.E.K. Hartmann & Liede** This is the most unusual of the *Tanquana* species. It is the least known and the smallest. In nature the plants inhabit an area of extreme aridity and are well-sunken in the ground. In habitat they are brownish with greenish transparent dots and are so cryptic as to be most difficult to spot in habitat. Rarely do they produce more than one pair of leaves, although specimens in nature have been found with three heads. The leaf-body is isophyllous. The flowers are large and showy and are a bright golden-yellow. They are difficult to maintain in cultivation and it is well-nigh impossible to maintain the beautiful brownish leaf colour.

Distribution: In the extremely arid region in the Little Karoo between the Witteberg and Klein Swartberg, east of the Rooiberg Pass. An outlier population has been found to the west of Laingsberg.

TANQUANA PRISMATICA **(Marloth) H.E.K. Hartmann & Liede** This is a large, clump-forming species with up to 30 branches. The leaves are strongly anisophyllous with an obtuse keel and marked with darker dots. Their length is up to 4 cm long and the colour is green which does get reddish in strong sunny conditions. The flowers are yellow.



Bob Chinnock



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Robin Frandsen

Robin Frandsen





Bob Chinnock



Priscilla Burgoyne SANBI



Bob Chinnock

Judd Kirkel Welwitch





Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Robin Frandsen

Robin Frandsen



1. ***Stomatium suaveolens*** in cultivation
2. ***Stomatium triferum*** in habitat at Komsberg, SW of Sutherland
3. ***Stomatium villetii*** in habitat near Beaufort West
4 & 5. ***Synaptophyllum juttae*** in habitat in deep sand. In flower completely out of its usual flowering time, N of Lüderitz after extremely rare heavy rain.
6. ***Tanquana archeri*** in cultivation
7 - 9. ***Tanquana hilmarii*** (7 & 8) In habitat at Anysberg, NW Little Karoo. (9) In cultivation
10 - 13. ***Tanquana prismatica*** (10) in habitat N of Karoopoort, Ceres Karoo (11) in habitat NW of Matjiesfontein (12) In habitat at Beukesfontein, Ceres Karoo (13) in habitat at Perdefontein in association with *Didymaotus lapidiforme*, Ceres Karoo

Distribution: Confined to the southern Ceres Karoo where it is locally fairly abundant in suitable habitat, which is Dwyka tillite and Ecca shales.

TITANOPSIS Schwantes

This genus comprises plants which are the acme of mimicry. They are short-stemmed dwarf plants, forming small tufts or flat mats of definite rosettes. The leaf-apices are unmistakable with their prominent wart-like excrescences. Three species are recorded with the previously well-known *T. fulleri* which was subsumed into *T. calcarea* and *T. luederitzii* was included in *T. schwantesii.*

***TITANOPSIS CALCAREA* (Marloth) Schwantes** This is the best-known of the genus. The carunculate, warty leaf-apices are grey-white, resembling the limestone ridges and pebble beds, making it difficult to distinguish in the field. The upper parts of the warts are encrusted with crystals somewhat similar to the encrustations on the apices of the *Neohenricia sibbettii.* Flowers are showy and golden yellow, sometimes tinged with brown towards the tips of the petals.

Distribution: Occurs from W of Lückhoff in the S Free State across to Kimberley, and Griquatown and S to Prieska and E to Hopetown in the Great Karoo.

***TITANOPSIS HUGO-SCHLECHTERI* L. Bolus** This species is similar to the former but is easily distinguished by its flatter, somewhat triangular leaf apex. The tubercles are almost flat and well-defined, being lighter in colour than the background. The flowers are almost sessile and are yellow to straw-coloured to reddish, usually with darker tips.

Distribution: Occurs from Calvinia in the S to Warmbad in S Namibia in the N, across to Kenhardt in the E.

***TITANOPSIS SCHWANTESII* (Dinter) Schwantes** This species is closer in appearance to *T. calcarea* than to *hugo-schlecteri.* It differs in being a somewhat rounded caespitose tuft, well above ground as opposed to the flatter tufts of the other two. The apices of the leaves are similar in appearance to *calcarea*, with the leaves erect to sub-erect. Their colour is grey, to greenish-grey, with the tubercles light grey. Flowers are light-yellow. Occurs from The Karas Mountains to near Warmbad, S Namibia.

TRICHODIADEMA Schwantes

This genus could be classed as one of the weedy genera. There are, however, some interesting members, which can be quite attractive and unusual. The plants are characteristically defined by the star-like (diadem) cluster of trichomes at the apex of the leaves. In other respects they are mainly like other shrubby mesembs. Flowering is in winter to early summer, fully opening by mid-afternoon. Two interesting plants are shown here.

***TRICHODIADEMA BULBOSUM* (Haw.) Schwantes** This species has, in common with the more compact members of the genus, a thick rootstock, which also grows partially above ground. It has several erect basal branches up to about 20 cm high. The leaves are tightly-packed, green and spindle-shaped. The flowers are large and showy and are a deep reddish-purple in colour, usually lighter on the insides.

Distribution: Occurs on stony hills around Port Elizabeth.

***TRICHODIADEMA DENSUM* (Haw.) Schwantes** This species forms dense flattish to caespitose mats or tufts. It has thick, fleshy roots, not a tuber, and the branchlets are hidden by the dense mass of tightly-packed green leaves. The flowers are reddish-purple with white centres.

Distribution: Occurs from Willowmore to the W Little Karoo.

VANHEERDEA L. Bolus ex H.E.K. Hartmann

The members of this genus are similar to *Cheiridopsis* and *Ihlenfeldtia*. They are small compact branched plants which differ in that they produced up to three flowers to a branch, whereas the others invariably produce one flower to a branch.

***VANHEERDEA ROODIAE* (L. Bolus) L. Bolus** This species grows in clumps flat on the ground with erect, mostly keeled leaves which are oval to semi-globose. The margins and sometimes the keels are toothed. They are smooth but with very fine hairs. Their colour is green to purplish. Young leaves have distinct fine translucent dots. Flowers are yellowish-orange.

Distribution: Occurs in Bushmanland, NW of Loeriesfontein on dry gravelly soil.



Priscilla Burgoyne SANBI



Bob Chinnock

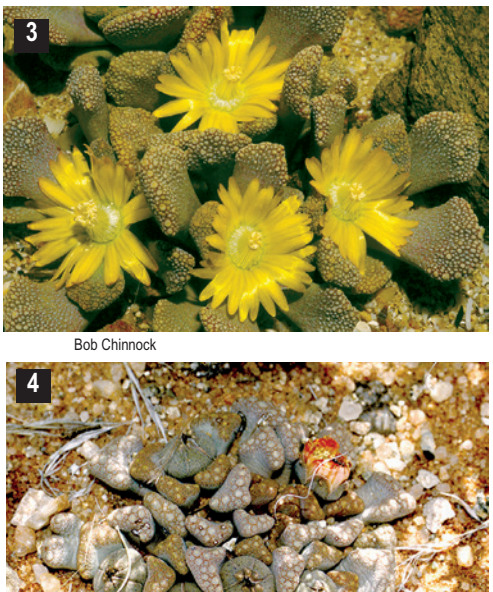


Priscilla Burgoyne SANBI

1 & 2. ***Titanopsis calcarea*** (1) in habitat near Hopetown, Great Karoo
(2) Showing the open capsules
3. ***Titanopsis fulleri*** in cultivation
4 & 5. ***Titanopsis hugo-schlechteri*** in habitat at Gamsberg, W of Pofadder
6 & 7. ***Titanopsis schwantesii*** (6) in habitat at Vaalputs, N of Grünau, S Namibia. (7) In cultivation
8. ***Trichodiadema bulbosum*** in habitat near Port Elizabeth
9 & 10. ***Trichodiadema densum*** (9) in habitat at Springfontein, S Little Karoo in association with *Euphorbia susannae.*
(10) In cultivation
11. ***Vanheerdea roodiae*** in habitat NW of Loeriesfontein



Robin Frandsen



Bob Chinnock

Robin Frandsen



Priscilla Burgoyne SANBI



Bob Chinnock

Robin Frandsen

Valentino Vallichelli

Darrel Plowes







CRASSULACEAE

The leaf- and stem-succulent Crassulaceae family occurs worldwide with the greatest concentration of taxa being found in southern Africa. Very many of the members are cultivated for their drought-resistance and attractive foliage. The flowers are generally uninteresting in appearance with the exception of flowers of plants of the genus *Cotyledon*. The extreme variability in many of its members, especially in the leaf morphology, makes explicit description sometimes difficult.

ADROMISCHUS Lem.

This genus comprises of succulent herbs or small bushes. The stems are small, sometimes with aerial roots. The leaves are decorative, mostly alternate, flat or roundish. The flower scapes are terminal. The flowers are short-stalked, or sessile. A few species have solitary flowers. About 30 species are recorded of which 10 are represented here.

ADROMISCHUS ALSTONII **(Schönland & Baker f.) C.A. Sm.** This is a small decumbent to erect plant up to about 16 cm tall. The leaves are decussate, oblanceolate, rounded above or slightly pointed with horny margins. pale-yellow to whitish and red-blotched. The flower-stalk is up to about 34 cm and the flowers are greenish, tinged with brown, with the lobes white to pale pink.

Distribution: Occurs somewhat inland from about Aus in Namibia to Garies in the N Cape.

Adromischus alstonii in habitat in the N Cape, *Photo Gerhard Beukes*



ADROMISCHUS CRISTATUS **(Haw.) Lem.** This small species, up to about 5 cm tall, is short-stemmed with stiff curly aerial rootlets which take up moisture from the dew. The oblanceolate leaves are wedge-shaped, somewhat concave on the upper surface, truncate at the apices with a wavy terminal margin. The colour is light green and the surfaces have dense white soft hairs. The scape is up to about 20 cm tall with whitish lobes and greenish-red corollae.

Distribution: Occurs in the Eastern Cape from Graaff-Reinet, southwards to Port Elizabeth and Grahamstown.

ADROMISCHUS FILICAULIS **(Eckl. & Zeyh.) C.A. Sm.** The stems of this small succulent are creeping or ascending. They rarely have aerial rootlets, but root from decumbent stems. The leaves are alternate, sub-ovate, slightly flattened or truncate and narrowing towards the base. They are pale green and with or without reddish spots. The scape is up to about 35 cm long with a yellowish-green tube and pinkish lobes. The subspecies *marlothii* differs very little from the nominate subspecies.

Distribution: Occurs from the Richtersveld in the N, along the mountain chains, to about Vredendal in the S. The subspecies *marlothii* occurs from about Worcester to Oudtshoorn in the W.

ADROMISCHUS MARIANIAE **(Marloth) A. Berger** This is possibly the best-known of the genus, with an interesting diversity of leaf forms. The great variation of the species has been shown to be continuous over its large range. This variation originally led to a number of subspecies being erected, but which should perhaps be abandoned. The basic form of the species could be described as low clump-forming succulents with crowded short to long leaves which are fairly narrow. The leaves may be smooth or verrucose, unmarked or heavily marked with red valleys between the verrucae. They tend to furl inward and in some variations there is a definite horny sharpish margin. The flower scape is up to about 35 cm tall, with the corollae green and the tips red.

Distribution: Occurs from just N of the Richtersveld N of the Orange River to about Clanwilliam in the S , as well as N & S Bushmanland.



Priscilla Burgoyne SANBI



Niels Jacobsen



Gerhard Beukes

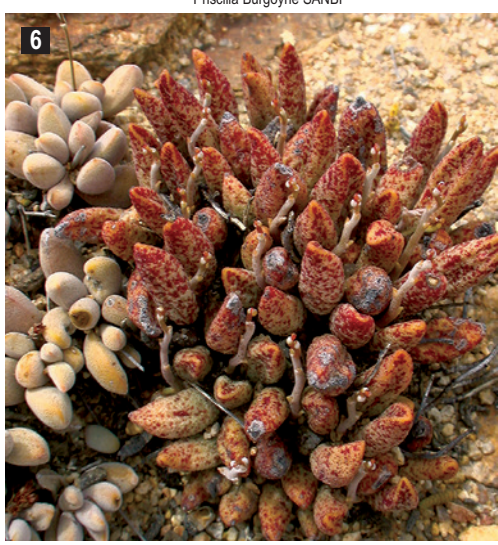
1 & 2. ***Adromischus cristatus*** in habitat N of Port Elizabeth
(2) In habitat at Coega, near Port Elizabeth
3. ***Adromischus filicaulis*** in habitat near Numees, Richtersveld
4. On the Spektakel Pass, SW of Springbok
5 & 6. ***Adromischus marianiae***
(5) in habitat near Kamieskroon.
(6) In habitat near Springbok



Priscilla Burgoyne SANBI

Priscilla Burgoyne SANBI





Adromischus montium-klinghardtii **(Dinter) A. Berger** This species forms clumps of erect leaves up to about 20 cm tall. The sessile leaves are small ovate to orbicular, with a blunt apical-point. The leaves are pale to darkish green and are generally unmarked or with red blotches. The flower scape is only up to about 10 cm tall with sessile, long tapering red to green corolla tubes and small yellow to white tips.

Distribution: This species is confined to the area from the Klinghardt Mountains in S Namibia to about Lekkersing in the Richtersveld in the S.

Adromischus subdistachys **Makin ex Bruyns** This unusual species could well be confused with a crassula when not in flower. It sometimes forms small mats. The stems are erect to decumbent, up to about 15 cm long. The leaves are orbicular to obovate, distichous when young and becoming spiraled, flattened and grey-green in colour, with a horny margin. The flower scape is up to about 15 cm tall and the flowers are greenish-yellow with longitudinal stripes.

Distribution: Occurs between Prince Albert and Pearston in the E Cape.



Adromischus subdistachys in habitat on the Pearstom Commonage
Photo Niels Jacobsen

Adromischus triflorus **(Thunb.) Berger** This species is little-branched and is up to about 10 cm tall, with decumbent stems with oblanceolate leaves. The leaves are pale yellowish-green often with red blotches, often confluent, mainly on the upper half, are similar in appearance to those of *A. trygnus*. The horny margins, which are usually restricted to the upper half. They produce usually up to three long flower scapes, sometimes branched with sub-sessile flowers which are pale pink with white tips.

Distribution: Common in the Little Karoo and across to Mossel Bay, extending westwards to the Robertson Karoo, across the western Great Karoo.

Adromischus trigynus **(Burch.) V. Poelln.** This is a very colourful large species, forming clumps of many stems, up to about 40 cm tall. The broad, oblanceolate leaves are grey-green, heavily blotched with red or green markings. The margins are horny and unmarked. The flower scape is up to about 25 cm tall and the flowers are a creamy-pink and red inside. The species *A. rupicola* has been transferred to this species.

Distribution: Widely spread from N of Pofadder in the W, to N of the Vaal River, S to Murraysburg and Colesberg. Favours shady places next to rocks.

Adromischus umbraticola **C.A. Sm.** This species has a tuberous base with short, erect many branches up to about 10 cm long, usually occurring flush with the ground. The leaves are grey-green, glaucous. often tinged with brown and occasionally with faint purplish spots; flat on the upper surface and rounded dorsiventrally, but sometimes rounded on the upper surface. The inflorescence is a spike-like thyrse which is pale-green, lightly tinged with pink and with a heavy waxy bloom.

Distribution: Occurs from Zeerust in the NW to Potchefstroom, across to Heidelberg, to N of Pretoria and across to Cullinan in the east.

Cotyledon Lem.

The name *Cotyledon* is an anagram of the word *Tylecodon,* which was coined by H.R. Toelken. Many *Cotyledon* species were transferred to *Tylecodon*, greatly reducing the original numbers of its species. The plants are branching succulent shrubs, with smooth, waxy leaves. The flowers are tubular and bell-shaped. Some 11 species are recorded with four being included here.



Gerhard Beukes



Judd Kirkel Welwitch



Judd Kirkel Welwitch

1. ***Adromischus montium-klinghardtii*** in habitat at Wallekraal, Richtersveld
2. ***Adromischus triflorus*** in habitat at Touws River, W Cape
3 & 4. ***Adromischus trigynus*** (3) in habitat S of the Gariep Dam, N. Cape (4 & inset) in cultivation, a plant from the N Cape
5 - 7. ***Adromischus umbraticola*** (5) in habitat on the Magaliesberg, W of Pretoria
(6) In habitat on Breedts Nek, Magaliesberg
(7) In habitat near Carltonville, W Gauteng

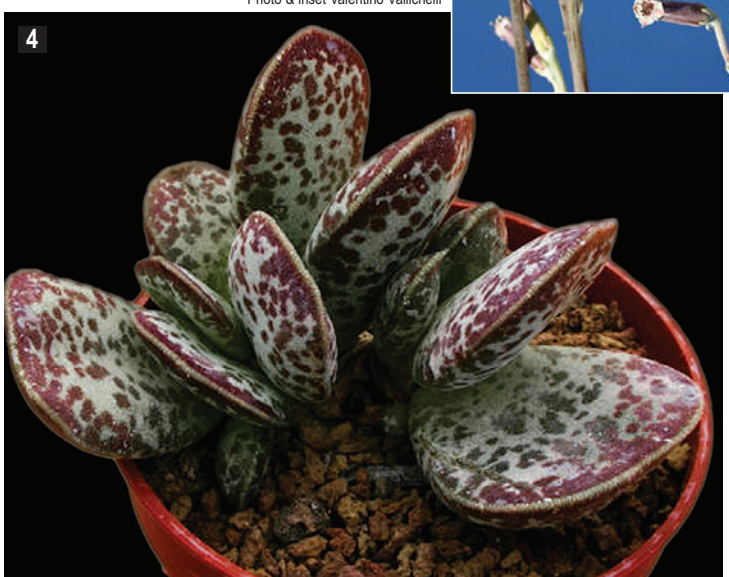


Photo & inset Valentino Vallichelli



Priscilla Burgoyne SANBI

Judd Kirkel Welwitch



Judd Kirkel Welwitch





Cotyledon adscendens **R.A. Dyer** This species is a small shrub or scrambler up to about 2 m tall. The leaves are opposite, obovate and rarely oblanceolate, somewhat concave above, glabrous and often with waxy flaking, pale-yellowish-green in colour with the margins and apices red. The flowers are produced singly or up to 3, with an orange-red almost cylindrical corolla tube. Could be confused with *C. woodii*, as it is very similar in appearance.

Distribution: Restricted to the coastal sand dunes E of Port Elizabeth, where it is fairly common.

Cotyledon barbeyi **Schweinf. ex Baker** This is a much-branched perennial growing up to about 2 m. The leaves are fleshy, varying from broadly ovate to lanceolate or sometimes linear. They are glabrous or sometimes covered with glandular hairs. The flowers are red with flared, recurved lobes. The base of the flower is bulged under the calyx. This separates the species from *C. orbiculata.*

Distribution: Widely distributed from N. KwaZulu-Natal through Swaziland, Mpumalanga, E Limpopo Province and widely throughout Zimbabwe.

Cotyledon campanulata **Marloth** This is a spreading clump-forming species up to about 60 cm tall, with yellowish-green hairy leaves, often marked with reddish at the tips. These are opposite linear-lanceolate. The inflorescence is up to about 35 cm long with an umbel of pendant yellow flowers.

Distribution: This species favours karooid shrub and occurs commonly in the E Cape from Graaff-Reinet, S to Willowmore and across to Grahamstown.

Cotyledon orbiculata **L**. This is a very variable perennial shrub, up to about 1.3 m tall. Its varieties are distinguished mainly on the basis of geographical distribution, the leaf shapes and arrangements of the corolla shapes. Five varieties are recognised: *orbiculata, flanaganii, spuria, oblonga* & *dactylopsis*. Except for var. *flanaganii*, the leaves are opposite. They are glabrous to hairy, bright green to velvety with a grey bloom. Some have a red cartilaginous margin and some with an undulate margin. Flowers are in cymes of up to about 10 flowers on a stout peduncle, colours are pink to red, sometimes yellow. *C. papillaris* which is an attractive, very dwarf species has been included in *C. orbiculata.* Given the extensive range of marked differences perhaps the whole complex is in great need of serious revision.

Distribution: Widespread in the W, E & N Cape and Namibia. The variety *flanaganii* restricted to the hills around the lower Kei River, E. Cape; var. *dactylopsis* from Kimberley, to Bloemfontein and S to Hopetown, Smithfield; var. *spuria* is restricted to the SW Cape; var. *oblonga* is widespread, but fairly rare. It occurs in Gauteng, Limpopo Province, Mpumalanga, E. Free State, KwaZulu-Natal, E Cape, E Swaziland, Lesotho and Mozambique.

Cotyledon woodii **Schönland & Baker f.** This is a much-branched species which grows up to about 1.3 m tall. the leaves are oblanceolate to ovate, waxy and dark green often with reddish margins. The inflorescence has 1—few bell-shaped pendant red flowers, usually greenish towards the base.

Distribution: Occurs from Graaff-Reinet in the central Great Karoo, S towards Ladismith in the Little Karoo and across to the E Cape.

Cotyledon campanulata in habitat near Pearston, E Cape
Photo Niels Jacobsen



Cotyledon woodii in habitat at Mansfield Farm, Near Bathurst, E Cape
Photo Niels Jacobsen





Photo & inset Niels Jacobsen



Darrel Plowes



Judd Kirkel Welwitch



Gerhard Beukes



Robin Frandsen



Robin Frandsen



Gerhard Beukes

1. ***Cotyledon adscendens*** in habitat NE of Port Elizabeth
2 & 3. ***Cotyledon barbeyi*** (2) in habitat at Blouberg, Limpopo Province. Inset: flowers (3) In habitat in the Manyika Communal Area, Mutare, Zimbabwe
4 - 11. ***Cotyledon orbiculata*** (4) in habitat on Breedts Nek, Magaliesberg
(5) In habitat at Haalenberg, near Lüderitz, Namibia
(6) In habitat on Helshoogte, Richtersveld National Park
(7) In cultivation in the N Drakensberg, KZN-Natal
(8) In habitat N of Eksteenfontein, Richtersveld
(9) In habitat in Helskloof, Richtersveld National Park.
(10) In habitat near Grootderm, E of Alexander Bay
(11) In habitat on Helshoogte, Richtersveld. Previously *C. papillaris*



Niels Jacobsen

Robin Frandsen



Niels Jacobsen



Gerhard Beukes



Crassula L.

This ubiquitous genus has a very wide distribution, from South Africa to Yemen, as well as a very diversified range of form and size, from the tiny *C. natans*, found floating on water or dessicating in dried-up water hollows, to large specimens, such as *C. arborescens*, which attains the height of in excess of 1.5 m. The genus comprises mainly perennial succulents. Leaves are opposite and often in rosettes. The flowers are fairly small, white, pink and occasionally yellow.

There are in excess of 250 species in this area, very many of which are somewhat weedy and uninteresting.

***Crassula acinaciformis* Schinz** This species is a perennial or a biennial which grows up to about 1.4 m tall in flower. It usually has one rosette. The leaves are erect and spirally arranged and the canaliculate, glabrous, green to yellowish leaves are triangular to lanceolate with narrow, pointed marginal teeth. The inflorescence is a flat-topped thyrse with many flowers. The flowers are a pale yellow.

Distribution: This species occurs in the SE Mpumalanga, around Barberton, into Swaziland and N central Kwa-Zulu-Natal.

***Crassula alba* Forssk.** This is an attractive species with a very wide distribution. There are three varieties: *alba, parvisepala* and *pallida*. The differences are so slight as to be unimportant to this work. The plants are up to 0.5 m tall, usually with red to green stems and several branches and rebranches. The green to yellowish-green leaves are lanceolate to linear-triangular with marginal cilia. The flowers in our region are almost always deep red, the name *alba*, referring to the white colour of the flowers, originating from the original description of the plant from Yemen on the Arabian Peninsula. The flowers of var. *pallida* are recorded as being whitish to yellowish.

Distribution: The variety *alba* occurs from the N parts of the E Cape, through Lesotho, KwaZulu-Natal, the E Free State, Gauteng, Mpumalanga, Swaziland, northwards through Zimbabwe and as far N as N Yemen on the Arabian Peninsula. The variety *parvisepala* Occurs in Mpumalanga, N. Swaziland and var. *pallida* occurs NE of Mbabane in Swaziland, near Barberton and Pilgrims Rest in Mpumalanga.

***Crassula alpestris* Thunb.** This species is similar to *C. pyramidalis* This is a small, erect species with many off-shoots. The green to reddish triangular leaves clasp the stem, are fleshy and the margins are ciliate with white cilia. They become shorter towards the apex. The white, sometimes cream, flowers are borne at the apex in a tight umbel.

Distribution: Occurs from Nieuwoudtville to E of Worcester.

***Crassula alstonii* Marloth** This is a dwarf, short-stemmed species which forms almost spherical rosettes of closely adpressed leaves. They are usually solitary and do not always produce a few rosettes. The old leaves are not deciduous. Leaves are covered with stiff reflexed hairs mainly on the exposed portions. Their colour is grey-green to very pale pink. The inflorescence is solitary and branched with a cyme of pinkish to white flowers.

Distribution: From the Richtersveld National Park to Kommagas, W of Springbok.

***Crassula aphylla* Schönland & Baker f.** This strange plant is somewhat reminiscent of *C. natans* in its water-filled pans habitat, The plant has one large club-shaped branch from which radiate a multitude of side branches, up to about 30 mm high, with tiny brown leaves which appear to be absent, but are in fact fused into a tiny fleshy ring around the upper part of each internode. The very small terminal flowers, up to four per branch, are on a short stalk and are fused into a ring of about 0.5 mm in diameter, with the lobes white, often tinged with red and recurved. An inhabitant of shallow water-filled pans.

Distribution: Occurs from the Vanrhyns Pass, southwards to the Hex River Mountains in the W Cape.

***Crassula arborescens* (Mill.) Willd.** This is a large shrub up to about 1.5—2 m tall. It is many branched and the old leaves are deciduous. Leaves are obovate to almost orbicular, fleshy, grey-green often with a reddish tinge and covered with a grey bloom. The leaves of subsp. *undulatifolia* are elliptic to oblanceolate, with wavy edges and red margins. The inflorescence is a round-topped thyrse. The colour is white or cream or lightly tinged with pink.



Niels Jacobsen



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

Priscilla Burgoyne



Judd Kirkel Welwitch

Priscilla Burgoyne

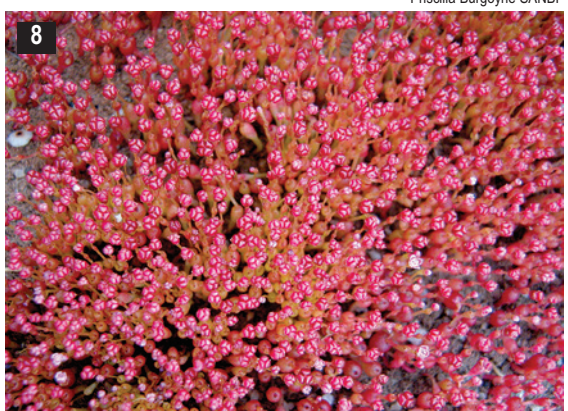


Priscilla Burgoyne SANBI

1.***Crassula acinacifolia*** in habitat near Barberton, Mpumalanga
2. ***Crassula alba*** in habitat near Dullstroom
3. ***C. alba*** **subsp.** ***parvisepala*** in habitat near Dullstroom
4. ***Crassula alpestris*** in habitat in the SW Cape
5 & 6. ***Crassula alstonii*** in habitat at Wolfberg, Richtersveld
7 & 8. ***Crassula aphylla*** in habitat on the Gifberg, SW of Vanrhynsdorp
9. ***Crassula arborescens*** in habitat near Ladismith, SW Cape
10 & 11. ***C. arborescens*** **subsp.** ***undulatifolia*** in habitat in the Great Winterhoek Mountains, E Cape







Priscilla Burgoyne SANBI

Distribution: Occurs from the Hex River Valley across to Prince Albert, with subsp. *undulatifolia* found only on the southern lower rocky slopes of the Groot Winterhoek Mountains of the Eastern Cape.

Crassula atropurpurea **(Haw.) D. Dietr.** This is a small, usually glabrous, succulent growing up to about 60 cm tall, with erect to decumbent branches. It rarely has only a basal rosette. It has woody branches with the old leaves deciduous. The leaves are oblanceolate, with obtuse margins, green becoming deep red. The inflorescence is on a long pedicel with a capitate head of red flowers.

Distribution: Widespread from SW Namibia to the E Cape.

Crassula barbata **Thunb.** This charming little annual or biennial species forms offshoots of several heads of flat rosettes. The obovate leaves are green with reddish margins to red. They are soft, almost long as they are wide, with very conspicuous silky hairs along the margins. The inflorescence is a thick, red thyrse with the sessile flowers red and tubular in a dense cylindrical arrangement.

Distribution: From W of Touws River to Prince Albert and disparately near Victoria West and in the Little Karoo, from Oudtshoorn southwards to the Outeniqua Mountains.

Crassula barklyi **N.E. Br.** This species is better-known by the incorrect name *C. teres*. It is superficially similar to *C. columnaris*. This perennial forms small compact columns of up to about 8 cm tall and branches freely, forming mats. The smoothly overlapping leaves, with their densely ciliate margins, cover the stem, with the old leaves being somewhat persistent. This species does not die after flowering. Flowers are in terminal cymes which are partially hidden by the leaves below. The flowers are cream.

Distribution: On stony slopes and low hillsides from W of Vanrhynsdorp to Port Nolloth.

Crassula biplanata **Haw.** This is a perennial much-branched variable species. It is erect to decumbent with the branches either woody or fleshy and usually covered with papillae at the internodes. It grows up to about 2.5 m tall. The dark-green leaves are lanceolate to terete and are covered with a thick bloom. The inflorescence is usually a domed- to flat-topped thyrse with few to many densely-clustered white to yellow tubular flowers.

Distribution: Occurs from near Worcester in the W Cape to near Humansdorp in the E Cape on rocky slopes rarely in rocky crevices.

Crassula brevifolia **Harv.** This is a shrublet which is much-branched, growing up to about 0.5 m tall. The stems are flaky and the old leaves are deciduous. Leaves are opposite and amplexicaul. They are fleshy and almost triangular, with a bloom. They are green, changing to yellow, or purplish-red and yellowish towards the base. The flowers are on a short peduncle, often partly hidden by the leaves. The flowers are lemon-yellow.

Distribution: Occurs from SW Namibia southwards towards Vanrhynsdorp.

Crassula capitella **Thunb.** This is a very variable perennial, rarely biennial species with three subspecies: *capitella, thyrsiflora* and *nodulosa*. The plants are decumbent to erect and are up to about 40 cm tall when in flower. They are green to red in colour. The inflorescence is a thyrse with sessile yellow flowers. The subspecies *capitella* has one basal rosette and linear to lanceolate, rarely obovate leaves with the inflor-escence rarely branching at the base. The subspecies *nodulosa* has one or rarely few rosettes, erect stems, obovate leaves - rarely elliptic or lanceolate, often covered with short hairs. The inflorescence is simple. The subspecies *thyrsiflora* usually produces a few rosettes with spreading recurved triangular leaves.

Distribution: Widespread throughout South Africa. The subspecies *capitella*: S Free State, S to Port Elizabeth, NE into the former Transkei and W to Ladismith in the Little Karoo. The subspecies *nodulosa* S of Soutpansberg to W Mpumalanga, across to W of Kimberley and N. Free State. The subspecies *thyrsiflora* occurs across the S Cape, N to near Kimberley disjunctly into central KwaZulu-Natal, parts of Namaqualand and S Namibia.

Crassula coccinea **L.** This is a beautiful shrublet, growing up to about 60 cm tall. It is also known erroneously



Gerhard Beukes



Niels Jacobsen



Judd Kirkel Welwitch





Robin Frandsen



Judd Kirkel Welwitch



Judd Kirkel Welwitch

Niels Jacobsen



1. ***Crassula atropurpurea*** in habitat near Port Nolloth
2 & 3. ***Crassula barbata*** (2) in habitat at Perdefontein, S Ceres Karoo (3) In habitat in the Little Karoo
4. ***Crassula barklyi*** in habita near Doring Bay, W Coast
5. ***Crassula biplanata*** in habitat at Gatboskloof, E of Swellendam
6, **7 & 8**. ***Crassula brevifolia*** (6) inflorescence in habitat in the Richtersveld (7& 8) In habitat near Concordia, NE of Springbok
9. ***Crassula capitella*** **subsp *thyrsifolia*** in habitat in the S Cape
10. ***C. capitella*** **subsp. *nodulosa*** in habitat near Haenertsburg, Limpopo Province
11 & 12. ***Crassula coccinea*** in habitat at Silvermine, Cape Town





6, 7 & 8 Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



as *Rochea coccinea*. The plants branch freely with reddish stems and the leaves are only slightly fleshy. They are decussate, lanceolate and slightly incurved. The flowers form beautiful cymes with the flowers being red to scarlet. White and red-white forms exist.

Distribution: Favours the mountains and deep valleys of the SW Cape from the Cape Peninsula to Bredasdorp.

CRASSULA COLUMNARIS **Thunb.** This dwarf species is similar to *C. barkleyi*, it is a perennial or biennial, usually simple and rarely branching (subsp. *columnaris*) or often much-branched with small axillary branches at the base (subsp. *prolifera*). Up to 10 mm high. The leaves are decussate, cup-shaped, with rounded apices sometimes with a dorsal ridge, especially on young plants. They completely envelop the stem. The plant takes years of development before flowering. With subsp. *prolifera* there is a definite division between the northern and southern populations with a line between Soebatsfontein and Hondeklip Bay. The leaves of the northern plants have a definite dorsal ridge and the inflorescence is usually half hidden in the top leaves, whereas the southern plants have a scarcely discernable dorsal ridge and the flowers are well above the top leaves. The subspecies *columnaris* has its inflorescence half hidden in the top leaves. The flowers are an umbel of yellow to cream to red flowers.

Distribution: Occurs from Calvinia, S to about Touws River and E to Oudtshoorn. The subspecies *prolifera* occurs in the NW Cape from about Vanrhyns-dorp into the extreme WSW of Namibia and across to Pofadder in Bushmanland.

CRASSULA CONGESTA **N.E. Br.** This species is much like *C. columnaris.* It differs however in its leaf-formation. The plant is taller - up to about 20 cm long. The plant is erect with the decussate green to reddish leaves connivent at the base. The leaves vary from being sharply lanceolate (subsp. *laticephala*), to curving upwards and blunt and the flowers white or cream (subsp. *congesta*). The flowers are in an umbel, becoming red when ageing.

Distribution: Subs. congesta occurs between Touws River to E of Laingsburg on the N rocky slopes of the Witteberg and subsp. *laticephala* occurs between Barrydale and Oudtshoorn on gently sloping rocky ground.

CRASSULA CORALLINA **Thunb.** Two subspecies, *corallina* and *macrorrhiza,* comprise this species. The plants are decumbent, many-branched, rooting in succession at a number of nodes. The tiny leaves are obovate to nearly elliptical, sometimes covered with a layer of wax, with the leaf-heads barely 5 mm in diameter. The subspecies *macrorrhiza* varies from the nominate subsp. *corallina* in having tuberous roots and not usually forming adventitious roots, as well as having rounded apices with a heavier wax coating.

Distribution: The subspecies *corallina* occurs from Gauteng, through the W Free State, the E Cape to about Laingsburg, NW to the Richtersveld and near Aus in S Namibia. The subspecies *macrorrhiza* is confined to S Namibia from about Grünau to Karasburg and in the Richtersveld from about Steinkopf northwards.

CRASSULA CORDATA **Thunb.** This is a perennial species with erect to decumbent growth, up to about 0.3 m tall. The old leaves are not deciduous. The leaves are broadly ovate, grey-green to pinkish with reddish margins and some red spots. The inflorescence is about 1.5 cm long. The flowers are star-shaped, cream to pale yellow. The growth is robust and erect W of the Fish River becoming more decumbent in the E.

Distribution: Sparsely distributed in S KwaZulu-Natal, common in the E Cape

CRASSULA COTYLEDONIS **Thunb.** This is a very variable perennial species, up to about 8 cm high, with basal rosettes which persist until they decay. The leaves are broadly

Crassula cotyledonis Left: in habitat near Concordia *Photo Priscilla Burgoyne SANBI.* Right: in habitat on Helshoogte, Richtersveld National Park, with *Avonia baeseckei Photo Robin Frandsen*







Robin Frandsen



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Robin Frandsen



Darrel Plowes

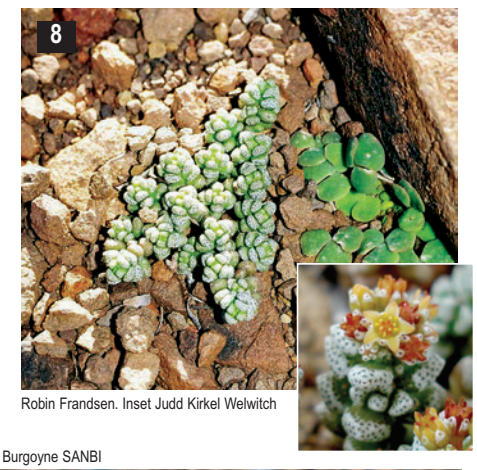
1 - 2. ***Crassula columnaris*** in habitat, at Matjiesfontein
3 - 5. ***C. columnaris* subsp. *prolifera*** (3) in habitat
(4) In habitat near Steinkopf
(5) In habitat close-up of the flowers, near Doring Bay, West Coast
6. ***Crassula congesta*** in habitat at Klaarstroom, N of Meiringspoort
7. ***C. congesta* subsp. *laticephala*** in habitat W of Oudtshoorn
8. ***Crassula corallina* subsp *corallina*** in habitat E of Upington
9 & 10. ***C. corallina* subsp. *macrorrhiza*** (8) in habitat in the Richtersveld
(9) in habitat near Springbok
11. Transvaal form of subsp. *corallina*, in habitat in Gauteng
12. ***Crassula cordata*** in habitat in the Great Winterhoek Mountains, E Cape



Gerhard Beukes



Judd Kirkel Welwitch



Robin Frandsen. Inset Judd Kirkel Welwitch



Priscilla Burgoyne

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch



lanceolate to obovate, narrower in the Karoo and flattened. They are densely pubescent with coarse recurved hairs and ciliate margins. The inflorescence is a long thyrse, up to about 30 cm with clusters of small cream flowers.

Distribution: Occurs from S of Alexander Bay, the W Cape as far as the E Cape.

Crassula deceptor **Lem.** This perennial is a small usually much-branched species, up to 8 cm high, with the triquetrous leaves 4-ranked, closely adpressed and covering ther stems. The keels of the grey, tinged with brown, leaves are covered with grey, green or brown almost spherical papillae. The inflorescence is a loose, thyrse up to about 80 mm long. The flowers are cream, fading to brown. The rather distinctive *C. cornuta* has been included under this species.

Distribution: From about Vanrhynsdorp to S Namibia and across to about Pofadder in Bushmanland.

Crassula deceptor Below: in habitat N of Steinkopf. *Photo Robin Frandsen*
Bottom: previously known as *C. cornuta*. In habitat in the Richtersveld
Photo Darrel Plowes





Crassula dejecta **Jacq.** This perennial shrublet grows up to about 6 cm tall. It is often densely branched with old leaves not deciduous, branch-internodes have harsh hairs. The leaves are lanceolate, oblong to elliptic, rarely ovate, flattened to incurved, with rounded marginal papillae. The inflorescence is a round-topped to flat thyrse. The flowers are white, often tinged with red or pink.

Distribution: Occurs from near Springbok in the N to about Stellenbosch in the S favouring the mountainous areas.

Crassula deltoidea **Thunb.** This is a distinctive species, up to about 8 cm tall, which forms dense clumps of fleshy, triquetrous, mealy-coated leaves which are green to green with a reddish suffusion, The inflorescence is a rounded thyrse, up to barely 10 mm. The flowers are cream, rarely white.

Distribution: Occurs from SE Namibia, southwards through Bushmanland and the Tanqua Karoo to near Prince Albert.

Crassula dependens **Thunb.** This is a perennial, decumbent species with thin stems which forms dense bushes approximately 20 cm tall. The leaves are linear-lanceolate and the old leaves are not deciduous. They are glabrous and their colour is green to brown, rarely red. They are dorsally compressed and slightly curved with a sharp tip. The inflorescence is nearly flat topped with a few to many white or cream flowers.

Distribution: Widely spread in the E South Africa with a disjunct population in the Auas Mountain in Namibia.

Crassula dichotoma **L.** This interesting little annual crassula forms small, many branched shrublets with erect wiry stems about 25 cm tall. The leaves are lanceolate, obovate, to elliptical. Flowers are produced on a many-branched flower head. These are simple and their colour is yellow, sometimes with a red base to the lobes or rarely orange, but very variable.

Distribution: From near Springbok to the Cape Peninsula.

Crassula elegans **Schönland & Baker.** This very small perennial species is much-branched and it grows hardly taller than 80 mm. The leaves are ovate, broadly triangular

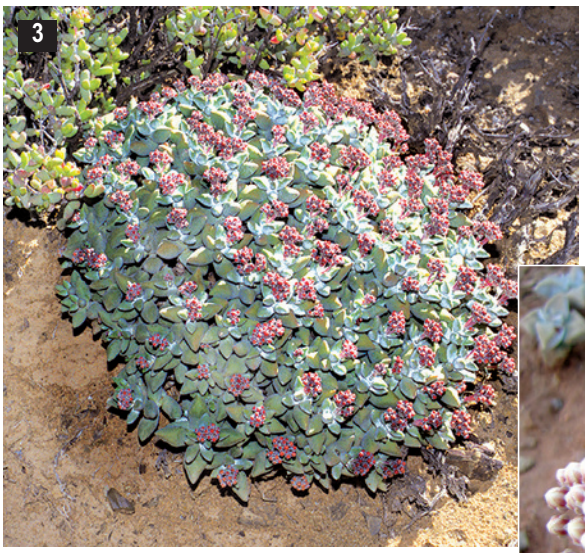


Priscilla Burgoyne SANBI. Inset Niels Jacobsen



Priscilla Burgoyne SANBI

1. ***Crassula dejects*** in habitat in the du Toits Kloof, SW Cape
2. ***Crassula dependens*** in habitat at Carltonville, W Gauteng
3 & 4. ***Crassula deltoidea*** in habitat at Koup, E of Laingsburg
Inset: in habitat at Carnarvon
5. ***Crassula dichotoma*** in habitat near Kamieskroon, N Cape
6 & 7. ***Crassula elegans*** (6) in habitat on the Buchuberg, near Alexander Bay
(7) In habitat in the Richtersveld



3 & 4 Robin Frandsen. Inset Priscilla Burgoyne SANBI





Niels Jacobsen

Judd Kirkel Welwitch





Judd Kirkel Welwitch



and rarely lanceolate, they are crowded on the short stems. Their colour is green or brownish-red or deep red, sometimes glabrous or with fine hairs. The subsp. *namibensis* has coarse papillae on the leaves. The inflorescence is loose, round-topped thyrse with creamy-yellow flowers.

Distribution: Occurring in sandy soil it prefers some shade. The subspecies *elegans* is widespread from N of Vanrhynsdorp to SW Namibia. The subspecies *namibensis* occurs in a small area from Lüderitz, southwards.

CRASSULA ERICOIDES **Haw.** This perennial species is freely branching to form small shrubs, up to about 0.5 m tall. The tightly-packed, small leaves are lanceolate to ovate and tightly cover the branches. The inflorescence is a sessile thyrse with several dichasia, often completely hidden by the leaves. The shortly pedicellate flowers are white to cream.

Distribution: Widely, but patchily distributed along the KwaZulu-Natal coast, southwards and westwards to as far as Swellendam. Greatest concentration is in the E and S Cape.

CRASSULA EXILIS **Harv.** This species forms dense cushions of rosettes. It is barely 10 cm tall in flower. The spirally-arranged green to dark-green leaves are broadly triangular in cross-section, slightly grooved above and broadly convex below. The peduncle is hairy and the inflorescence is a more or less rounded thyrse, with large white flowers which are often tinged with red. There are several recorded subspecies which are not featured here.

Distribution: The subspecies *exilis* occurs in a few localities S & SW of Steinkopf in Namaqualand.

CRASSULA EXPANSA **Dryand.** This is a perennial, rarely annual, species with decumbent, or rarely scrambling branches. Four subspecies are recorded: *expansa, filicaulis, pyrifolia* and *fragilis*, of which two are illustrated here. The leaves are usually sessile and clasp the stems, they are lanceolate to elliptic to clavate, green to maroon and speckled with hydathodes. Flowers are solitary and are produced in the axils of the uppermost leaves. The subspecies *filicaulis* and *pyrifolia*, both illustrated here, are decumbent with long stilt roots (subsp. *expansa* and *fragilis* lack these). The glabrous leaves are sessile and lanceolate. The white to reddish-tipped flowers are campanulate with spreading acute petals.

Distribution: The subspecies *filicaulis* occurs from the Cape Peninsula to near Port Alfred on coastal dunes. The subspecies *pyrifolia* occurs in a very limited area in S Namaqualand, near Kommagas growing in sandy depressions.

CRASSULA GARIBINA **Marloth & Schönland** This is a dwarf species which is usually decumbent, rarely forming a small shrublet. The branches and leaves are brittle. Leaves are linear-lanceolate with an abruptly constricted apex. The linear-lanceolate leaves are grey-green to brownish, are densely pubescent with clavate hairs. The inflorescence is up to 40 mm long, with a rounded thyrse with several dichasia. Flowers are off-white to cream.

Distribution: Occurs mainly on both sides of the Orange River from the coast to about Goodhouse in the E.

CRASSULA GRISEA **Schönland** This is an erect perennial, up to about 0.2 cm tall. Old leaves are persistent and scarcely shrivelling. Leaves are linear-lanceolate, more or less triangular in cross-section; glabrous, or hairy or covered with papillae. Pale-green with reddish margins, brownish or reddish. The inflorescence is a round-topped thyrse, covered with recurved hairs. Flowers are cream, fading to brown.

Distribution: Occurs from N of the Orange River in Namibia to S of Kommagas in the N Cape.

CRASSULA HEMISPHAERICA **Thunb.** This dwarf perennial usually produces only one hemispherical rosette. It grows to about 12—15 cm tall. The leaves are produced spirally and are recurved and adpressed. They are usually obtuse and are glabrous except for the short white marginal cilia. Their colour is green-grey to brownish-green. The inflorescence is a spike-like thyrse with numerous white to cream flowers.

Distribution: Widely distributed from the Knersvlakte E to and across the SW Great Karoo, to the Little Karoo and across to Willowmore.



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

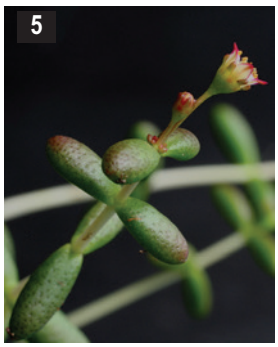


Priscilla Burgoyne SANBI

1 & 2. ***Crassula ericoides*** in habitat,at Potberg, SW Cape and (2) close-up of branches
3. ***Crassula exilis*** in habit at Kaip Road, NE of Springbok
4. ***Crassula expansa*** **subsp.** ***filicaulis*** in habitat in the E Cape.
5. ***C. expansa*** **subsp.** ***pyrifolia*** in habitat at Geelwal, near Lutzville, N Cape
6. ***Crassula grisea*** in habitat in the Richtersveld
7. ***Crassula garibina*** in habitat near Aggeneys, Bushmanland
8 & 9. ***Crassula hemisphaerica*** in habitat



Niels Jacobsen



Niels Jacobsen



Judd Kirkel Welwitch

Judd Kirkel Welwitch



Judd Kirkel Welwitch



Niels Jacobsen



***Crassula hirtipes* Harv.** This is a perennial shrublet with brittle, decumbent stems up to about 15 cm long. The leaves are in tight clusters which are not deciduous. The leaves are blunt, almost terete to clavate and are densely covered with hard recurved bristle-like hairs, as are the stems and peduncle. Their colour is red, pinky-yellow to yellow to green. The inflorescence is a hairy thyrse with clusters of cream to yellow flowers.

Distribution: Occurs on the mountainous slopes, inland from Port Nolloth to Vanrhynsdorp.

***Crassula lactea* Schönland.** This is a perennial decumbent, rarely scrambling, shrub with branches up to about 40 cm long. The leaves are sessile, oblanceolate, dull green often with a horny margin. There is a row of hydathodes along the leaf-margins. The inflorescence is a thyrse with many dichasia, up to about 10 cm long. The flowers are white to off-white, sometimes tinged with red.

Distribution: Occurs along the coast and inland from Mossel Bay to East London.

***Crassula lanuginosa* Harv.** This is a perennial with short decumbent or prostrate branches up to about 15 cm long. The leaves are crowded, hiding the internodes and are lanceolate, acute or terete. They are covered by long soft recurved hairs. The colour is green to grey-green to red. The inflorescence is more or less a flat-topped thyrse. The flower colour is white to cream.

Distribution: Occurs between Aliwal North and Cradock in the E Cape.

***Crassula macowaniana* Schönland** This is a variable perennial much-branched species which forms low shrubs of prostrate branches up to about 1.2 m. The leaves are lanceolate to linear, somewhat curved upwards. They are somewhat flattened above and very obtuse below and pointed at the tips. Their colour is green to green suffused with red to yellow-red. The inflorescence is a rounded thyrse with a somewhat capitate umbel of white flowers which are often tinged with red.

Distribution: Occurs from SW Namibia, S to Clanwilliam.

***Crassula mesembryanthemopsis* Dinter** This diminutive species has one or few dense, spirally arranged rosettes, which grow almost level with the ground, with only the retused leaf-tips showing. The leaves are are green to whitish and are covered with hard round papillae. The virtually sessile inflorescence arises directly out of the centre of the rosette and has a cyme of many white flowers.

Distribution : The distribution is widely disjunct, from E of Cape Cross in Namibia; Witputs in S Namibia; the NW Cape from the Orange River to near Kommagas and across to near Pofadder in Bushmanland.

***Crassula mesembryanthoides* (Haw.) D. Dietr.** This is a perennial shrublet up to about 40 cm tall. It is much-branched with spreading branches and with the old leaves deciduous. Two subspecies are recorded: *mesembryanthoides* and *hispida*. In the nominate subspecies the leaves are linear-triangular, recurved, concave on the top and very obtuse below. In *hispida* the leaves are linear-elliptic, sharply acute and somewhat flat on top. The hairs are finer and recurved as opposed to the nominate subspecies, which has harder and shorter hairs. The inflorescence is a globular to flat thyrse and the flowers are white to cream.

Distribution: The subspecies *mesembryanthoides* occurs from Graaff-Reinet to Port Elizabeth. The subspecies *hispida* occurs between Grahamstown and Kingwilliamstown.

***Crassula multicava* Lem.** This is a perennial species with a soft decumbent growth, up to about 0.4 m. The plant forms extensive stands. The ovate somewhat crenulate leaves have hydathodes scattered on both surfaces and concentrated on the margins. They are green and clasp the

Crassula multicava in habitat on disturbed ground, along a road embankment, at Gatbos, E of Swellendam, SW Cape *Photo Niels Jacobsen*





Priscilla Burgoyne SANBI



Judd Kirkel Welwitch



Gerhard Beukes



Priscilla Burgoyne SANBI

1 & 2. *Crassula hirtipes* in habitat near Kamieskroon
3 & 4. ***Crassula lactea*** (3) in habitat in the Groot Winterhoek mountains, E Cape (4) In habitat near Uitenhage, E Cape
5. ***Crassual lanuginosa*** in habitat at Sada, NW of Cathcart, E Cape
6 - 8. ***Crassula macowaniana*** (6) In habitat N of Springbok (7) Inflorescence: in habitat an Numees, Richtersveld. (8) In habitat near Lekkersing, Richtersveld
9 - 11. ***Crassula mesembryanthemopsis*** (9) in cultivation (10) inhabitat at Gamsberg, W of Pofadder. (11) In cultivation
12. ***Crassula mesembryanthemoides*** in habitat near Committees, NW of Grahamstown
13. ***C. mesembryanthemoides*** **subsp. *hispida*** in habitat near Grahamstown



Gerhard Beukes



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Robin Frandsen



Judd Kirkel Welwitch

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



stems. The longish inflorescence has an umbel of pinkish-white flowers and the plant reproduces from adventitious buds which form at the axils of the bracts.

Distribution: Occurs from the extreme S of KwaZulu-Natal into the E Cape to near Port Elizabeth.

CRASSULA MUSCOSA **L.** Formerly well-known as *C. lycopodioides* it has four subspecies. Only the nominate subspecies is represented here. The others are unmistakably *C. muscosa* and very similar to subsp. *muscosa.* It is a sub-erect to erect and occasionally scrambling, many-branched species with the branches densely covered with small, scaly, triangular brown to greyish-green leaves. The flowers are a thyrse, with many sessile, pale yellowish to brown flowers.

Distribution: This is a widespread and common species. It occurs in a block from E of Lüderitz across to W of Kimberley, SE to the E Cape and across to the SW Cape, but is concentrated in the E Cape.

CRASSULA NAMAQUENSIS **Schönland & Baker f.** This unmistakable dwarf species has three subspecies which are represented here: subsp. *namaquensis,* subsp. *comptonii* and subsp. *lutea*. The plants are dwarf perennials with basal rosettes, much crowded together. The leaves are densely covered with coarse recurved hairs. Their color is green to grey-green to red. The inflorescence is a rounded but sometimes irregularly branched thyrse up to about 40 mm long, covered with coarse recurved hairs. In subsp. *namaquensis* the leaves are broadly to narrowly elliptic to oblong and usually concave. Flowers are white or cream. In subsp. *comptonii* the leaves are blunt, almost globular and the flowers are yellow, rarely white. In subsp. *lutea* the leaves are narrowly elliptic, to broadly triangular in cross-section, but longer than the previous subspecies. The flowers are yellow.

Distribution: The subspecies *namaquensis* is found inland from about the Great Karasberg Mountains in S Namibia, southwards to about the Kamiesberg in the NW Cape. The subspecies *comptonii* occurs on Table Mountain sandstone near Nieuwoudtville. The subspecies *lutea* occurs on the E slopes of the Cedarberg and the Swartruggens Mountains in the E of the Tanqua Karoo.

CRASSULA NATALENSIS **Schönland** This attractive perennial or biennial species has one, rarely more, basal rosettes of spirally arranged leaf-pairs. The leaves are recurved, obovate, rarely elliptic, with a blunt tip. The leaves are glabrous but with marginal cilia, which are sometimes clavate. Their colour is green, often tinged with red, to red. The inflorescence is a thick thyrse. Flowers are in an umbel of many white flowers.

Distribution: in grasslands and amongst rocks on the slopes of the Drakensberg, central KwaZulu-Natal, the E Free State, Lesotho and into the N of the E Cape.

CRASSULA NATANS **Thunb.** This strange little annual species has long branches which are decumbent but are also found floating in moist depressions or standing water. They are few-branched and sometimes with underground branches. the tiny obovate to broadly lanceolate succulent leaves, up to about 2.5 mm long, are glabrous and whitish-green. The flowers are produced on short pedicels in the apex of the branch. They are white and sometimes tinged with pink.

Distribution: This is very widespread, occurring in the W from the Richtersveld, to Cape Agulhas, S & E parts the former Transvaal, NW Drakensberg in KwaZulu-Natal, the E & S Free State and the E Cape.

CRASSULA NUDICAULIS **L**. This attractive widespread clump–forming species is well-known in cultivation. The leaves are oblong-elliptic, are dull green, becoming red if exposed to high heat and sun. The leaves are smooth to slightly pubescent. The inflorescence is on a long slender pedicel and the flowers are creamy yellow. Three varieties are recognised, these are var. *nudicaulis,* var. *platyphylla* and var. *herrei.*

Distribution: The variety *nudicaulis* is widespread from the western Cape, through the NE Cape, Lesotho, eastern Free State and N central KwaZulu–Natal. The subspecies *platyphylla* is restricted to the mountains of the S Karoo, from Worcester, eastwards and as far as Prince Albert. They are also found near Beaufort West. The variety *herrei* occurs in the NW Cape between Kommagas and the Orange River.



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

Judd Kirkel Welwitch





Judd Kirkel Welwitch



Judd Kirkel Welwitch

1. ***Crassula muscosa*** in habitat near Laingsburg
2. ***Crassula namaquensis*** in habitat at Gamsberg, W of Pofadder
3. ***C. namaquensis*** **subsp.** ***comptonii*** in habitat at Vanrhyns Pass, W of Nieuwoudtville
4. ***C. namaquensis*** **subsp.** ***lutea*** in habitat at Swartruggens, NW Province
5 & 6. ***Crassula natalensis*** in habitat on the E foothills of the Natal Drakensberg
7 & 8. ***Crassula natans*** (7) the desiccated remains in dry, caked mud, in the Ceres Karoo (8) The floating flowers in a water puddle, at Caledon, SW Cape
9. ***Crassula nudicaulis*** **subsp.** ***platyphylla*** in habitat at Despatch, Near Port Elizabeth
10. ***C. nudicaulis*** **var.** ***herrei*** in habitat



Priscilla Burgoyne SANBI



Niels Jacobsen

Priscilla Burgoyne SANBI



Niels Jacobsen



***Crassula orbicularis* L.** This very common, though very variable species has four varieties recorded. So variable is the species that it is beyond the scope of this work to discuss these in any detail. The morphology of the leaves, the shape and size of the plants are the basic reasons for this variation. They range from fairly tall plants with large, broadly lanceolate, very fleshy leaves, through narrow-leaved, leaves with wavy margins, short stubby leaves etc. The flowers are basically similar: these are pendant tubular flowers on a tall peduncle and are usually red in colour.

Distribution: This very ubiquitous species is very common in the mountainous regions of southern Africa, which is its usual habitat.

***Crassula pellucida* L.** This is a very diverse species with a number of subspecies. To represent the group the subspecies *marginalis* and *alcinoides* are included here. The plants of this species are decumbent to prostrate with the old leaves not deciduous. The subspecies *marginalis* has sprawling branches with broadly ovate leaves with sharp tips. They are sessile and almost fused at the base to form a disk. Their colour is yellowish-green with red margins and central line. The subsp. *alsinoides* differs in its having single axillary flowers in one of the two leaves. The inflorescence of the species is a terminal fascicle with single to several white to pinkish flowers.

Distribution: The species is widespread from about Clanwilliam in the NW, through the W Cape, to the E Cape and N to the Limpopo Province. The subsp. *marginalis* occurs from W of Knysna to E of East London. The subspecies *alsinoides* has an enormous spread, from E tropical Africa southwards through the E coast to S Cape, but is not common.

***Crassula perfoliata* L**. This large, popular and striking perennial is an erect, little-branched plant which grows up to about 1.5 m tall. The grey leaves are erect and lanceolate (var. *perfoliata*) and falcate (var. *minor* - commonly known as *C. falcata*). The variety *coccinea* has somewhat larger flowers and the leaves are canaliculate, lanceaolate to triangular. The inflorescence is a capitate umbel of striking red to crimson flowers, sometimes pink with prominent yellow stamens.

Distribution: The variety *perfoliata* occurs between Graaff-Reinet, Port Elizabeth and W to Willowmore, N through KwaZulu-Natal to S Mpumalanga; var. *minor* occurs from East London to Willowmore. The subspecies *coccinea* occurs from around Grahams-town and around Port Elizabeth.

***Crassula plegmatoides* Friedrich** This is a dwarf perennial species which is erect, to decumbent with age and closely resembling in form such similar species as *C. columnaris*. It grows up to about 15 cm long or much longer in old specimens and branches quite freely. The stems are completely enclosed with the densely papillate, broadly ovate, closely adpressed, leaves. The inflorescence has a peduncle covered with dense recurved hair with a rounded cyme of cream flowers, which turn brown with age.

Distribution: Occurs in quartz gravel and deep sand from the Buchuberg Mountains in SW Namibia, to Port Nolloth in the N Cape.





Crassula plegmatoides
Left: in habitat in the lichen 'Red Beds' (*Telochistes capensis*) at Alexander Bay
Photo Judd Kirkel Welwitch
Below: in habitat at Alexander Bay,
Photo Niels Jacobsen



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Niels Jacobsen

1 - 5. ***Crassula orbicularis*** (1) in habitat
(2) In habitat in the Ecca Pass. NE of Grahamstown
(3) In habitat in Gatboskloof, near the Tradouw Pass, E of Swellendam
(4) In habitat, near De Rust, Little Karoo
(5) in habitat at Coega, NE of Port Elizabeth
6. ***Crassula pellucida*** **subsp. *alsinoides*** in cultivation at Gatboskloof
7. ***C. pellucida*** **subsp. *marginalis*** in habitat at Coega, NE of Port Elizabeth
8 - 9. ***Crassula perfoliata*** (8) in habitat
(9) Flower from Hectorspruit, Mpumalanga
10. ***C. perfoliata*** **var. *minor* (*falcata*)** in cultivation
11 - 12. ***C. perfoliata*** **var. *coccinea*** in habitat at Florida Hills farm, near Despatch, E Cape



Niels Jacobsen



Niels Jacobsen



Gerhard Beukes



Niels Jacobsen



Dawie Human



Niels Jacobsen

***Crassula pseudohemisphaerica* Friedrich** This is a small very short-stemmed species, which is up to 0.2 m tall when in flower, which bears it flat rosettes at ground level. The leaves are obovate to orbicular, in adpressed ranks of four. The leaves are glaucous green to yellowish green, but with a dense fringe of short cilia on the margins. The inflorescence is an elongated thyrse with pale yellow flowers, often tinged with brownish-red.

Distribution: In the shade of rocks on the S aspect of hilly country from Lüderitz to Vanrhynsdorp.

***Crassula pyramidalis* Thunb.** This perennial species, which is superficially similar to *C. muscosa* when not in flower, is erect, sometimes decumbent, which rebranches anywhere along the branches. It forms a small shrub, sometimes with many branches. These are up to about 60 cm long. The leaves are tightly adpressed together, completely hiding the stem. They are generally in ranks of four and are triangular, flattened. Their colour is blackish-green to light brownish-yellow. The inflorescence is a terminal cyme, partly hidden by the terminal leaves. Their colour is white or cream.

Distribution: Occurs from the Little Karoo, N, to the S Great Karoo and across to Somerset East in the E Cape.

***Crassula rubricaulis* Eckl. & Zeyh.** This succulent shrublet grows up to 35 cm tall. The stems are reddish-green with oblanceolate glabrous leaves with recurved marginal cilia. Their colour is green, sometimes with a reddish margin. The inflorescence is a round-topped thyrse of many white tubular flowers with recurved lobes.

Distribution: Occurs on the coastal mountains of the S Cape from about Knysna to Port Elizabeth.

***Crassula rupestris* Thunb.** This is a colourful shrub-like species, with many branches, with leaves which die off and drop, leaving ranks of terminal leaves with bare stems lower down. It grows up to about 0.5 m tall. The leaves greenish to yellowish to brownish with red to brown marginal markings. They are fleshy, lanceolate and are in ranks of four. The inflorescence is a short branched thyrse, reddish to green, with white to pink flowers.

Distribution: Occurs in a broad band from Vanrhynsdorp, across through Graaff-Reinet and through the Eastern Cape to the Great Fish River.



Judd Kirkel Welwitch



Priscilla Burgoyne SANBI



Niels Jacobsen

Niels Jacobsen





Niels Jacobsen



Judd Kirkel Welwitch



Robin Frandsen



Priscilla Burgoyne SANBI

Niels Jacobsen



1 - 3. ***Crassula rupestris*** (1) in habitat at Graaff-Reinet (2) In habitat near Ladismith, SW Cape (3) in habitat in the Swartberg Pass, S Cape
4. ***C. rupestris*** **subsp.** ***marnierana*** in habitat in the Swartberg Pass
5 - 7. ***Crassula pseudohemisphaerica*** (5 & 6) in habitat on the Anenous Pass, W of Steinkopf. (7) In habitat near Kommagas, W of Springbok
8 & 9. ***Crassula pyramidalis*** (8) in habitat NW of Laingsburg (9) In habitat near Ladismith, Little Karoo
10. ***Crassula rubricaulis*** in habitat at Gatbos, near the Tradouws Pass

Niels Jacobsen



Crassula sericea **Schönland** Is a variable small, usually much-branched, shrub with erect, rarely decumbent, branches up to about 0.2 m tall. The densely pubescent leaves are oblanceolate to obovate, also ovate to elliptic, are grey-green to greyish-brown, sometimes with red margins. The inflorescence is a thyrse, up to about 10 cm long and branching with a tight capitate cluster of cream to pale yellow flowers. The very variable variety *sericea* has rounded leaves with an apical keel to elongate without a keel and much crowded branches. The variety *hottentotta* has short erect branches with the internodes barely visible between the leaves. The leaves are ovate to elliptic, densely covered with coarse round papillae. The variety *velutina* has short decumbent branches with hidden internodes.

Distribution: The variety *sericea* occurs from Witputs and S to about Kommagas and E into Bushmanland. The variety *hottentotta* occurs from about Witputs to near Kommagas. The variety *velutina* occurs from narrowly into SW Namibia to narrowly into N Richtersveld on the W mountain slopes.

Crassula setulosa **Harv.** This very widespread and variable species has five varieties. Two subspecies are illustrated here. The wide variation is not sufficient however to make identification in this unique species difficult. It produces large mats or cushions of many rosettes, with the height of the plant up to about 0.25 m when in flower. The leaf-pairs are spirally arranged and are green, glabrescent or rarely glabrous and usually with a margin of white cilia. The inflorescence is a thyrse and the flowers are in a somewhat capitate cyme. Their colour is white.

Distribution: *Crassula setulosa* occurs in the E parts of South Africa and Zimbabwe.

Crassula sladenii **Schönland** Forms small shrubs with branches up to about 0.5 m tall, sometimes rebranching. The dead leaves are persistent. Leaves are ovate to lanceolate, pale whitish green with red margins and covered with fine pellucid dots. The inflorescence is a short terminal peduncle with a round to flat topped umbel of many white to pink flowers.

Distribution: Occurs narrowly from S & SE of Rosh Pinah in Namibia and across the Orange River into the Richtersveld.

Crassula susannae **Rauh & Friedrich** This charming dwarf species forms mats of canaliculate leaves which are mainly subterranean. The root is turnip shaped. The leaves are erect with their tips above ground. These are green with paler apices. The inflorescence is a head of white flowers which is proud of the tops of the leaves.

Distribution: At Riethuis in the Namaqua National Park, W of Kamieskroon.

Crassula swaziensis **Schönland** This is a short, perennial species with erect to decumbent branches growing up to about 30 cm tall. The leaves form a terminal rosette with the old leaves not usually deciduous. Both leaf surfaces are covered with hairs, becoming less towards the base. Rarely glabrous, the leaves are green to grey-green to brownish to pinkish green. The inflorescence is a long, well-branched peduncle with umbels of white campanulate flowers.

Distribution: Occurs from N Zimbabwe S to the mountains of E Limpopo Province, Across to the Magaliesberg and Mpumalanga, E Swaziland and into N KwaZulu-Natal.

Crassula tecta **Thunb.** This is a dwarf, low-growing species, branching frequently to form small clumps of rosettes. The leaves are oblong to oblanceolate. They are covered with hard irregular papillae. Their colour is grey-green. The inflorescence is an almost spherical thyrse of white or cream flowers, on a long papillate peduncle.

Distribution: Occurs in the Little Karoo on gently sloped stony hillsides from Montagu in the W, across to Oudtshoorn and also further E to Steytlerville.



Crassula tecta in habitat near Ladismith, Little Karoo
Photo Judd Kirkel



Priscilla Burgoyne SANBI



Judd Kirkel Welwitch



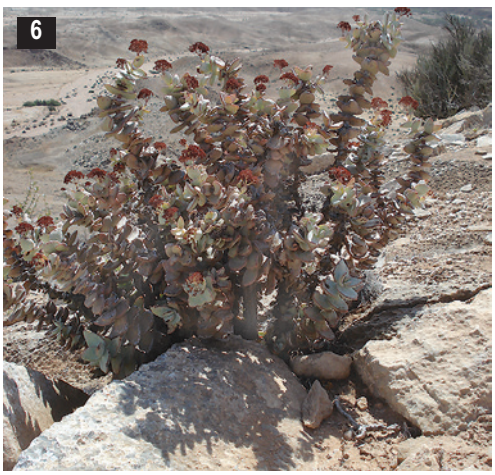
Priscilla Burgoyne SANBI



Judd Kirkel Welwitch



Gerhard Beukes



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch

1 - 3. ***Crassula sericea*** (1) in habitat in the Richtersveld (2) In habitat near Eksteenfontein, Richtersveld (3) In habitat near Potjespram, Richtersveld
4. ***C. sericea* var. *velutina*** in habitat in the N Richtersveld
5 ***C. sericea* var. *hottentotta*** in habitat near Aggeneys, W of Pofadder
6 & 7. ***Crassula sladenii*** in habitat in the Richtersveld mountains
8. ***Crassula setulosa*** in habitat in the Natal Drakensberg
9. ***C. setulosa* var. *jenkinsii*** in habitat at Breedts Nek, W of Pretoria
10. ***Crassula suzannae*** in cultivation
11 & 12. ***Crassula swaziensis*** (10) in habitat in the Magaliesberg Mountains, W of Pretoria. (11) In habitat



Judd Kirkel Welwitch

Priscilla Burgoyne SANBI





Priscilla Burgoyne SANBI

Judd Kirkel Welwitch



***Crassula tetragona* L.** This is a well-known perennial species with six subspecies, of which three are represented here. They are erect to decumbent branched shrubs, up to about 1 m tall, moderately branched. The leaves are in ranks of 4, on the upper parts of the branches. They are sessile, narrow and sharply-pointed. Their colour is green. The inflorescence is terminal with a short peduncle, about 3 cm long. The flowers are cream, rarely white. The subspecies *tetragona* has flattish leaves and distinct leaf-sheaths; subsp. *connivens* has almost flat flower heads with the flowers almost sessile; subsp. *robusta* has blunt, upward-curving larger leaves.

Distribution: Occurs widely from just S of the W Orange River to W of the Kei River, E Cape. subsp. *connivens* occurs on the sunny sides of the mountains in the Little Karoo and the S Great Karoo and subsp. robusta in the river valleys of the E Cape.

***Crassula tomentosa* Thunb.** This charming, little cluster-forming perennial or biennial species, with one to few, rarely many rosettes. It usually has ovate, often obovate, leaves which are dark to light green suffused with purple. The spirally arranged leaves are densely hairy (rarely glabrous). They are up to about 0.6 cm tall. The inflorescence is a spike-like thyrse with the sessile white to yellow flowers in a dense cluster.

Distribution: This is a W coastal species, occurring from S Namibia to the Cape Peninsula and across to Laingsburg in the Great Karoo.

***Crassula umbella* Jacq.** This diminutive shade-loving perennial grows up to about 1.5 cm tall The stem, which is produced from a small subterranean tuber, is erect and solitary and the crenate glabrous leaf is joined in a hardly-fleshy circular disc around the stem. The colour is green to usually yellowish-green. The small elongated flower thyrse is borne on a peduncle of up to about 1 cm tall. Flowers are star-shaped and cream to yellowish-green, rarely white.

Distribution: Widely distributed from the Richtersveld mountains, where it is rare, S along higher ground to Montagu and E to as far as Humansdorp. Most common in the Kamiesberg and Cedarberg.

***Crassula vaginata* Eckl. & Zeyh.** This tall, striking species, is close to *C. alba*. It is a robust plant and when in flower it is up to about 60 cm tall. Leaves are glabrous or with some cilia; they are linear to lanceolate, green to yellow-green with stiff white cilia on the margins. The Flowers are many in a flat-topped umbel produced from several branches and rebranches. Their colour is yellow, but white flowers occur N of the Limpopo River.

Distribution: This very widespread species favours grasslands and is present from the E Cape in the S, to Ethiopia in the N.

Kalanchoe Adans.

The genus *Kalanchoe* is well represented throughout Africa and in Madagascar, where a large number of interesting *Kalanchoe* species are found. It occurs widely across the East as far as China and Taiwan as well as in Tropical America. Approximately 15 species occur in our region.

***Kalanchoe crenata* (Andr.) Haw.** This species produces one to few erect branches up to 1.2 m tall. The cordate leaves are glabrous to hairy with crenulate edges which are somewhat folded. Their colour is yellowish-green to green. The inflorescence is a rounded thyrse with several branched petioles. The flowers are yellow to orange.

Distribution: Favours moist areas and forest edges and occurs from central KwaZulu-Natal to the eastern Cape

Kalanchoe crenata in habitat in the E Cape
Photo Darrel Plowes





Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



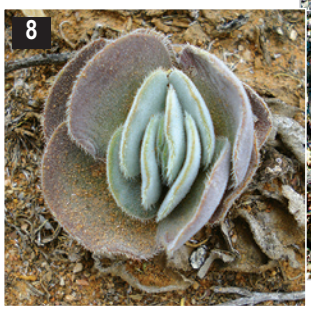
Judd Kirkel Welwitch



Robin Frandsen

1. ***Crassula tetragona*** in habitat at Komsberg, N of Laingsburg
2. ***C. tetragona*** **subsp**. ***connivens*** in habitat in the Little Karoo
3. ***C. tetragona*** **subsp.** ***robusta*** in habitat at Committees, NE of Grahamstown
4, **5 & 6**. ***Crassula umbella*** (4 & 5) in habitat in the Cedarberg. (6) In habitat in shade at Louis Leipold's Grave, Cedarberg
7 & 8. ***Crassula tomentosa*** in habitat
9 - 11. ***Crassula vaginata*** (9 & 10) in habitat. (11) In habitat at Rukotso, Nyanga Downs. E Zimbabwe



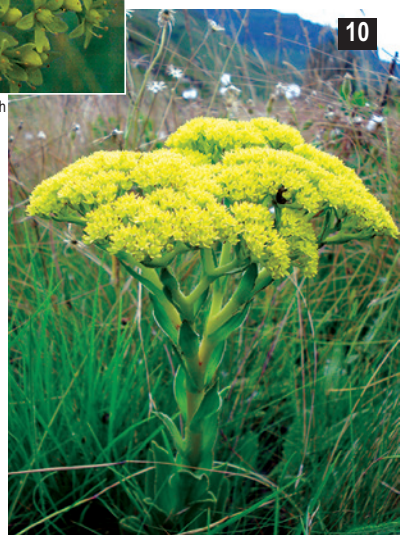


7 & 8 Judd Kirkel Welwitch

Darrel Plowes



Judd Kirkel Welwitch





***KALANCHOE ROTUNDIFOLIA* (Haw.) Haw.** This very complex and variable species has erect branches and grows up to about 1.2 m tall. The leaves vary considerably, even on the same plant and are entire, crenulate, broadly to narrowly lanceolate and even three-lobed. The inflorescence is a rounded thyrse with many dichasia, The umbel of 4-petalled flowers varies from yellow through orange to deep red.

Distribution: Extremely widespread from the E Cape, KwaZulu-Natal, Swaziland, Mozambique, across through Mpumalanga, NW Province, N through Botswana, Zimbabwe and N to Kenya and Socotra.



Kalanchoe rotundifolia in cultivation
Photo Judd Kirkel Welwitch

***KALANCHOE THYRSIFLORA* Harv.** This species produces usually only one stem which is usually ridged. It develops large rosettes of sessile, obovate leaves rounded at the tips. Their colour is whitish due to the mealy bloom. The leaves usually have reddish-tinged margins. The inflorescence is a slender, elongated thyrse with many dischasia with clusters of grey-green flowers covered with a thick bloom and borne on short pedicels.

Distribution: Common in the mountain ranges of Gauteng, and along the foothills of the Mpumalanga Drakensberg and S to central KwaZulu-Natal, the NE Cape, E Free State and Lesotho and SE Zimbabwe.

TYLECODON Toelken

The name of this genus is an anagram of the genus *Cotyledon.* What separates *Tylecodon* from *Cotyledon* is the spirally-arranged, non-waxy, soft deciduous leaves of this genus, which leave behind a persistent hard leaf-base attached to the stem. These phyllopodia are, however, absent in some of the species.

***TYLECODON BUCHHOLZIANUS* (Schuldt. & Steph.) Toelken** Two varieties are recognised of this interesting species: var. *buchholtzianus* and var. *fasciculatus*. The nominate species has somewhat swollen and irregular branches, up to about 0.3 m tall. The stems are greyish with peeling bark. The glabrous leaves are linear incurved green, usually with reddish tips and often with brown striations. The inflorescence is a thyrse with 1—3 monochasia with 1 or 2 whitish, pink or deep red flowers. The variety *fasciculatus* differs in its low, spreading growth habit, which may be pendulous. The stems are many-branched and rebranched. The texture is grey and scaly, spotted with blackish axils. The plant rarely produces leaves and then only one or two from the apex. The inflorescence produces 1 monochasium, with 1 yellowish-green flower streaked with pink.

Distribution: The nominate variety occurs in SW Namibia and into the region around the Orange River Mouth in S Africa. The variety *fasciculatus* inhabits the E slopes of the Oograbies Mountains, E of Port Nolloth.

***TYLECODON GRANDIFLORUS* (Burm. f.) Toelken** This spectacular species has a short, simple or little-branched tuberculate stem caused by persistent leaf-scars, which is usually well-hidden in rank fynbos. The leaves are linear to broadly lanceolate, edged with red and suffused with red underneath. The inflorescence is a thyrse, with striking reddish-orange, long tubular flowers.

Distribution: Occurs on the mountains of the Cape Peninsula, but is occasionally found on the west coastal mountains as far N as Clanwilliam.



Niels Jacobsen



Niels Jacobsen



Darrel Plowes



Darrel Plowes



Priscilla Burgoyne SANBI



Gerhard Beukes



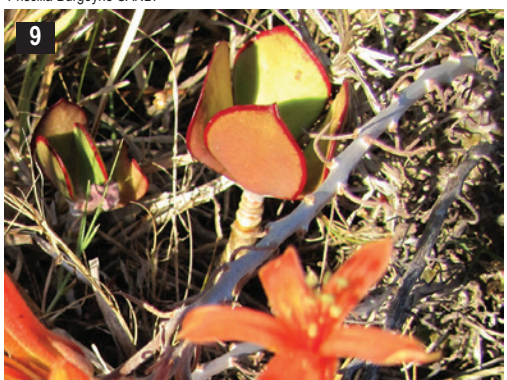
Gerhard Beukes



Robin Frandsen

1 & 2. ***Kalanchoe thyrsifolia*** in habitat.
Note the dying-off of the foliage when in flower
3 & 4. ***K. thyrsifolia 'wildii'*** in habitat near the Kyle Dam, Masvingo, Zimbabwe
5 - 7. ***Tylecodon buchholtzianus*** (5) in habitat in NW Richtersveld
(6 & 7) In habitat in the Anenous Pass, SW Richtersveld, W of Steinkopf
8. ***T. buchholtzianus* var. *fasciculatus*** in habitat on the E side of the Oograbies mountains, growing in close asscociation with *Conophytum stephanii,* with *Haworthia arachnoidea* in the centre of the clump and *Crassula plegmatoides,* .
9 & 10. ***Tylecodon grandiflorus*** in habitat at Olifantsbos, Cape Point

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Tylecodon hallii **Toelken** This is a perennial with thick, stems and branches which are many-rebranched. The thick stem is up to about 6 cm in diameter and the plant grows to about 30 cm tall. The bark is usually dark-grey and flaky, The glabrous leaves are yellowish-green to brown and are linear-lanceolate, terete sometimes with a groove in the upper surface. The inflorescence is a terminal thyrse with one to several monochasia. The flowers are yellowish-green or brown.

Distribution: Occurs on both sides of the lower Orange River.

Tylecodon paniculatus **(L.f.) Toelken** This well-known and common perennial species, known as the *Botterboom* - Butter Tree, produces a large, thick stem and is much branched. The stems and branches are yellowish to yellowish-green with peeling bark. The branches are extended by a long red peduncle with a loose panicle of yellowish-orange to red flowers.

Distribution: Widespread from an isolated occurrence in the Auas Mountains, central Namibia to the Karas Mountains in the S; along and inland of the W coast of S Africa, into the Little Karoo and mountains of the S Great Karoo, on rocky slopes and also on sandy plains near the W coast.

Tylecodon pearsonii **(Schönland) Toelken** This perennial usually develops only one stem, up to 150 mm long, from a swollen base. Its colour is greyish to greenish-brown which has almost white circular phyllopodia. The plant, with age, has peeling bark. The glabrous greyish to greenish-brown leaves are linear to linear-lanceolate, abruptly cuneate, sometimes terete or flat. The inflorescence is a thyrse, with rarely more than three monochasia. The flowers are pubescent, brownish in colour with darker indistinct venation.

Distribution: Occurs from SW Namibia, south to about Vanrhynsdorp.

Tylecodon pygmaeus **(W.F. Barker) Toelken** This diminutive species is very difficult to spot in its habitat of white quartz pebbles or brown rough shale. The diminutive stems are up to about 2 cm tall and proportionally robust. They are usually single, rarely few. The bark is grey, sometimes with darker longitudinal striations. The green- to coppery-coloured leaves are channelled and usually obtuse and covered with chrystalline elongate trichomes. The inflorescence is a thyrse with up to 5 monochasia with flowers which are pale, yellowish-green, sometimes tinged with pink.

Distribution: confined to the Knersvlakte where it occurs amongst the quartz-pebbles.

Tylecodon racemosus **(Harv.) Toelken** This species is a perennial with short erect sparsely branched stems up to about 3.5 cm tall. The branches have pale brown peeling bark. Leaves are very variable and are terete, linear or rarely obtuse. They are green and glabrous or pubescent. The old dried leaves peel off with the bark. The inflorescence is a thyrse with a head of pale-green to whitish flowers.

Distribution: Occurs from near Witputs in Namibia, mainly W of the mountains and E to about Steinkopf.



Tylecodon racemosus in habitat in the Richtersveld *Photo Niel Jacobsen*

Tylecodon reticulatus **(L.f.) Toelken** This is a perennial thick-stemmed species up to about 32 cm tall. It generally branches sparingly. The stems and branches are covered with yellowish peeling bark, with short circular phyllopodia on young branches, visible for a short time. The yellowish-green leaves are usually



Priscilla Burgoyne SANBI



Gerhard Beukes



Priscilla Burgoyne SANBI



Gerhard Beukes







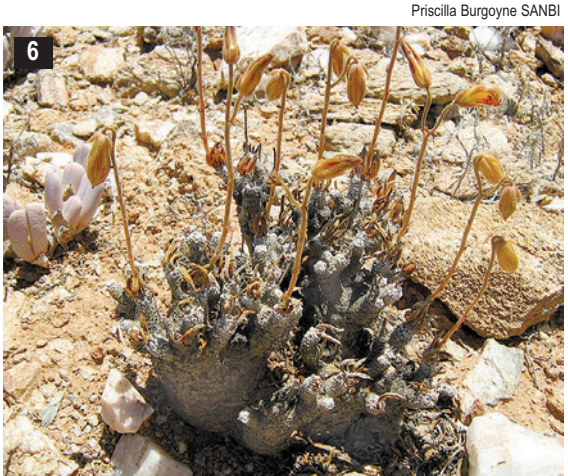
Robin Frandsen. Inset Gerhard Beukes



Niels Jacobsen

1 & 2. ***Tylecodon hallii*** (1) in habitat on the farm Sperlingputs, Warmbad, Namibia
(2) In habitat on Helskloof, Richtersveld
3 - 5. ***Tylecodon paniculatus*** (3) in habitat in the Richtersveld. (4) Inflorescence from Helskloof, Richtersveld. (5) In habitat in the Robertson Karoo, S of Worcester, with close-up of the flower
6. *Tylecodon pearsonii* in habitat at Goodhouse, N Bushmanland
7 & 8. ***Tylecodon pygmaeus*** (7) in habitat in the central Knersvlakte
(8) In habitat in the central Knersvlakte, with *Argyroderrma delaetii*
9 & 10. ***Tylecodon reticulatus***
(9) in habitat NW of Laingsburg
(10) In habitat at near Pofadder, Bushmanland

Priscilla Burgoyne SANBI



Robin Frandsen



Judd Kirkel Welwitch



somewhat terete to lanceolate with margins curved upwards. The inflorescence is a thyrse with many monochasia, each with up to 10 (usually up to 6) yellowish-green small flowers. The tall, up to about 7 cm, much-branched rigid inflorescence is persistent. The result is the plant is covered with long, pungent 'thorns'. The young branches of the subspecies *phyllopodium* are covered with phyllopodia, each with a more or less circular leaf-scar which is visible for several years.

Distribution: The nominate subspecies occurs from the Karas Mountains in Namibia, southwards to near Pofadder and across to just N of Port Nolloth and southwards to about Elands Bay and E across to the Tanqua Karoo and through to about Willowmore. The subsp. *phyllopodium* is confined from near Witputs in S W Namibia and S to about Kommaggas.

TYLECODON RUBROVENOSUS **(Dinter) Toelken** This variable perennial species has a thick stem and branches sparsely. It is up to about 25 cm tall. The stem is covered with phyllopodia which later peel off with the bark. The green to bluish-green leaves are variable, from long-linear to shortly clavate, with a central groove, sometimes with reddish longitudinal striae. The pubescent inflorescence is a long straight monochasia which usually zig-zags when young, each with 4—9 yellowish-green flowers. The leaves are shed before flowering takes place.

Distribution: Occurs on both sides of the lower Orange River, to as far E as Prieska.

TYLECODON SCHAEFERIANUS **(Dinter) Toelken** This diminutive species is very difficult to spot in its habitat of brown rough quartzitic outcrops and sand. It sometimes forms dense mats. It has a branched underground tuber with very few erect branches, which are smooth with pale flaking bark. The glabrous leaves are elliptic and obtuse, flat to channelled above, with a few scattered hairs when young. Their colour is green to pale brown with brown-red striations or flecks. The inflorescence is a monochasium with one (very rarely two) violet, to pink or, rarely, white flowers.

Distribution: Occurs along the coast from N of Lüderitz to just S of the Orange River in the Richtersveld.

TYLECODON SULPHUREUS **(Toelken) Toelken** This diminutive perennial has branched underground tubers which produce short, erect stems, barely 3 cm tall or barely above ground. These are covered with pale phyllopodia. The leaves are oblanceolate to spathulate and usually obtuse. The inflorescence is a proportionally large thyrse with 1 or more monochasia, bearing large yellowish-green tubular glandular-pubescent flowers.

Distribution: Occurs in Bushmanland from Pofadder to Goodhouse.

TYLECODON WALLICHII **(Harv.) Toelken** This is a much-branched perennial with erect stems up to about 0.8 m tall. The stems and branches are covered with somewhat elongated phyllopodia. The grey-green to brownish and glabrous leaves are narrow, terete and often grooved above. The nodding flowers are glabrous, about 2 cm long, green and red-dotted towards the tip. The subspecies *ecklonianus* differs in the glabrous corolla of the flowers.

Distribution: The subspecies *wallichii* is widespread in the W Cape from Kamieskroon, S along the W lower slopes of the Cape mountains, in the SW parts of the Great Karoo and widespread in the Little Karoo. The subspecies *ecklonianus* occurs from about Aus, in S Namibia to near Kamieskroon in South Africa, also on the lower slopes of the mountains.

PEDALIACEAE **R. Br.**

This is a small, mainly subtropical family, most of which are endemic to tropical Africa. Most of its members are herbaceous but a few are shrubs or small trees.

PTERODISCUS **Hook**.

PTERODISCUS SPECIOSUS **Hook.** This charming little succulent is somewhat reminiscent of a miniature *Adenium*, with which it has no relationship. The simple stem is produced from a swollen tuber, it is up to about 20 cm tall and is swollen to globose at the base from which many linear to linear oblong leaves, which are up to about 6 cm long, are dentate or shallowly incised are produced. The long trumpet-shaped flowers are white over pink to red.

Distribution: Occurs in Griqualand West, across the Free State, N to N Gauteng and E Mpumalanga.



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Gerhard Beukes



Priscilla Burgoyne SANBI

1 & 2. ***Tylecodon rubrovenosus*** in habitat near Steinkopf
3. ***Tylecodon schaeferianus*** in habitat at Lüderitz
Inset: flower from a plant at Buchuberg, near Alexander Bay
4. ***Tylecodon sulphureus*** in habitat near Pofadder
5.& 6 ***Tylecodon wallichii*** in habitat
7. ***T. wallichii*** **subsp. *ecklonianus*** (6) in habitat near Nababeep, N of Springbok,
(7) inflorescence from Helskloof, Richtersveld
8 & 9. ***Pterodiscus speciosus*** in habitat near Hoopstad, SE of Bloemhof, North West Province



Gerhard Beukes



Org Fritz



Robin Frandsen. Inset Gerhard Beukes





Gerhard Beukes



Org Fritz

Sesamothamnus Welw.

***Sesamothamnus benguellensis* Welw.** This shrub is up to about 2 m tall and of very variable habit. In age it develops a shortish swollen caudex which could be up to about 1 m in diameter. This divides into numerous erect or oblique thick branches with many sharp spines. The glaucous leaves are obovate-spathulate or obtuse. Sweet-scented white to pale-pink flowers are produced in racemes.

Distribution: N Namibia, Kaokoland, through to N Angola.



Sesamothamnus benguellensis
on habitat at Okabembi, NW Namibia
Photo Niels Jacobsen

***Sesamothamnus guerichii* (Engl.) Bruce** This large shrub-like tree, up to 2.5 m to 4 m, forms clusters of stems which expand into short caudex-like bases, rather abruptly thinning into erect to sub-erect branched very thorny stems. Their colour is buffy-yellow with peeling blackish remnant bark patches. Leaves are small and cluster closely on the stems and branches. Flowers are golden-yellow.

Distribution: Occurs in NW Namibia, away from the coast from NW of Windhoek into Kaokoland and into Angola. Concentration is greatest in the SE of the range.

***Sesamothamnus lugardii* N.E. Br.** This forms a large shrub-like tree which may reach as tall as 5 m. It generally forms a very large but short caudex which may be up to 2 m in diameter, from which variable spreading to erect, tapering branches are produced. Leaves form in clusters from the axils of the acute spines. The white flowers have a long thin tube.

Distribution: Occurs across the Limpopo Province and concentrated N of the Soutpansberg, into Zimbabwe and into E central Botswana.

PORTULACACEAE Juss

This is a medium-sized group of succulent plants. They are more or less fleshy herbs and shrubs which are represented internationally. The succulent plants which concern us, *Anacampseros, Avonia, Ceraria* and *Portulacaria,* occur only in southern Africa with the exception of *Anacampseros rhodesica,* which is also found in Somalia.

Anacampseros L.

This is dwarf succulent genus which rarely forms a caudex. The leaves are usually tightly packed on the stems and are usually tomentose or cobwebby. The leaf-axils often have bristles and long or short hairs.

***Anacampseros albidiflora* V. Poelln.** This species is similar to *A. filamentosa.* It produces its leaves from a swollen base and becomes shortly and sub-erectly columnar with tightly-packed, ovoid to sub-globose orange-red to brownish, verruculose, shiny leaves with down-curving tips, which are densely tomentose. The leaf-axils have long glossy curly white hairs, The inflorescence is short with few white to pale pink flowers.

Distribution: Widespread in the Little and Great Karoo.

***Anacampseros arachnoides* (Haw.) Sims** This species has short rather lax columnar branches of greenish to bronze, tightly-packed leaves, up to about 5 cm long. They are markedly acuminate with a sharpish, slightly recurved tip and somewhat covered with spiderweb-like hairs. The axils have short hairs and bristles. The inflorescence is up to about 8 cm tall. The flowers are white, tinged with pink or striped with pale purple or pink. They open in the afternoon.

9 & 10 Priscilla Burgoyne SANBI







Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch





5 & 6 Darrel Plowes

Judd Kirkel Welwitch

1 - 3. ***Sesamothamnus guerichii*** in habitat NW of Windhoek
4 - 7. ***Sesamothamnus lugardii*** (4, 5 & 6) in habitat at Penge, W Limpopo Province
(7) In habitat 80 km W of Beitbridge
(6) Leaves and flowers
8. ***Anacampseros albidiflora*** in habitat at Klipplaat, W of Jansenville, E Cape
9 & 10. ***Anacampseros arachnoides*** in habitat on the Cradock Hill



Priscilla Burgoyne SANBI



Distribution: Occurs from the Little to the Great Karoo across to the E Cape.

ANACAMPSEROS BAESECKEI **Dtr.** The dense white-felted leaves of this species, rich carmine petals and habit are almost indistinguishable from *A. filamentosa*. The plant forms short columns of felty, tightly packed leaves which are reddish-green, but obscured by the felt. The axils are hairy with longish hairs and bristles. The previously recorded *A. crinita,* which has since been included in this species, is distinguished by its longer brown bristles and larger leaves.

Distribution: Occurs in S Namibia in the Klein Karas Mountains, S through Warmbad, through to Steinkopf and the Richtersveld.

ANACAMPSEROS DECAPITATA **Burgoyne & J. van Thiel** This relatively newly-described species is similar to *A. subnuda*. But it differs in its leaf-form. It forms small tufts up to about 2 cm of spiral rosettes with tightly-packed leaves from a small caudex. The leaves are obovate, cuneate and rounded. Their colour is bright green. The axils of the leaves produce clusters of long lanate white hairs. The inflorescence is up to about 35 mm with 1—5 flowers which are bright satiny-pink and open in the afternoon for not much over one hour.

Distribution: Known only from the summit of the Magaliesberg, W of Pretoria.

ANACAMPSEROS FILAMENTOSA **(Haw.) Sims** This species forms small clumps up to about 10 cm in height. The branches are erect to sub-erect and columnar. The leaves are tightly-packed, ovoid to sub-globose, retused and chinned. Their colour is dark-green and covered with cobwebby hairs. Inflorescence is up to about 8 cm tall. Flowers are a bright pink. Very little separates subsp. *filamentosa* and subsp. *namaquensis* and the separation is probably not valid.

Distribution: Wide distribution from N Namibia, to the Richtersveld and E to Botswana, the Free State and central Karoo.

ANACAMPSEROS LANCEOLATA **(Haw.) Sweet** This species is somewhat similar to *A. telephiastrum,* but is the largest of the species. The plant forms clumps with the leaves, which are produced on short branches, being more lanceolate and longer with a spiny tip. They are green, smooth and papillate. The hairs at the axils sometimes exceed the length of the leaves. The purple inflorescence is up to about 25 cm tall. The flowers are showy, carmine or white.

Distribution: In a long, narrow swath from the Richtersveld to the Overberg, E to the Little Karoo and E to Uniondale.

ANACAMPSEROS MARLOTHII **V. Poelln.** This little-known tuft-forming species arises from a taproot, producing a closely-packed mound of short, blunt obovate to lanceolate leaves, which are somewhat incurved, green above and purplish below; glabrous and somewhat transversely rugose. Leaf-axils have long bristles. The inflorescence is about 3 cm long. Flowers are carmine-red, lighter towards the centre.

Distribution: Reported from the Sutherland district.

ANACAMPSEROS RETUSA **Poelln.** This species resembles *A. filamentosa*, but without the leaf-hairs. The plants have a thick greyish stem and forms level mats of flat-topped rosettes. The green to purplish-green, rugulose leaves are tightly packed and wedge-shaped and slightly channeled on the apex. The axils have long lanose hairs and bristles. The inflorescence is short with a few branches. Flowers open in the late afternoon for 3—4 hours, they are palest white-pink to pink.

Distribution: occurs from the Ceres Karoo NW into the Richtersveld in South Africa and N to near Lüderitz in Namibia.

ANACAMPSEROS RUFESCENS **(Haw.) Sweet** This is another look-alike of *A. telephiastrum* but has thicker leaves, is more tapered, ending in a sharpish tip. This

Priscilla Burgoyne SANBI





Priscilla Burgoyne SANBI



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch

1 - 3. ***Anacampseros baeseckei*** (1) in habitat near Steinkopf
(2 & 3) In habitat, plant originally described as *A. crinata*
4 - 6. ***Anacampseros decapitata*** in habitat
7 - 9. ***Anacampseros filamentosa***
(7) In habitat near Vryburg, N Cape
(8) in habitat near Kendrew, S of Graaff-Reinet
(9) ***A. filamentosa* subsp. *namaquensis*** in habitat
10 & 11. ***Anacampseros marlothii*** (10) in association with *Crassula corallina*. (10 & 11) in habitat at Komsberg, SE of Sutherland
12 & 13. ***Anacampseros lanceolata*** in habitat 40 km E of Springbok
14. ***Anacampseros retusa*** in habitat in the Knersvlakte
15. ***Anacampseros rufescens*** in habitat near Kingwilliamstown



Judd Kirkel Welwitch



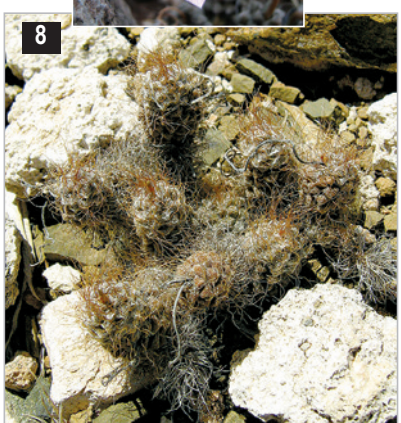
Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI

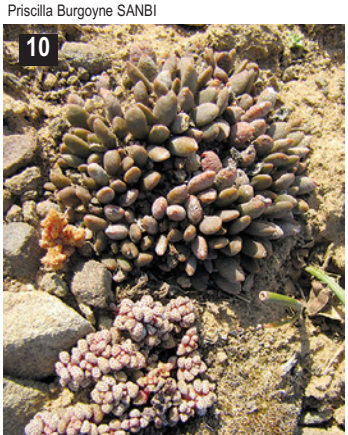
7, 8 & inset Priscilla Burgoyne







Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



forms a compact tuft with the leaves forming a dense and distinct spiral rosette. The acuminate leaves are obovate to lanceolate with the upper surface flat and sparsely tomentose with numerous hairs in the axils. The plant's colour is green with a general purplish tinge which is more pronounced on the underside. The inflorescence is tall, up to about 10 cm. The flowers are carmine.

Distribution: This is a very widespread species occurring from S Lesotho, through S Free State, S to Middelburg to the S Cape and across to E of Queenstown.

ANACAMPSEROS SUBNUDA **Poelln.** This species forms low mounds of up to about 5 cm from a thick gnarled rootstock. The leaves are borne in tight rosettes with white lanate axilliary clusters. The greenish to purplish leaves are thick, with a flattened pimpled upper surface. The axilliary hairs are in lanate clusters. The inflorescence is up to about 15 cm tall. Up to 6 flowers are produced, these are open in the afternoon for about 3 hours, they are white or pink

.

Distribution: Occurs along the summit of The Magaliesberg Mountains and across to SE Botswana.





Anacampseros subnuda in habitat near Parys, Free State Province *Photos Priscilla Burgoyne SANBI*

ANACAMPSEROS TELEPHIASTRUM **DC.** This is a miniature clump forming species, barely 5 cm tall, which forms tightly packed fleshy smooth, bronze-coloured, papillate leaves on short branches which are ovate, obovate or elliptical. The axils have hairs shorter than the leaves. The inflorescence is up to about 15 cm with hairy axils. Flowers are 1—4 and open in the afternoon.

Distribution: Occurs from near Grahamstown across the S Cape to Prince Albert and through the Little Karoo.

AVONIA (E. Meyer ex Fenzl) G.D. Rowley

This unusual little genus was originally included in *Anacampseros.* The somewhat curved and often decumbent branches have the appearance of bird-droppings and indeed it has the unfortunate name of the 'bird-dropping plant'. The columnar branches are covered with stipular scales on the tips of the leaves which often entirely hides them. The flowers are often sessile and almost hidden in the apical scales.

AVONIA ALBISSIMA **(Marl.) G.D. Rowley** This dwarf succulent forms tufts, with the branching low down. It is up to about 4 cm tall with the curved stems and leaves heavily cloaked with white, sometimes with dark spots, leaf-scales. The scales are broad, ovate and dished, pure white occasionally with brownish tips. The short axilliary hairs are completely obscured by the scales. The scented flowers are 1—3, cupped on the stem's apices. They are white.

Distribution: Broadly distributed from the W coast across to Griqualand West.

AVONIA PAPYRACEAE **(Fenzl) G.D. Rowley** The difference between the subsp. *papyracea* and the subsp. *namaensis* is very slight and the separation may not necessarily be taxonomically viable. The differences lie in the characteristic entire margins of the scales of the former and the serrate scales of the latter. There are some small differences in the characteristics of the seed. Branches are up to about 8 cm tall, they radiate from the crown of a thick taproot. They are erect to lax and tend to recurve downwards and branching. The leaves and stems are covered tightly by the white scales. The self-fertile scented flowers are produced from between the apical leaves. These are almost circular and white, opening late afternoon.



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch





Priscilla Burgoyne SANBI

1 & 2. ***Anacampseros telephiastrum*** (1) in cultivation and in flower.
(2) In habitat with opening flower
3 - 5. ***Avonia albissima*** in habitat near Kakamas, Bushmanland
6 & inset. ***Avonia papyracea*** **subsp.** ***papyracea*** in habitat near Worcester, SW Cape
7 & 8. ***Avonia papyracea*** **subsp.** ***namaensis*** in habitat at (7) Henkries, E of Goodhouse. (8) Near Pofadder



Priscilla Burgoyne SANBI

Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Distribution: Very widespread, but disjunct, across from S Namibia, Warmbad, the Richtersveld, E to Upington, Little Karoo and S Great Karoo.

AVONIA QUINARIA **(Fenzl) G.D. Rowley** This very popular species has two subspecies: *quinaria* and *alstonii*. They are dwarf caudiciforms with a large flattened buried caudex, up to about 6 cm in diameter in subsp. *alstonii*, with only the leaf-tips showing. The branches can be numerous with as many as 300 on old plants. The branches are deciduous, up to about 5 cm long but very much longer when flowering. The scale-covered branches are silvery in appearance. The extraordinary flowering stems extend and are subtended by large and showy flowers. The differences between the two species are as follows: subsp. *quinaria* has the leaves and scales spiraled, has carmine flowers and is a smaller plant. The rarer subsp. *alstonii* has the leaves and scales in straight rows and the flowers are white or rarely pink.

Distribution: Widespread in S Namibia, Bushmanland, and Namaqualand as far S as the Kamiesberg.

AVONIA RECURVATA **(Schönland) G.D. Rowley** This strange fluffy little plant has many decumbent or erect branches up to about 7 cm long. The little leaves are lanceolate to ligulate. Stipular scales cloak the stems and hide the leaves and these almost hidden leaves are pale or purple-green. The axils have a few short hairs. The flowers are sessile between the apical scales and are scented and white.

Distribution: Occurs from S Richtersveld across the around Kenhardt in Bushmanland.

AVONIA RHODESICA **(N.E. Br.) G.D. Rowley** This species has a small caudex with many small pointed branches, up to about 3 cm tall, tightly covered with white scales which half-hide the green leaves. The white to pink flowers open in the late afternoon.

Distribution: Occurs in the Limpopo Province in South Africa, NE Botswana, in the granite outcrops in E Zimbabwe and with outlier populations in Somalia, N Africa.

AVONIA USTULATA **(Fenzl) G.D. Rowley** This species is a duller-grey than the other species. It is intricately branched, forming a compact clump. It is miniature up to about 3 cm tall, forming an almost spherical clump. The leaves are hidden and the adpressed scales have a brown spiny tip which is sometimes curved outwards. The sessile flowers are scented and white.

Distribution: Widely distributed through the central and eastern Great Karoo, into the Free State and the E Cape.

CERARIA H. Pearson & Stephens

This genus consists of four species which inhabit the driest parts of the N Cape Province and S Namibia. They are small to large shrubs. The branches have tiny sessile leaves. Two species are represented here.

CERARIA FRUTICULOSA **H. Pearson & Stephens** This is a low-growing, intricately branched shrublet which grow up to about 1.5 m tall. The stem and branches are slender and glabrous, whitish when young becoming pinkish-brown. The small deciduous sessile leaves are green. The flowers are pinkish white and are produced in racemes at the end of the branches.

Distribution: Occur from S of Lüderitz - in the Klinghardt Mountains, to Keetmanshoop, across to Warmbad in Namibia and in the Kaokoveld in NW Namibia.

CERARIA NAMAQUENSIS **(Sond.) H. Pearson & Stephens** This is the showiest of the genus. The whitish stems and branches are sub-erect to erect have transverse oval scars and are liberally covered with tiny clavate silvery-green, glittering sessile leaves. It can grow in excess of 2 m. The flowers are produced on small subsidiary twigs at the tips of the branches, are tiny and pink in colour.





Ceraria namaquensis in habitat in the N central Richtersveld National Park
Photos Robin Frandsen



Judd Kirkel Welwitch



Judd Kirkel Welwitch



7, 8 & 9 Judd Kirkel Welwitch







Priscilla Burgoyne SANBI



Priscilla Burgoyne SANBI



Niels Jacobsen



Judd Kirkel Welwitch



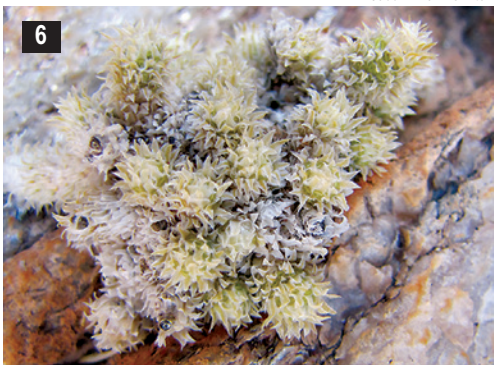
Priscilla Burgoyne SANBI

Judd Kirkel Welwitch



Judd Kirkel Welwitch

1 & 2. ***Avonia quinaria*** **subsp.** ***quinaria*** in habitat inat sunset near Kamieskroon
3 & 4. ***A. quinaria*** **subsp.** ***alstonii*** in habitat near Pofadder
5 & 6. ***Avonia recurvata*** in habitat (5) near Pofadder. (6) near Aggeneys
7 - 10. ***Avonia rhodesica*** in habitat at Kyles Dam, SE Zimbabwe. (10) Flowers from Blouberg, Limpopo Province
11 & 12. ***Avonia ustulata*** in habitat near Steynsburg, Great Karoo
13 & 14. ***Ceraria fruticulosa*** in habitat near Aggeneys



Judd Kirkel Welwitch



Judd Kirkel Welwitch



Distribution: Occurs from S of Lüderitz in Namibia across to Warmbad, S to Augrabies and into the Richtersveld National Park.

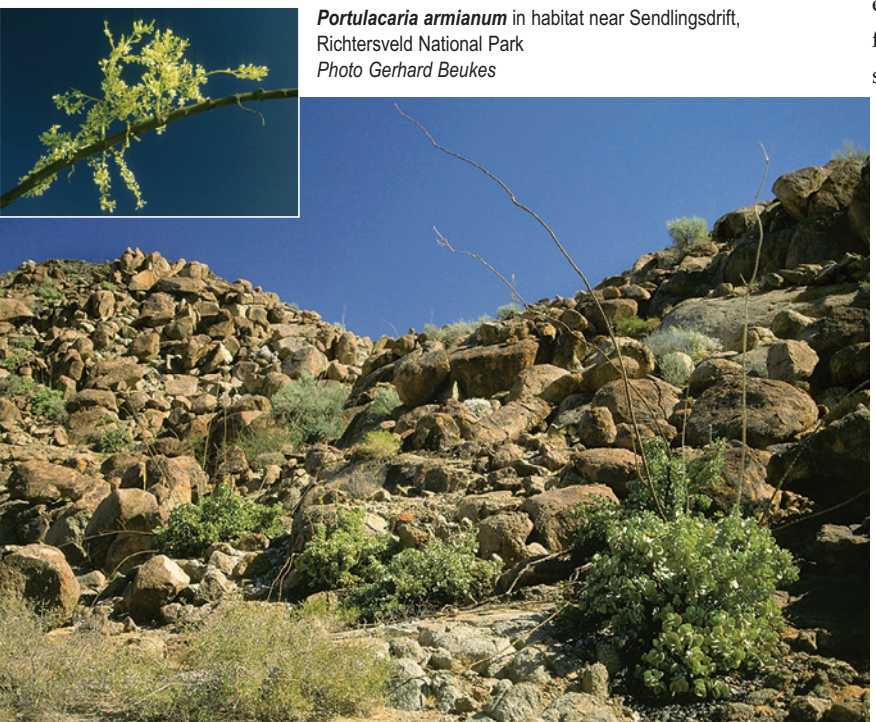
PORTULACARIA Jacq.

This is a shrubby species with two species. The fleshy stems and branches are covered with small fleshy obovate and sessile leaves.

PORTULACARIA AFRA **H. Pearson** This species is grey-green and grows up to about 5 m tall, with nearly horizontal segmented spreading and cylindrical branches. The small obovate fleshy leaves are opposite and sessile. They are shiny-green. The flowers are tiny, inconspicuous and pink but are a spectacular sight in their abundance. Known as the 'Pork Bush' this species is a valuable livestock food and is a very dominant species in parts of the E Cape.

Distribution: Occurs from the E Little Karoo, through the E Cape and N into Swaziland and Mpumalanga. Plants are found in S Mozambique but may have been introduced.

PORTULACARIA ARMIANUM **Van Jaarsveld** This is a branched and spreading shrub growing up to nearly 1 m. and a diameter of < 1 m. The stem and branches are covered with a papery peeling bark. The curious leaves are ovate to obovate, with a rounded apex. The erect inflorescences are very long, up to 5 m tall and sparingly branched and has fascicles of small white to yellow inconspicuous flowers.



Portulacaria armianum in habitat near Sendlingsdrift, Richtersveld National Park
Photo Gerhard Beukes

Distribution: Of limited distribution on the Namibian side of the Orange River on the mountains opposite the extreme northern bend of the river.

BOMBACACEAE Kunth

The Bombacaceae family is a large tree family of some 30 genera worldwide. Some are massive with trunks of huge girth and great height, of which the African baobab is the best example, and certainly the largest. Most cannot, however, be regarded as succulents.

ADANSONIA L.

The succulent genus *Adansonia*, better known as 'Baobab Trees' consists of 9 species, two in Africa: *A. digitata* and *A. kilima*, newly described from East Africa, N Botswana, S Zambia and N Namibia, five in Madagascar and one in Australia. Of these, the African species, *A. digitata*, is by far the most massive, but not the tallest. This distinction belongs to the Madagascar species, some of which can reach up to in excess of 30 m tall. *A. digitata* is rarely taller than 20 m, but the girth and bulk of the stem is phenomenal.

ADANSONIA DIGITATA **L.** The famous African baobab is an inhabitant of the more arid parts of sub-Saharan Africa. Because of its value for a number of reasons, it has probably been spread by human activity to many parts of the continent where it is not indigenous. This is a grossly fat, rather short tree, the trunk of which can exceed 28 m in circumference. Some of the massive specimens have been estimated to have lived well in excess of 2000 years. They are frost sensitive. So large are the trucks sometimes that hollow specimens have served on occasion as houses, prisons, storage facilities, bus stops and even a liquor bar. The trunk is pinkish, reddish-brown or coppery, the bark is smooth. The leaves are 5- to 9-foliate on mature trees. The flowers are pendant, large - up to 20 cm in diameter, waxy-white to yellowish and the fruit is incased in a hard, ovoid, woody shell up to 12 cm or longer. The seeds are incased in a soft, powdery, edible pulp which is rich in ascorbic acid.

Distribution: along the N border of Namibia, across N Botswana and the Northern Province of South Africa and as far south as the Olifants River in the Kruger National Park. Outside southern Africa it occurs in Angola, and along the eastern parts of the continent as far as southern Sudan.



Niels Jacobsen



Priscilla Burgoyne SANBI

1 - 4. ***Protulacaria afra*** (1) in habitat near Graaff-Reinet
(2) Detail of flowers from Ecca Pass, NE of Grahamstown
(3 & 4) In habitat near Uitenhage, E Cape
5 & 6 *Adansonia digitata* with opened flower, in habitat at Pafuri, Kruger National Park



Priscilla Burgoyne SANBI



Gerhard Beukes & inset

Priscilla Burgoyne SANBI





MORINGACEAE R. Br. ex Dumort

This monotypic family comprises about 14 species of which only one is found in this region. It is a cryptic succulent with a smooth swollen trunk but, particularly in open areas, it forms grotesque trunks. It is more common on hilly slopes but is also found on sandy flats.

Moringa ovalifolia **Dinter & A. Berger** This species is a cryptic succulent tree, growing up to about 6 m tall with a trunk which is swollen and smooth. However on some populations on the sandy plains, the trees develop grotesquely misshapen swollen trunks. The leaves are smallish, doubly-pinnate and green. The inflorescence is a panicle of small yellow flowers.

Distribution: Occurs on dry rocky hillsides and sandy plains across the N parts of Namibia.

Robin Frandsen



VITACEAE Juss.

The plants of this genus are of the grape family. The plants are mainly climbers and succulence is rare. The genus *Cyphostemma* does however boast some tree succulents of which three species are represented here, all from Namibia.

Cyphostemma (Planch.) Alston

The succulent arborescent genus discussed here was previously classified under *Cissus*. The species considered for inclusion here are those large to medium succulent deciduous species, inhabitants of the desert-like conditions of NW Namibia and S Angola. These slow-growing plants have thick trunks growing up to about 2.5 to 7 m tall. The trunks are smooth and sometimes clothed with papery bark.

Cyphostemma bainesii **(Hook.f.) Desc.** This succulent tree seldom exceeds 1 m in height. The trunk is globose or bottle-shaped often dividing into two thick, tapering branches which rebranch. The bark is yellowish-orange with a papery peel. The large fleshy bright-green to bluish-green leaves are on a short pedicel. They are lanceolate with coarse teeth and often have a reddish margin. The flowers are diminutive, soon falling. The fruits are produced in blackish grape-like clusters.

Distribution: Occurs between Windhoek and Walvis Bay in Namibia.

Cyphostemma currorii **(Hook.f.) Desc.** This thickset tree grows up to about 4—7 m in height. It has a uniformly straight trunk, sometimes with a bulbous base, which is yellowish to pale brown, smooth with a papery peeling

Gerhard Beukes





Judd Kirkel Welwitch



Judd Kirkel Welwitch



Judd Kirkel Welwitch

Judd Kirkel Welwitch



1 & 2. ***Moringa ovalifolia*** (1) in habitat at 'Sprokieswoud', Etosha National Park. (2 in habitat NW of Walvis Bay
3. ***Cyphostemma bainesii*** in habitat near Zaris, W of Marienthal, Namibia
4 - 7 ***Cyphostemma currorii*** (4 & inset) in habitat S of Sesfontein, NW Namibia
(5) in habitat at Spitzkoppe, N of Usakos, Namibia (6) Fruit from the plant (7) close-up of the leaves

Niels Jacobsen



bark. The leaves are trifoliate, broadly elliptic and are thick and fleshy. They are light-green and velvety to the touch when young. The flowers are small and yellowish-green. The red fruit is borne in clusters and is grape-like.

Distribution: Occurs in Namibia from Walvis Bay to Windhoek and northwards into Kaokoland and into Angola.

Cyphostemma juttae **(Dinter & Gilg.) Desc.** This is a short, thickset species usually not exceeding 2 m, only rarely up to 4 m. It divides into two or three thick branches. The bark is pale yellowish-green which peel into curled creamy papery flakes. The sessile leaves are simple when new and trifoliate when mature. They are coarsely serrate, shining green, sometimes reddish. The flowers are small greenish-cream. The grapelike fruit is red becoming purplish-black.

Distribution: From about Karibib in the S, N and NW in a broad band to about Etosha and then narrowly NW to the border and narrowly into Angola.

Cyphostemma uter **(Excell & Mendonça) Desc.** This is a dwarf species which is rarely more than 2 m tall. It spreads rather wide in relation to its height. The young plants are somewhat bottle-shaped and the bark is yellowish-white , smooth and horizontally grooved, flaking off in thin papery strips. The flowers are yellowish-green and the fruit is a red ovoid berry. All parts of this very attractive rather rare species are very poisonous.

Distribution: Occurs in a very limited area in the extreme NW of Namibia and narrowly, up to Mossamedes in Angola.

Gerhard Beukes



Judd Kirkel Welwitch





Judd Kirkel Welwitch & inset

Judd Kirkel Welwitch





1. ***Cyphostemma juttae*** in habitat near Tsumeb, N Namibia
2 - 4 & inset. ***Cyphostemma uter*** in habitat south of Sesfontein in NW Namibia

WELWITSCHIACEAE Markgr.

Welwitschia Hook.f.

***Welwitschia mirabilis* Hook.f.** This strange monotypic plant cannot not be strictly classed as a succulent plant. However its survival skills in the alien world of very arid desert does characterise it as a contrived succulent. It is generally classed as a link between angiosperms and gymnosperms. This grotesque plant, which in relationship, is closest to the conifers, despite its appearance, has only two sessile opposite leaves which grow continuously and are the only leaves produced in the lifetime of the plant. These long trailing leaves shred longitudinally into very many strips. The plants are dioecious. The flowers of the female plant are large and the male plants, smaller, these are borne on the outer grooves of the woody stem. Naked seeds are borne on female cones. There is some controversy as to whether the symbiotic relationship with a particular insect is the only form of pollination. Some accept that a small wasp and the wind are active pollinators. Some plants through carbon-dating, have been accurately aged as in excess of 1500 years. The plant rely on mists for its water and this is absorbed through opened stomata on the leaves. These stomata close when the air is dry.

Distribution: Occurs in Namibia from the Kuisib River in the S, and N to Cape Negro in Angola. Most plants are located within the fog belt, approximately 80 km from the coast





Welwitschia mirabilis formerly *W. bainesii*, in habitat.
(1) Male plant near Brandberg, (2) Male flowers from a plant from the Messum River, W of Brandberg, (3) Female plant near Brandberg, (4) Female cones from the Messum River. (5) Female cones showing one of its insect pollinaters. Eight pollinater flies have been identified.
Photos Gerhard Beukes


4


5


3

GLOSSARY

< : This symbol in the text is used to indicate that the measurement given is the usual maximum but may be exceeded

Abaxial: away from the axis cf **adaxial**
Acaulescent: stemless cf **caulescent**
Acinaciform: curved, scimitar-shaped
Acropetal: produced and developed in succession from the base upwards Acropetalous succession = Raceme
Acuminate: tapering from inwardly curved sides into a narrow point
Acute: sharply pointed
Adaxial: towards the axis cf **abaxial**
Adpressed appressed: not joined but closely pressed together
Adpressed-pilose: hairs closely pressed together cf **seriaceous**
Adventitious: applied to roots not rising from the radical but from other parts of the plants, usually the stem
Allopatric: geographically separated
Alveolate: Pitted with very small shallow depressions, smaller than those discribed as 'lacunate'
Amplexicaul: stem-clasping
Aniso-: unequal
Anisophyllus: unequal leaf pairs
Annual: a plant which completes its complete life cycle within one year
Annulus: refers to usually some stapeliad flowers which have a raised fleshy ring
Anthers: the pollen-containing part of the stamen
Anthesis: the full expansion of the flower
Apex the tip or point
Apiculate: tipped with a sharp point – apiculus – see 'mucronate'
Arborescent: Of the character or size of a tree
Arcuate: bent like a bow; arched
Aristate: with bearded awns spinous process; having a pointed spine-like point
Ascending: Upward directed, as a stem or pedicel, commencing obliquely then vertically
Asper: rough, sharp to the touch
Asperous/asperulous/asperate: rough surface, with short hairs or points
Attenuate:: tapered, slender, thin
Awn: Stiff, bristly process
Axis Axes - pl the main root, stem, branch or peduncle
Axil: the angle between the axis of the stem or branch and the process arising from it a leaf or bract
Axillary: produced in an axil

Biennial: the full life-cycle of a plant lasting two years, usually forming the vegetative part of the plant in the first year and flowering in the second
Bifid: divide into two parts
Bicampanulate: the second bell-shape formed by a corolla
Bisexual: flowers producing both stamens and pistil
Bract: a modified leaf associated with the inflorescence part of a plant
Bracteate: having bracts
Bracteoles: small bracts

Caducous: falling off very early
Caespitose: growth form is tufts or patches
Calyx: the outer envelope of a flower
Campanulate: bell-shaped
Canaliculate: channelled
Capitate: a head-forming inflorescence
Capsule: a dry, dehiscent fruit
Carinate: keeled
Carnose: fleshy in texture
Carpel: a simple pistil comprising an ovar.y, style and stigma, or an element of a compound pistil
Cartilaginous like cartilage: horny, tough but flexible especially leaf-edges
Carunculate: possessing warts or small processes
Caudex: stem of a plant
Caulescent: possessing as stem cf **acaulescent**
Ciliate: fringed with hairs or with hair-like outgrowths cf **eciliate**: without cilia
Circinnate: rolled inward from the apex into a coil
Clavate: club-shaped
Concave: having a curved surface as seen within the curve
Confluent: flowing together so as to blend into one
Connate: united
Connivent: coming together
Contiguous: in actual contact, adjacent
Contractile: the ability of a root-system to shorten and to withdraw the plant body into the soil

Convex: having a curved surface as seen from outside the curve
Cordate: heart-shaped; two equally rounded lobes at the base
Cordiform: said of a heart-shaped form
Coriaceous: leathery
Corolla: the inner envelope of a flower which usually surrounds the gynostaegium, or corona
Corona: a crown-shaped process of the Stapelieae comprised of usually inner and outer lobes
Corymbose: a raceme with the lower flower stalks longer than those above, so that the flowers are at the same level
Cremnophile: cliff-dweller
Crenate: scalloped or notched, with shallow round teeth cf **crenulate**, **dentate**, **serrate** See leaf-margins
Crenation: a rounded marginal tooth
Crenulate: minutely crenate, but with the teeth small cf **Crenate**, **dentate**, **serrate** See leaf-margins
Cultivar.: an unnatural plant derived from horticultural production as opposed to natural plants in the wild Sometimes incorrectly used to describe unnaturally coloured plants found in nature
Cuneate: wedge-shaped
Cupular: shaped like a little cup
Cuspidate: terminating is a sharp rigid point
Cyathium pl: cyathia In the Euphorbiaceae a compound flower head consisting normally of a single pistillate flower and/or 5 clusters each comprising several staminate flowers, contained in an involucre
Cylindric: shaped like a cylinder or uniform round column
Cyme: an inflorescence in which the lateral axis is more-strongly formed than the lateral axes In the Euphorbiaceae, a cluster of cyathia, the central axis short, terminating in a cyathium and increasing by lateral branching

Decumbent: reclining on the earth or base and rising at the apex
Decussate: in opposite pairs alternately crossing at right angles one to the other
Deflexed: Bent downwards abruptly
Deltate/Deltoid: triangular
Dentate: toothed
Denticle, **Denticulate**: minutely toothed
Dependant suspended, hanging down
Depressed: appearing to be flattened or pressed down from above
Diachasium Dichasia - pl: said of pedicels subdividing progressively from a common peduncle
Dioecious: male and female flowers are borne on separate plants cf **monoecious**
Dimorphic: having two distinct forms
Discrete: separate, not confluent
Disk: the united central part of the limb
Distally: away from the point of origin, as towards the apex of a stem
Divaricate: widely diverging
Dorsal: situated at the back

Echinulate: beset with small spines
Emarginate: having a notch at the apex
Endemic: restricted in locality to a particular locality or country
Entire: completely without marginal division
Erose: Irregularly notched or jagged as if gnawed
Excavate: hollowed out in a curve
Exserted: protruding
Extra-axillary: arising from a point other than an axil

Falcate: bent like a sickle
Fascicle: cluster
Fasciculate: forming fascicles
Fastigiate: with branches clustered together parallel and erect, giving a narrow elongated effect
ferruginous: rust-coloured
Fibritile: slender, threadlike
Filament: part of the stamen supporting the anther
Filiform: threadlike, very slended cf **fibritile**
Flaccid: soft through lack of firmness
Foliar: leaf-like
Follicle: seedpod of certain plants, such as of stapeliads
Fuscous: dusky-coloured, blackish-brown
Fusiform: spindle-shaped, tapering at both ends

Gamepetalous with petals united as with the flowers of the Asclepiadaceae and Apocynaceae
Geniculate: shaped like a bent knee
Gibbosity: a convex swelling
Gibbous: with a convex swelling on one side
Glabrescent: covered with fine hairs

Glabrous: without hairs
Gland: Secretory organ
Glaucescent: somewhat glaucous in appearance
Glaucous covered with a bloom; where referring to colour, dull green passing to greyish-blue
Globose spherical or nearly so
Glomerate: densely clustered

Herbaceous: having the characteristics of a herb – not woody
Hetero-: more than one kind of form
Heterophyllous: with more than one kind of leaf form
Hispidus/Hispidulous/Hispid: Covered with coarse rigid erect hairs or bristles harsh to the touch
Humifuse: spread out over the ground, procumbent Humus – the earth, the soil
Hyaline: thin and translucent
Hydothodes: a water-shedding gland found along the edges or tips of leaves of many plants

Idioblast: a supporting cell which lacks chlorophyll; or any cell that varies in content from the surrounding cells and is thicker-walled
Imbricate: when they overlap each other parallely at the margins, without any involution
Indumentum: hair covering
Internode: the stem between nodes
Involucre: A whorl of modified leaves or bracts surrounding flowers at the centre
Involute: rolled inwards
Isophyllous: equal leaf pairs

Lacunose: covered with pitted or shallow depressions Larger than those described as 'alveolate'
Lamina: Leaf blade
Lanate: woolly
Lenticular: lens-shaped
Ligulate: strap-shaped
Limb: outer part of the corolla as opposed to the tube especially in the flowers of the stapeliads
Lunate: crescent-shaped

Marcescent: withering without falling off
Monochasium Monochasia - pl a cyme where the branching is extended by a single lateral branch
Monoecious: both male and female flowers are borne on the same plant, cf **Dioecious**
Mucro: a short sharp point formed by the continuation of the midrib of a leaf
Mucronate: Refers to a leaf tipped with a sharp point of much the same texture

Nodding cf nutans: inclined very much from the perpendicular so that the apex is downward-pointing
Node: the part of the stem where the leaf or leaves emerge
Nominate subsp.ecies a subsp.ecies sharing the same name as its species
Nothospecies: a hybrid
Nutans cf nodding: inclined very much from the perpendicular so that the apex is downward-pointing

Ob: the prefix 'ob' refers to the reversal of the meaning of the word to which it is prefixed: eg ovate = broad at the base and narrow at the apex and the word obovate = narrow at the base and broad at the apex
Obconic: cone-shaped
Obcordate: inverted heart-shape
Oblanceolate: lanceolate, tapering, but towards the base
Obovate: oblong or elliptical, broadest at the upper end
Obsolete: disappearing; rudimentary, suppressed, scarcely
Orbiculate: perfectly circular
Ovate: oblong or elliptical, broadest at the lower end

Palmate: Having several lobes, segments etc spreading from the same point, like the fingers of a hand
Panicle: a branched raceme with each branch bearing a raceme of flowers
Pedicel: stalk of a single flower
Perennial: living more than 2 years
Petiole: stalk of a leaf or bract
Petiolate: furnished woith a petiole
Peduncle: The axis from where the flower pedicel arises, or the stalk of a flower, as the peduncle of a cyathium or a cyme
Pedunculate: furnished with a peduncle
Pellucid: translucent or transparent
Pectinate: comb-shaped
Phyllopodia*:* Persistent leaf bases, sometimes present in the Crassulaceae
Pilose: silvery, with long, straight closely adpressed glossy hairs

Pinnatifid: divided almost to the axis into lateral segments something in the way of the divisions of a feather
Prostrate: flat on the ground
Puberulous: covered with a minute down
Pyriforme: pear-shaped

Raceme: an inflorescence with the main axis bearing stalked flowers which are borne in acropetal succession
Replicate: folded back as in the lobes of duvalias
Revolute: rolled backwards from the direction ordinarily assumed by other similar bodies
Reflexed: bent abruptly backwards at more than 90°
Rhizome: a perennial underground stem
Rosulate: having a rosette
Rotate: wheel-shaped, in gamepetalous flowers: flattened or with a very short tube
Rugose: ridged or wrinkled
Rugulose: finely rugose

Sarmentose: like a running stem which arises as a small arch from the roots and then becoming prostrate
Scabrid/Scabrous: rough to the touch
Scandent: growing erect to sub-erect but dependent upon the support of other plants for its growth support
Scape: a flower stalk which is leafless, or nearly so, arising out of the centre of a rosette of leaves It bears a flower, several flowers or a crowded inflorescence
Sericeous: silky, with long straight closely pressed glossy hairs
Shields: relates to the horny growth from which the spines are produced, especially in the euphorbias
Spathulate: spoon-shaped, oblong or obovate at the apex with a long attenuate base
Stipules: paired scales spines or blade-like outgrowths found at the base of the petiole
Subulate: awl-shaped–tapering from a narrow or moderately broad base to a very fine point
Sulcate: marked with distinct longitudinal furrows

Terete: circular in cross-section, cylindric and tapering to a point
Tessellate: formed of small squares, having the appearance of the carapace of a tortoise
Thyrse: closely branched inflorescence with many short-stalked flowers
Trigonal trigonous: triangular in cross-section
Triquetrous: having three angles and three convex surfaces
Truncate: appearing to be cut off square at the apex
Tubercle: in a broad sense any knob-shaped prominence
Tuberculate: covered with tubercles
Tuberous: Resembling a tuber
Turbinate: Top-shaped

Umbel: a cluster of cyathia or flowers in which the stalks pedicels radiate from a common point
Undulate: wavy
Urceolate: urn-shaped

Ventral: pertaining to the front surface of an organ cf dorsal
Verrucose: covered with wart-like appendages
Verruculose: somewhat verrucose, slightly warty
Verticel: a whorl
Verticellate: arranged in a vertice, as when the branches are disposed in a circle around the main stem
Villous: covered with long fine soft hairs
Viscid: sticky or covered with a stick substance

Whorl: a circle of leaves, bracts, spines or other organs around a stem, branch or stalk
Woody: composed of ligneous fibre, like most trees and shrubs, and opposed to herbaceous

SELECTED REFERENCES

Bayer, MB Haworthia *Handbook* 1976

- *New* Haworthia *Handbook* 1983

- *Haworthia* Revisited 1999

- & Manning, J *A rationalization of names in Haworthia: a list of species with new combinations and new synonyms* Alsterworthia June *2012*

Bruyns, PV *A note on* Pleiospilos hilmari *Bol,* Aloe 23, No 2, 30, 1986

- *Stapeliads of Southern Africa,* Vol 1&2 2005

Burgoyne, Smith,F & Chesselet, P, Hammeria, *a new genus of Aizoceae from South Africa,* Cactus & Succulent Jl US 70, 4: 203-208 2002

Cole, DT, Trichocaulon - *the smooth-stemmed species*

- Lithops-*Flowering Stones* 1988

- Lithops-*Flowering Stones* 2005

Court, D *Succulent Flora of Southern Africa revised edition* 2000

Craib, Charles, G*rass Aloes of the South African Veld* 2005

- &, JJ, Lavranos, *The Bushman Candles* 2011

Daru, B H, Manning J C, James S. Boatwright, Maurin, O, Maclean, N, Schaefer, H, Kuzmina, M, van der Bank, M, *Molecular and morphological analysis of subfamily Alooideae (Asphodelaceae) and the inclusion of* Chortolirion *in* Aloe. Taxon 62 (1): 62-76, 2013

Dyer, R A Ceropegia, Brachystelma *and* Riocreuxia *in southern Africa* 1983

Frandsen, RMI Neohenricia sibbettii Aloe 23, No 3 60 1986

- Ceraria namaquensis *Sond H Pearson & Stephens* Aloe 36, No 1 1999

Fritz *More localities for* Khadia beswickii*, a red data mesem species from Heidelberg,auteng* Aloe 44, 1: 10-13 2008

Glen, HF *A revision of the Gibbaeinae Mesembryanthemaceae* Unpublished MSc thesis, University of Cape Town 1974

- & Hardy,DS, *Aloaceae First Part* Aloe, *Flora of southern Africa* **5** National Botanical Institute, Pretoria

Grace, O M & Rønsted, N, *Unlocking the secrets of DNA in the classification of aloes*. Aloe 50 (1&2): 22-23, 2013

Grace, O M, Klopper, R R, Smith, G F, Crouch, N R, Figueiredo, E, Rønsted, van Wyk, A E, *A revised generic classification for* Aloe (*Xanthorrhoeaceae subfam. Asphodeloideae*). Phytotaxa 76 (1): 7-14, 2013

Gunn, M and Codd,E *Botanical Exploration of Southern Africa* 1981

Hammer, S *The genus* Conophytum-*A Conograph* 1993

- *Dumpling and His Wife: New Views of the Genus* Conophytum 2002

- Lithops, *treasures of the veld* 1999

Hartmann, HEK *Illustrated Handbook of Succulent Plants-Aizoaceae,* 2 volumes 2001

Herre, H *The genera of the Mesembryanthemaceae* 1971

Jacobsen, H, *Lexicon of Succulent Plants* 1974

-*Lexicon of Succulent Plants* 3 Volumes 1977

Lavranos, JJ, *The rediscovery of* Stapeliopsis neronis Aloe 13: 75-77

Leach, Larry C *A Review of* Tridentea Excelsa, Taxonomic Series No 2 1980

- *A revision of* Stapelia Asclepiadaceae Excelsa Series No 3 1985

- *On the classification of Stapelieae and the reinstatement of* Tridentea Transactions of the Rhodesia Scientific Association, 59: 1-5 1978b

- *A review of* Tridentea. Excelsa, Taxonomic Series 2: 1-68 1980

- *A revision of* Tromotriche *Asclepiadaceae* Journal of South African Botany 50, 4: 549-562 1984b

- *A revision of* Stapelia. *Asclepiadaceae* Excelsa Taxonomic Series 3: 1-157 1958

- *A revision of* Huernia *Asclepiadaceae* Excelsa Taxonomic Series 4: 197 1988

Manning, J, Boatright, J S, Daru, B H, Maurin, O , van der Bank, M, *A Molecular Phylogeny and Generic Classification of Asphodelaceae subfamily Alooideae: A Final Resolution of the Prickly Issue of Polyphyly in the Alooids*? Systematic Botany 39(1): 55-74, 2014

Marx, Gerhard Euphorbia obesa *Hook fil,* Aloe 24, No 2 1987

Meve, Ulrich, *The genus* Piaranthus Asclepiadaceae Bradleya 12: 57–102 1994

Moffett, RO *The genus* Sarcocaulon Bothalia 12, 4: 581–613 1979

Nel GC Lithops 1953

—Gibbaeum *Handbook* 1953

Palgrave, Keith Coates, *Trees of Southern Africa*, Third edition 2002

Pettigrew, Jack D., *et al*. Adansonia kilima *sp. nov.,a diploid baobab from Africa* Taxon 61 (6), 1240-1250, December 2012

Plowes, DCH, Lavrania *A new stapeliad genus from South West Africa* Cactus & Succulent Journal US 58: 119-123

1986
-*The taxonomy of* Quaqua Excelsa 16: 83-102 1994
Retief, JR (Kotie,) *New developments in the world of Aloes* Aloe 50, 4: 2013
Reynolds, W., *Aloes of South Africa* 2nd edition 1969
- *Aloes of Tropical Africa and Madagascar* 1966
Rowley, GD, *Caudiciform & PachycaulmSucculents* 1984
- Anacampseros, Avonia, Grahamia *A Grower's Handbook* British Cactus and Succulent Society 1995
- . *Generic concepts in the Alooideae* 3: *The phylogenetic story*. Alsterworthia International Special Issue 10: 1-7, 2013
Sauer, N., *Notes on* Lapidaria margarethae Aloe 19, no 2, 37–38
Schwantes, *Flowering Stones and Midday Flowers* 1957
Scott, CL *The genus* Haworthia *a taxonomic revision* 1985
Smith G *et al, Mesembs of the World* 1998
Strawberry Press, *The* Euphorbia *Journal,* Vols 1-10 1981-1988
Tijmans, Wim J, *A Botanical Octopus:* Welwitchia mirabilis *Hook* Aloe 161, 11—18 1978
Tölken, HR, *A revision of the genus* Crassula *in Southern Africa* Contributions from the Herbarium 8, 1 & 2 1977
— *Crassulaceae*, Flora of Southern Africa, 14 1985
Van Jaarsveld, EJ, - Aloe dabenorisana '*n nuwe aalwyn uit die Boesmanland* Aloe 19, No 4, 101–103 1982
- Portulacaria armianum: *a new Portulacaria from southern Namibia* Journal of South African Botany 50, 3: 393-399 1984
- *The genus* Gasteria*, a synoptic review* Aloe 29, 1: 5-30 1992
- *Gasterias of South Africa* 1994
- *The genus* Gasteria*, a synoptic review* Aloe 44, 4: 82-102 2007
- & Koutnik, Cotyledon *and* Tylecodon Umdaus Press, 2004
- & Swanepoel, W, van Wyk, AE, &, JJ, Aloe pavelkae, *a new cliff-dwelling species of* Aloe *series 'Mitriformes' from southern Namibia* Aloe 44, 3: 75-79 2007
van der Walt, JJ, *Pelargoniums of southern Africa* Vols 1-3 1977, 1981 & 1988
van Wyk, B-E & Smith,ideon,*uide to the aloes of South Africa* Briza Publications 2003
van Wyk, B. *Taxonomy and natural history of Aloe: current knowledge and future prospects*. *Aloe* 50 (1&2): 14-21, 2013
White, A and Sloane, BL *The Stapelieae* 3 volumes 1937
White, A, Dyer, RA and Sloane, BL *The succulent Euphorbiaceae* Vols 1-2 1941
Williamson *The Succulent Euphorbia Species of the Richtersveld and Southern Namib Desert Sperrgebiet* The Euphorbia Journal, vol X 1996
— Euphorbia versicolores*, an attractive plant from the Richtersveld* Aloe 33, No 1, 1996
- *Richtersveld, the Enchanted Wilderness 2000*
Zonneveld, BJM and Fritz,PJ *Three species accepted in* Chortolirion Xanthorrhoeaceae: Asphodeloideae 2010

INDEX

Main sections and references are in **bold** print, Illustrations are in *italics.*

A

***ACRODON*, 304**
- ***bellidiflorus*, 304**, *305*
***ADANSONIA*, 468**
- ***digitata*, 468, 468**, *469*
- *kilima,* 468
***ADENIA*, xii, 252**
- ***fruticosa*, 252**, *253*
- ***glauca*, 252**, *253*
- ***pechuëlii*, 252**, 253, *454*
- ***spinosa*, 254**, *255*
***ADENIUM*, 116**, 258
- ***boehmianum*, 116**, *117*
- ***multiflorum*, 116**, *117*
- ***oleifolium*, *xvii,* 116**, *117*
- ***swazicum*, 118**, *119*
***ADROMISCHUS*, 426**
- ***alstonii*, 426**, *426*
- ***cristatus*, 426**, *427*
- ***filicaulis*, 426**, *427*
  subsp. *marlothii*, 426
- ***marianiae*, 426**, *427*
- ***montium-klinghardtii*, 428**, *429*
- *rupicola*, 428
- ***subdistachys*, 428**, *429*
- ***triflorus*, 428**, *429*
- ***trigynus*, 428**, *429*
- ***umbraticola*, 428**, *429*
***ALOE*, 2**
- ***aculeata*, 2**, *3*
- ***affinis*, 2**, *3*
- ***africana*, 2**, *3*
- ***albida*, 2**, *3*
- ***alooides*, 2**, *2*
- ***angelica*, 4**, *5*
- ***arborescens*, 4**, *5,* 38
- ***arenicola*, 4**, *4*
- ***asperifolia*, 4**, *5*, 38, 42
- *bainsii,*
- ***ballii*, 6**, *7*
- ***barbertoniae*, 6**, *7*
- ***bergeriana,* 6**, *7*
- ***bowiea*, 6**, *6*
- ***boylei*, 6**, *7,* 18
- ***branddraaiensis*, 8**, *9*
- ***brevifolia*, 8**, *9*
  var. ***depressa*, 8**, *9*
  var. ***postgenita*, 8**, *9*
- ***broomii*, 8**, *9,* 12
  var. ***tarkaensis*, 8**, *9*
- ***buhrii*, 8**, *9,* 28
- ***burgersfortensis*, 10**, *11*
- ***cameronii*, 10**, *11*
  var. ***bondonii***, *11*
- *candelabrum*, 20, *21*
- ***carnea*, 10**, *11*, 24
- ***castanea*, 10**, *11*
- ***chabaudii*, 12**, *13*
- ***challisii*, 12**, *13*
- ***chlorantha*, 12**, *13*
- ***chortoliriioides*, *xvi,* 12**, *13,* 58
- ***christianii*, 12**, *13*
- ***claviflora*, 4, 14**, *15*, 20
- ***comosa*, 14**, *15*
- ***comptonii*, 14**, *14*, *15,* 42
- ***cooperi*, 14**, *15*
- ***cryptopoda*, 16**, *17*, 34, 58
- ***dabenorisana*, 16**, *16*
- ***davyana*, 16**, *17*, 24, 60
- ***decurva*, 16**, *17*
- ***dewinteri*, 16**, *17*
- ***distans*, 18**, *19*
- ***dolomitica*, 18**, *19,* 58
- ***dominella*, 18**, *18*
- ***dumoulinii*, 18**, *19,* 28, 32
- ***ecklonis*, 18**, 19, *21*
- ***erinacea*, 20**, *21*
- ***excelsa* 20**, *21*
- ***falcata*, 14, 20**, *21*
- ***ferox*, 20**, *21*
- ***fosteri*, 22**, *23*
- ***fouriei*, 22**, *23*
- ***framesii*, 22**, *23,* 28
- ***gariepensis*, 22**, *23*
- ***gerstneri*, 22**, *23*
- ***glauca*, 22**, *22*
- ***globuligemma*, 24**, *25*
- ***graciliflora*, 24**, *25*
- ***grandidentata*, 24**, *25*
- ***greatheadii*, 10, 16, 24**, *25*, 26
- ***hazeliana*, 24**, *25*
- ***hereroensis*, 26**, *26, 27*
- *hlangapies*, 18
- ***howmannii*, 26**, *26*
- ***humilis*, 26**, *27*
- ***immaculata*, 26**, *27*
- ***inconspicua*, 28**, *29*
- ***integra*, 28**, *29*
- ***inyangensis*, 28**, *29*, 38
- ***jeppeae,* 28**, *28, 29*
- ***karasbergensis*, 28**, *29*, 52
- ***khamiesensis*, 30**, *31*
- ***kniphofioides*, 30**, *30*
- ***komaggensis*, 30**, *31, 52*
- ***kouebokkeveldensis*, 30**, *31*
- ***krapohliana*, 18, 30**, *31*
- *kraussii*, 18
- ***linearifolia*, 32**, *32*
- ***lineata*, 32**, *33*
  var. ***muirii*, 32**, *33*
- ***littoralis*, 32**, *33*
- ***longibracteata*, 32**, *33*
- ***longistyla*, 34**, *35*
- ***lutescens*, 34**, *34*
- ***maculata* 34**, *35*
- ***marlothii,* 2, 34**, *34*, 35, 50
- ***melanacantha*, 20, 36**, *37*
- ***meyeri*, 36**, *36*
- ***micrantha*, 36**, *37*
- ***microstigma*, 36**, *37*
- ***minima*, 36**, *37*, 42
- *mitriformis,* 42
- ***modesta*, 38**, *38*
- ***mudenensis*, 38**, *39*
- ***munchii*, 38**, *39*
- ***musapana*, 38**, *39*
- ***mutabilis*, 38**, *39*
- ***myriacantha*, 40**, *41*
- ***namibensis*, 40**, *41*

- ***nubigena***, **40**, *41*
- ***omavandae***, **40**, *41*
- ***ortholopha***, **40**, *40*
- ***pachygaster***, **42**, *43*
- ***parvibracteata***, **42**, *43*
- ***parviflora***, **42**, *43*
- ***pearsonii***, **42**, *43*
- ***peglerae***, **42**, *43*, 46
- ***perfoliata***, **42**, *42, 43*
- ***petricola***, **44**, *45*
- ***pictifolia***, **44**, *45*
- *plicatilis*, 66
- ***plowesii***, **44**, *44*
- ***pluridens***, **44**, *45*
- ***polyphylla***, **44**, *45*
- ***pratensis***, **46**, *47*
- ***pretoriensis***, 12, **46**, *47*
- ***prinslooi***, **46**, *46*
- ***pruinosa***, **46**, *46*
- *recurvifolia*, 2
- ***reitzii***, **48**, *49*
- ***reynoldsii***, **48**, *48*, 52
- ***rhodesiana***, **48**, *48*
- ***rupestris***, 20, **48**, *49*
- ***saponaria***, 34, **48**, *49*
  var. ***ficksburgensis***, **48**, 49
- ***saundersiae***, 2, **50**, *50*
- *sessiliflora*, 18
- ***speciosa***, **50**, *51*
- ***spectabilis***, 34, **52**, *53*
- ***spicata***, **50**, *51*
- ***striata***, 28, **52**, *53*
- ***succotrina***, **52**, *52*
- ***suffulta***, **52**, *53*
- ***suprafoliata***, **52**, *53*
- ***swynnertonii***, **54**, *55*
- ***tauri***, **54**, *54*
- ***thompsoniae***, **54**, *55*
- ***thorncroftii***, **54**, *55*
- ***thraskii***, **54**, *55*
- ***vanbalenii***, **56**, *57*
- *vera*, 2
- ***verdoorniae***, **56**, *57*
- ***verecunda***, **56**, *56*
- ***viridiflora***, **56**, *57*
- ***vogtsii***, **56**, *57*
- ***vossii***, **56**, *57*
- ***vryheidensis***, 18, **58**, *59*
- ***welwitschii***, 6, 28, **58**, *59*
- ***wickensii***, **58**, *59*
- ***wooliana***, **58**, *59*
- ***zebrina***, **60**, *61*

ALOIAMPILOS, **60**
- ***ciliaris***, **60**, *60*
- ***commixta***, **60**, *60*
- ***decumbens***, **60**, 60
- ***gracilis***, **60**, *60*
- ***striatula***, **62**, *63*
- ***tenuior***, **62**, *62*

ALOIDENDRON, **62**
- ***barberae***, **62**, 63
- ***dichotomum***, **62**, *63*, 64
- ***ramosissima*** **64**, *65*
- ***pillansii***, *62*, **64**, *65*

ALOINOPSIS, **304**, 358,
- ***acuta***, **304**, *305*
- ***loganii***, **304**, *305*
- ***luckhoffii***, **306**, *307*
- ***malherbei***, **306**, *307*
- *orpenii*, 304, 414
- ***rosulata***, **306**, *306*
- ***rubrolineata***, 306, **306**, *306*
- ***schooneesii***, **306**, *307*
- *setifera*, 306
- ***spathulata***, **306**, *307*

ANACAMPSEROS, **460**, 460
- ***albidiflora***, **460**, *461*
- ***arachnoides***, **460**, *460*
- ***baeseckei***, 436, **462**, *463*
- ***decapitata***, **462**, *463*
- ***filamentosa***, 460, **462**, *463*
  subsp. ***namaquensis***, **462**, *463*
- ***lanceolata***, **462**, *463*
- ***marlothii***, **462**, *463*
- ***retusa***, **462**, *463*
- ***rufescens***, **462**, *462*
- ***subnuda***, **464**, *464*
- ***telephiastrum***, 462, **464**, *465*

ANGOLLUMA, **124**
- ***lugardii***, **124**, *125*
- ***miscella***, **124**, *125*
- ***rogersii***, **124**, *125*
- ***schweinfurthii***, **124**, *125*
- ***ubomboensis***, **126**, *127*

ANTEGIBBAEUM, *305*, **308**
- ***fissoides***, **308**, *308*, 310

ANTIMIMA, **308**
- ***evoluta***, **308**, *309*
- ***ivori***, **308**, *309*
- ***lawsonii***, **308**, *309*
- ***pumila***, **308**, *309*
- ***pygmaea***, **310**, *311*

APTENIA, **310**
- ***cordifolia***, **310**, *311*

ARGYRODERMA, xiv, **310**, *305*, 314, 320, 358, 410
- ***congregatum***, **310**, *310*
- ***crateriforme***, **310**, *311*
- ***delaetii*** 310, **312**, *313*
- ***fissum*** 308, 310, **312**, *312*, 314
- ***framesii*** **312**, *313*
  var. ***hallii***, **312**, *313*
- ***patens*** **312**, *313*
- ***pearsonii***, **312**, *313*, 314
- ***subalbum***, *305*, 310, **314**, *315*
- ***testiculare*** **314**, *315*
- ***theartii*** **314**, *315*

ARISTALOE, **64**
- ***aristata***, **64**, *65*

ASCLEPIADACEAE, **108**
ASPHODELACEAE, **2**
ASTERACEAE, **120**
ASTROLOBA, **66**
- ***bullulata***, **66**, *67*
- ***congesta***, **66**, *67*
- ***corrugata***, 66, **67**
- ***foliolosa***, 66, **68**, *69*
- ***herrei***, **68**, *69*
- ***rubriflora***, **68**, *69*
- ***spiralis***, **68**, *69*

AUSTRALLUMA, **124**
- ***peschii***, **126**, *127*

AVONIA, 460, **464**

- ***albissima,*** 460, **464**
- ***papyraceae ,*** 460, **464**
  subsp. ***namaensis,*** 460, **464**
- ***quinaria,*** **466**, *467*
  subsp. ***alstonii*, 466**, *467*
- ***recurvata,*** **466**, *467*
- ***rhodesica,*** **466**, *467*
- ***ustulata,*** **466**, *467*

B

Baobab, African, 468
***BAYNESIA*, 126**
- ***lophophora*, 126**, *127,* 210
***BERGERANTHUS*, 314**, 318
- ***concavus*, 314**, *315*
- *leightonii*, 314
- ***multiceps*, 314**, *315*
Berrisfordia khamiesbergensis, 340
***BIJLIA*, 314**
- *cana*, 316
- ***dilitata***, 314, **316**, *317*
- ***tugwelliae***, 314, **316**, *317*
BOMBACACEAE, 468
Botterboom, 456
- *Bowiea africana,* 6
***BRACHYSTELMA*, 226**
- ***barberae*, 226**, *227*
- ***campanulatum*, 228**, *229*
- ***chlorozonum*, 228**, *229*
- ***circinatum*, 228**, *229*
- ***coddii*, 228**, *229*
- ***dinteri*, 228**, *229*
- ***foetidum*, 228**, *228*
- ***gerrardii*, 230**, *231*
- ***gracile*, 230**, *231*
- ***meyerianum*, 230**, *231*
- ***modestum*, 230**, *231*
- ***pygmaeum*, 230**, *231*
  subsp. ***flavidum,* 230**, *231*
- ***remotum*, 232**, *233*
- ***tuberosum*, 232**, *233*, 226
- ***vahrmeijeri*, 232**, *233*
***BRAUNSIA*, 316**
- ***maximiliani*, 316**, *317*
- ***vanrensburgii*, 316**, *317*
***BULBINE*, 68**
- ***mesembryanthoides*, 68**, *69*
Bushman's Candles, 230

C

Cannon aloe, 14
Caralluma, 126, 198, 226
CARPOBROTUS, x, **316**
-acinaciformis, 316
- ***deliciosus***, 316, **316**, *317*
- ***edulis***, 316, **318**, *319*
- ***mellei*, 318**, *319*
***CARRUANTHUS*, 318**
- *caninus*, 318
- ***peersii*, 318**, *319*
- ***ringens*, 318**, *319*
***CEPHALOPHYLLUM*, 302**
- ***griseum*, 318**, *319*
- ***pillansii*, 318**, *319*
- ***spissum*, 320**, *321*
- *spongiosum*, 380
- ***staminodiosum*, 304**, *305*
- ***tricolorum,* 304**, *305*
CERARIA, 460, **466**
- ***fruticulosa*, 466**, *467*
- ***namaquensis*, 466**, *467*
***CEROCHLAMYS*, 420**
- ***gemina*, 420**, *421*
- ***pachyphylla*, 420**, *421*
***CEROPEGIA*, 232**, 226
- ***africana*, 232**, *233*, 226
- ***ampliata*, 232**, *233*
- ***arenaria*, 232**, *233*
- ***barkleyi*, 234**, *235*
- ***cancellata*, 234**, *235*
- ***carnosa*, 234**, *235*
- ***cimiciodora*, 234**, *235*
- ***conrathii*, 234**, *235*
- ***crassifolia*, 234**, *235*
- *distincta,* 236
- ***haygarthii*, 236**, *237*
- ***linearis*, 236**, *237*
  subsp. ***woodii*, 236**, *237*
- ***multiflora*, 236**, *237*
- ***nilotica*, 236**, *237*
- ***occulta*, 236**, *237*
- ***racemosa*, 238**, *239*
  subsp. ***setifera*, 238**, *239*
- ***radicans*, 238**, *239*
- ***remotum*, 238**, *239*
- ***rendallii*, 238**, *239*
- ***sandersonii*, 238**, *239*
- ***stapeliiformis*, 238**, *239*
  subsp. ***serpentina*, 238**, *239*
- ***zeyheri*, 240**, *241*
***CHASMATOPHYLLUM*, 320**
- ***musculinum*, 320**, *321*
- ***stanleyi*, 320**, *321*
***CHEIRIDOPSIS*, 322**, 378
- ***acuminata*, 322**, *323*
- ***brownii*, 322**, *323*
- ***carol-schmidtii*, 322**, 322
- *cigarettafera,* 324
- ***denticulata*, 322**, *323*
- ***herrei*, 322**, *323*
- ***meyeri*, 322**, *323*
- ***namaquensis*, 334**, *325*
- ***peculiaris***, xi, 322, **334**, *325*
- ***pillansii*, 334**, *234*
- ***robusta***, 322, **334**, *325*
- ***velox*, 334**, *325*
- ***verrucosa*, 334**, *325*
Chortolirion bergeriana, 6
- *C. angolensis,* 28
Cissus, 470
Cleratum, 362
***CONICOSIA* 326**
- ***elongata,* 326**, *327*
- ***pugioniformis*, 326**, *327*
  subsp. *alboresea*, 326
  subsp. *muirii*, 326
CONOPHYTUM, xiv, 322, **326,** 384
- ***achabense*, 326**, *327*, 332
- ***acutum*, 328**, *329*
- ***albiflorum*, 328**, *329*
- ***angelicae*, 328**, *329*
- ***armianum*, 328**, *329*
- ***arthurolfago*, 328**, *329*

- *auriflorum*, **328**, *329*
subsp. *turbiniforme*, **328**, *329*
- *bilobum*, 330, **330**, *331*, 331
var. *altum*, **330**, *331*
var. *claviferens*, **330**, *331*
var. *elishae*, **330**, *331*
var. *gracilistylum*, **330**, *331*
var. *linearilucidum*, **330**, *331*
var. *muscosipapillatum*, **330**, *331*
- *blandum*, **330**, *331*
- *breve*, **330**, *331*
- *brunneum*, **330**, *331*
- *burgeri*, 326, **330**, *331*
- *calculus*, 330, **330**, *330*
subsp. *vanzijlii*, **330**, *330*
- *carpianum*, **332**, *333*
- *chauviniae*, **332**, *333*
- *chrisocruxum*, **332**, *333*
- *chrisolum*, **332**, *333*
- *comptonii*, **332**, *333*
- *concavum*, **334**, *335*
- *depressum*, **334**, *335*
subsp. *perdurans*, **334**, *335*
- *devium*, 326, 332, **334**, *334*
- *ectypum*, **334**, *335*
subsp. *brownii*, **334**, *335*
subsp. *cruciatum*, **334**, *335*
subsp. *sulcatum*, **334**, *335*
- *ernstii*, **334**, *335*
subsp. *cerebellum*, **334**, *335*
- *ficiforme*, **336**, *336*
- *flavum*, **336**, *337*
- *friedrichiae*, **336**, *337*
- *frutescens*, **336**, *337*
- *fulleri*, **336**, *337*
- *globosum* **336**, *337*
- *herreanthus*, **338**, *339*
subsp. *rex*, **338**, *339*
- *hians*, **338**, *339*
- *joubertii*, **338**, *338*
- *jucundum* **338**, *339*
subsp. *fragile*, **338**, *339*
subsp. *marlothii*, **338**, *339*
subsp. *ruschii*, **338**, *339*
- *khamiesbergense*, **340**, *340*
- *limpidum*, *311*, **340**, *341*
- *lithopsoides*, **340**, *341*
- *loeschianum*, **340**, *341*
- *luckhoffii*, **340**, *341*
- *marginatum*, **342**, *342*
subsp. *haramoepense*, **342**, *343*
subsp. *littlewoodii*, **342**, *343*
- *meyeri*, **342**, *342*
- *minimum*, **342**, *343*
- *minisculum* **342**, *343*
subsp. *aestiflorens*, **342**, *343*
subsp. *leipoldtii*, **342**, *343*
- *minutum*, **344**, *344*
subsp. *pearsonii*, **344**, *344*
- *obcordellum*, **344**, *319*
var. *ceresianum 'stayneri'*, **344**, *345*
subsp. *obcordellum* **var**. *ceresianum*, **344**, *345*
subsp. *obcordellum 'declinatum'*, **344**, *345*
subsp. *obcordellum 'picturatum'*, **344**, *345*
subsp. *obcordellum 'spectabile'*, **344**, *345*
subsp. *obcordellum ursprungianum'*, **344**, *345*
subsp. *rolfii*, **344**, *345*
subsp. *stenandrum*, **344**, *345*
- *obscurum*, **346**, *347*
subsp. *barbatum*, **346**, *347*
subsp. *sponsaliorum*, **346**, *347*
subsp. *vitreopapillum*, **346**, *347*
- *pageae*, *330*, **346**, *347*
- *pellucidum*, *305*, **346**, *347*
subsp. *neohallii*, **346**, *347*
subsp. *terricolor*, 346, **346**, *347*
- *phoenecium*, **348**, *349*
- *regale*, **350**, *351*
- *roodiae*, **350**, *351*
- *saxetanum* *311*, **350**, *351*
- *schlecteri*, **350**, *351*
- *smorenskaduense*, **350**, *351*
- *stephanii*, **350**, *351*, *439*
subsp. *helmutii*, **350**, *351*
- *subfenestratum*, **352**, *353*
- *swanepoelianum*, **352**, *353*
subsp. *proliferans*, **352**, *353*
subsp. *rubrolineatum*, **352**, *353*
- *tantillum*, **352**, *353*
subsp. *eenkokerense*, **352**, *353*
subsp. *heleniae*, **352**, *353*
subsp. *inexpectatum*, **352**, *353*
subsp. *lindenianum*, **352**, *353*
- *taylorianum*, 353, **353**
subsp. *ernianum*, **353**, *353*
subsp. *rosynense*, **353**, *353*
- *truncatum*, **354**, *355*
subsp. *viridicatum*, **354**, *355*
subsp. *wiggettiae*, **354**, *355*
- *turrigerum*, **354**, *355*
- *uviforme*, **354**, *355*
subsp. *decoratum*, **354**, *355*
subsp. *rauhii*, **354**, *355*
- *vanheerdei*, **354**, *354*
- *velutinum*, **356**, *357*
- *verrucosum*, **356**, *356*
- *violaciflorum*, **356**, *356*
- *wettsteinii*, **356**, *357*
COTYLEDON, 426, **428**, 454
- *adscendens*, **428**, *429*
- *barbeyi*, **428**, *429*
- *campanulata*, **428**, *428*
- *orbiculata*, **428**, *429*
var. *dactylopsis*, **428**, *429*
var. *flanaganii*, **428**, *429*
var. *oblonga*, **428**, *429*
var. *spuria*, **428**, *429*
- *papillaris*, 430
- *woodii*, **428**, *429*, 430
CRASSULACEAE, **426**
CRASSULA, 428, **432**
- *acinaciformis*, **432**, *433*
- *alba*, **432**, *433*, 436
var. *pallida*, 432
var. *parvisepela*, **432**, *433*
- *alpestris*, **432**, *433*
- *alstonii*, **432**, *433*
- *aphylla*, **432**, *433*
- *arborescens*, **432**, *433*
subsp. *undulatifolia*, **432**, *433*

- ***atropurpurea***, **434**, *435*
- ***barbata***, **434**, *435*
- ***barklyi***, **434**, *435*, 436
- ***biplanata***, **434**, *435*
- ***brevifolia***, **434**, *435*
- ***capitella***, **434**
  subsp. ***nodulosa***, **434**, *435*
  subsp. ***thyrsiflora***, **434**, *435*
- ***coccinea***, **434**, *435*
- ***columnaris***, 434, **436**, *437*, 446
  subsp. ***prolifera***, **436**, *437*
- ***congesta***, **436**, *437*
  subsp. ***laticephela***, **436**, *437*
- ***corallina***, **436**, *437*, 408
  subsp. ***macrorrhiza***, **436**, *437*
- ***cordata***, **436**, *437*
- *cornuta*, 438
- ***cotyledonis***, **436**, *437*
- ***deceptor***, **438**, *438*
- ***dejecta***, **438**, *439*
- ***deltoidea***, **438**, *439*
- ***dependens***, **438**, *439*
- ***dichotoma***, **438**, *439*
- ***elegans***, **438**, *439*
  subsp. ***namibensis***, **438**, *439*
- ***ericoides***, **440**, *441*
- ***exilis***, **440**, *441*
- ***expansa***, **440**, *441*
  subsp. ***filicaulis***, **440**, *441*
  subsp. ***fragilis***, **440**, *441*
  subsp. ***pyrifolia***, **440**, *441*
- *falcata*, 446
- ***garibina***, **440**, *441*
- ***grisea***, **440**, *441*
- ***hemisphaerica***, **440**, *441*
- ***hirtipes***, **442**, *443*
- ***lactea***, **442**, *443*
- ***lanuginosa***, **442**, *443*
- *lycopodoides*, 444
- ***macowaniana***, **442**, *443*
- ***mesembryanthemopsis***, **442**, *443*
- ***mesembryanthoides*** D Dietr, **442**, *443*
  subsp. ***hispida***, **442**, *443*
- ***multicava***, **442**, *442*
- ***muscosa***, 444, **444**, *445*, 448
- ***namaquensis***, **444**, *445*
  subsp. ***comptonii***, **444**, *445*
  subsp. ***lutea***, **444**, *445*
- ***natalensis***, **444**, *445*
- ***natans***, 432, **444**, *445*
- ***nudicaulis***, **444**, *445*
  var. ***herrei***, **428**, *429*
  var. ***platyphylla***, **444**, *445*
- ***orbicularis***, **446**, *447*
- ***pellucida***, **446**, *447*
  subsp. ***alsinoides***, **446**, *447*
  subsp. ***marginalis***, **446**, *447*
- ***perfoliata***, **446**, *447*
  var. ***coccinea***, **446**, *447*
  var. ***minor***, **446**, *447*
- ***plegmatoides***, **446**, *446*, *455*
- ***pseudohemisphaerica***, **448**, *449*
- ***pyramidalis***, 432, **448**, *449*
- ***rubricaulis***, **448**, *449*
- ***rupestris***, **448**, *449*
  subsp. ***marnierana***, **448**
- ***sericea***, **450**, *451*
  var. ***hottentotta***, **450**, *451*
  var. ***velutina***, **450**, *451*
- ***setulosa***, **450**, *451*
  var. ***jenkinsii***, *451*
- ***sladenii***, **450**, *451*
- ***susannae***, **450**, *451*
- ***swaziensis***, **450**, *451*
- ***tecta***, **434**, *434*
- *teres*, 434
- ***tetragona***, **452**, *453*
  subsp. ***connivens***, **452**, *453*
  subsp. ***robusta***, **452**, *453*
- ***tomentosa***, **452**, *453*
- ***umbella***, **452**, *453*
- ***vaginata***, **452**, *453*

CYLINDROPHYLLUM, **356**
- ***comptonii***, **356**, *357*
- ***hallii***, **356**, *357*
- ***tugwelliae***, **356**, *357*

CYPHOSTEMMA, **470**
- ***bainesii*** Desc, **470**, *470*, *471*
- ***currorii*** Desc, **470**, *471*
- ***juttae***, **472**, *473*
- ***uter***, **472**, *472*, *473*

D

DACTYLOPSIS, **368**, 412
- ***digitata***, **358**, *359*
- ***littlewoodii***, **358**, *359*

DEILANTHE, **358**
- ***peersii***, **358**, *359*

DELOSPERMA, x, **358**
- ***echinatum***, **358**, *358*
- ***lootsbergense***, **360**, *361*
- ***spalmanthoides***, **360**, *361*

DIDYMAOTUS, xiv, **360**
- ***lapidiformis***, **360**, *361*, 382, 386

DINTERANTHUS, xiv, xv, **360**, *361*, 382
- ***inexpectatus***, **360**, *361*
- ***microspermus***, **360**, *361*
- ***pole-evansii*** **360**, *361*
- ***puberulus***, **360**, *361*
- ***vanzijlii***, **362**, *363*, 384
- ***wilmotianus***, **362**, *362*, 382

DIOSCOREACEAE, **254**

DIOSCOREA, xii, **254**
- ***elephantipes***, **254**, *255*
- ***sylvatica*** Eckl, **254**, *255*

DIPLOSOMA, *305*, **362**
- ***luckhoffii***, **362**, *363*
- ***retroversum***, **362**, *363*

DOROTHEANTHUS, 362
- ***bellidiformis***, **364**, *365*
- ***booysenii***, **364**, *364*
- ***clavatus***, **364**, *365*
- ***maughanii***, **364**, *365*
- ***rourkeii***, **364**, *365*

DRACOPHILUS, **364**, 406
- ***dealbatus***, **364**, *365*
- *montis-draconis*, 364
- *proximus*, 364

Dracaena sp, xii

Dragon Tree, xii

DUVALIA, **126**, 226
- ***angustiloba***, **126**, *127*
- ***caespitosa***, **128**, *129*, 130, 132
  subsp. ***compacta***, **128**, *129*
- ***corderoyi***, **128**, *129*
- ***elegans***, **128**, *129*

- *gracilis*, **128**, *129*
- *immaculata*, **128**, *129*
- *maculata*, **130**, *131*
- *modesta*, **130**, *131*
- *parviflora*, **130**, *131*
- *pillansii*, **130**, *131*
- *polita*, **130**, *131*
- *pubescens*, **130**, *131*, 132
- *vestita*, **132**, *133*

E

***EBRACTEOLA*, 364**
- *fulleri*, **366**, *367*
- *montis-moltkei*, **366**, *367*
- *wilmaniae*, **366**, *367*

Echidnopsis, 168
Elephant's Foot *Dioscorea elephantipes*, xii, 254
EUPHORBIACEAE, 254
***EUPHORBIA*, 254**, 255, 302
- *aeruginosa*, **254**, *255*
- *aggregata*, **256**, *257*
- *albipollinifera*, **256**, *257*
- *avasmontana*, **256**, *257*
- *barnardii*, **256**, 256, *257*
- *bergerii*, **258**, *259*
- *braunsii*, **258**, *259*, 292
- *bupleurifolia*, **258**, *259*
- *burmannii*, **258**, *259*
- *caerulescens*, 260
- *caput-medusae*, **258**, *259*
- *chersina*, **258**, *258*
- *clandestina*, **260**, *261*
- *clavarioides*, **260**, *261*
  var. *truncata*, **260**, *261*
- *clivicola*, **260**, *261*
- *coerulescens*, **260**, *261*
- *colliculina*, **260**, *260*
- *confinalis*, **262**, *263*, 290
- *confluens*, **262**, *263*
- *cooperi*, **262**, *263*, 272
- *crassipes*, **262**, *263*, 268
- *crispa*, **262**, *262*, *263*
- *davyi*, **264**, *265*
- *decidua*, **264**, *265*
- *dregeana*, **264**, *265*
- *enoplaer*, **264**, *265*
- *enormis*, **264**, *265*
- *ephedroides*, **264**, *265*
- *esculenta*, **266**, *267*, 260, 276
- *eustacei*, **266**, *267*, 284
- *excelsa*, **266**, *267*
- *fasciculata*, **266**, *267*, 276, 292
- *ferox*, **266**, *267*
- *filiflora*, **268**, *269*
- *fusca*, 262, **268**, *269*
- *gamkaensis*, **268**, *269*
- *gariepina*, **268**, *269*
- *gatbergensis*, **268**, *268*
- *gentilis*, **268**, *269*
- *globosa* , **268**, *269*, 288, 296
- *gorgonis*, **268**, *269*
- *grandialata*, **270**, *270*
- *grandicornis*, **270**, *271*
- *grandidens*, **270**, *271*
- *graniticola*, **270**, *271*
- *gregaria*, **270**, *271*
- *griseola*, **272**, *273*
- *groenewaldii*, **272**, *273*, 296
- *gummifera*, **272**, *273*
- *halipedicola* **272**, *273*
- *hallii* **272**, *273*
- *hamata* Sweet, **272**, *273*
- *herrei*, 254, **274**, *275*
- *horrida*, 266, **274**, *275*
  var. *major*, **274**, *275*
  var. *noorsveldensis*, **274**, *274*
  var. *striata*, **274**, *275*
- *hottentota*, **274**, *275*
- *hypogeae*, **274**, *275*
- *inermis*, **276**, *277*
- *ingens*, 262, **276**, *277*
- *inornata*, **276**, *277*
- *jansenvillensis*, **276**, *277*
- *juglans*, **276**, *277*
- *juttae*, **278**, *279*
- *kaokoensis*, **262**, *263*
- *knobelii*, **278**, *279*, 268
- *leistneri*, **278**, *278*
- *lignosa*, **278**, *279*
- *limpopoana*, **278**, *279*
- *loricata*, **280**, *281*
- *louwii*, **280**, *281*
- *lydenburgensis*, **280**, *281*
- *mauritanica*, **280**, *281*
- *melanohydrata*, 254, **282**, *283*
- *meloformis*, **282**, *283*, 298
- *micrantha*, **282**, *282*
- *monteiroi*, 278, **282**, *283*, 300
  var. *brandbergensis*, **282**, *283*
- *multiceps*, **282**, *283*
- *multifolia*, 280, **284**, *285*
- *multiramosa*, xvii, **284**, *284*
- *namibensis*, **284**, *285*
- *nesemannii*, **284**, *284*
- *obesa*, **284**, *285*
  subsp. *symmetrica*, **284**, *285*
- *ornithopus*, **286**, *287*, 296
- *pentagona*, **286**, *286*
- *pentops*, **286**, *287*
- *perangusta*, **286**, *287*
- *pillansii*, *xix*, **286**, *287*
- *polycephala*, 268, **288**, *289*
- *polygona*, 280, **288**, *289*
- *pseudocactus*, **288**, *289*
- *pseudoglobosa*, **288**, *288*
- *pubiglans*, **288**, *289*
- *pugniformis*, **290**, *291*
- *pulvinata*, 256, **290**, *291*
- *ramiglans*, **290**, *291*
- *restituta*, 266, **290**, *291*
- *rowlandii*, **290**, *291*
- *rudis*, **290**, *290*
- *rugosiflora*, **292**, *293*
- *schinzii*, 254, **292**, *293*
- *schoenlandii*, **292**, *293*
- *sekukuniensis*, **292**, *293*
- *spinea*, **292**, *292*
- *squarrosa*, **294**, *295*
- *stapelioides*, **294**, *295*
- *stellata*, **294**, *295*
- *stellispina*, 286, **294**, *295*
- *susannae*, **294**, *294*, *375*
- *tetragona*, **296**, *297*

- ***tortirama*, 296**, *296*
- ***triangularis*, 296**, *297*
- ***trichadenia*, 296**, *297*
- ***tridentata*, 296**, *297*
- ***tuberculata***, 262, **298**, *299*
- *tuberosa*, 262
- ***umfoloziensis*, 298**, *299*
- ***valida*, 298**, *299*
- ***venenata*, 298**, *298*
- ***verruculosa***, 254, **298**, *299*
- ***versicolores*, 300**, *300*
- ***virosa*, 300**, *301*
- ***wildii* 300**, *301*
- ***wilmaniae*, 300**, *301*
- ***woodii*, 300**, *301*
- ***zoutpansbergensis*, 302**, *303*

F

FAUCARIA, xiv, **366**
- ***bosscheana*, 366**, *367*
- ***britteniae*, 366**, *367*
- *'candida'*, **366**, *367*
- ***felina*, 366**, *367*, 368
- ***tigrina***, 368, **368**, *369*
- ***tuberculosa*, 368**, *368*

FENESTRARIA, 368, **368**
- ***rhopalophylla*, 368**, *369*
  subsp. ***aurantiaca*, 368**, *369*

***FOCKEA*, 240**
- ***capensis***, 240, **240**, *241*
- ***edulis*, 240**, *241*

***FRITHIA*, 368**
- ***humilis*, 368**, *369*
- ***pulchra*, 370**, *371*

G

***GASTERIA*, 68**
- ***acinacifolia*, 68**, *68, 69*
- ***armstrongii*, 70**, *71*
- ***batesiana*, 70**, *71*
- ***baylissiana*, 70**, *71*
- ***bicolor*, 70**, *71*
- ***brachyphylla*, 70**, *71*
- ***carinata*, 72**, *73*, 76
- ***croucheri*, 72**, *73*
- ***disticha*, 72**, *73*
  var. ***verrucosa*, 72**, *73*
- ***doreeniae*, 72**, *73*
- ***ellaphieae*, 72**, *73*
- ***excelsa*, 74**, *74*
- ***glauca*, 74**, *75*
- ***glomerata*, 74**, *75*
- ***nitida*, 74**, *75*
- ***pillansii***, 68, 72, **74**, *75*
  var. ***ernesti-ruschii*, 74**, *75*
  var. ***hallii*, 74**, *75*
- ***polita*, 74**, *75*
- ***pulchra*, 74**, *75*
- ***rawlinsonii*, 76**, *77*
- ***retusa*, 76**, *77*
- ***thunbergii*, 76**, *77*
- ***tukhelensis*, 76**, *77*
- ***vlokii*, 76**, *77*

GERANIACEAE, 240

GIBBAEUM, xiv, 292, 308, **370**, 404
- ***album***, 289, **370**, *371*, *355*, 404
- ***angulipes*, 370**, *371*, 372
- *austricolum*, 372
- ***dispar***, 322, **370**, *371*
- ***esterhuyseniae*, 370**, *371*, 372
- ***geminum*, 370**, *371*
- ***gibbosum***, 354, **372**, *373*, 374
- *haagei*, 372
- ***haaglenii*, 372**, *373*
- ***heathii*** xix, **372**, *373*, 374
- *muirii*, *370*, 404
- ***nebrownii*, 372**, *372*
- *nuciforme*, 372, 374
- ***pachypodium***, 354, **372**, *373*
- ***petrense*, 374**, *375*, 388, 404
- ***pilosulum* 374**, *375*
  subsp. ***nuciforme*, 374**, *375*
- ***pubescens***, 354, **374**, 374, *375*
  subsp. ***shandii*, 374**, *375*
- *shandii*, 374
- ***velutinum***, 370, **374**, *375*

***GLOTTIPHYLLUM*, 374**
- ***depressum*, 376**, *377*
- ***difforme*, 376**, *377*
- ***fergusoniae*, 376**, *377*
- ***grandiflorum***, 376, **376**, *377*
- ***linguiforme*, 376**, *377*
- ***longum*, 376**, *377*
- ***nelii*, 376**, *377*
- ***oligocarpum*, 376**, *377*
- ***peersii*, 378**, *379*
- ***regium*, 378**, *379*
- ***suave*, 378**, *379*
- ***surrectum*, 378**, *379*

***GONIALOE*, ,64**
- **var*iegata*, *64***, 65

H

***HARTMANTHUS*, 378**
- ***pergamentaceus*, 378**, *379*

HAWORTHIA, xiv, 64, **76**

Haworthia, Sub-genus, **78, 106**
- ***angustifolia*, 78**, *79*
  var. ***altissima*, 78**, *79*
  var. ***baylisii*, 78**, *79*
  var. ***paucifolia*, 78**, *79*
- ***arachnoidea***, *xix*, **78**, *79*, 94
  var. ***aranea* 78**, *79*
  var. ***namaquensis***, *72*, **78**, *79*
  var. ***nigricans*, 78**, *79*
  var. ***scabrispina*, 78**, *79*
  var. ***setata*, 78**, *79*
- ***aristata*, 80**, *81*
- ***bayeri*, 80**, *80*
- ***blackburniae*, 80**, *81*
  var. ***derustensis*, 80**, *81*
  var. ***graminifolia*, 80**, *81*
- ***bobii*, 80**, *81*
- ***bolusii*, - 80**, *81*
  var. ***blackbeardiana*, 80**, *81*
  var. ***pringlei*, 80**, *81*
- ***chloracantha*, 82**, *82*
  var. ***denticulifera*, 82**, *82*
  var. ***subglauca*, 82**, 82
- ***cooperi*, 82**, *83*
  var. ***dielsiana*, 82**, *83*

var. ***doldii***, *83*
var. ***gordoniana***, **82**, *83,* 84
var. ***gracilis***, **82**, *83*
var. ***isabellae***, **82**, *83*
var. ***leightonii***, **82**, *83*
var. ***minima***, **84**
var. ***pilifera***, **82**, *83*
var. ***puberula***, **84**, *83*
var. ***tenera***, *83*
var. ***truncata***, *83*
var. ***venusta***, *83*
var. ***viridis***, **84**, *83*
- ***cymbiformis***, **84**, *85,* 80, 102
var. ***incurvula***, **84**, *85*
var. ***ramosa***, **84**, *85*
var. ***obtusa***, **84**, *85*
var. ***setulifera***, **84**, *85*
- ***cummingii***, **84**, *84*
- ***decipiens***, **84**, *85*
var. ***cyanea***, **84**, *85*
var. ***minor***, **84**, *85*
var. ***virella***, *85*
var. ***xiphiophylla***, **84**, *85*
- *emelyae*, 96
- ***esterhuizenii***, **86**, *87,* 104
- ***floribunda***, **86**, *87*
var. ***dentata***, **86**, *87*
var. ***major***, **86**, *87*
- ***groenewaldii***, **86**, *87*
- ***herbaceae***, **86**, *86*
var. ***flaccida***, **86**, *87*
var. ***lupula***, **86**, *87*
var. ***paynei***, **86**, *87*
- ***joleneae***, **86**, *86*
- ***lockwoodii***, **88**, *89*
- ***maculata***, **88**, *88*
- ***marumiana***, **88**, *89*
var. ***archeri***, **88**, *89*
var. ***batesiana***, **88**, *89*
var. ***dimorpha***, **88**, *89*
var. ***reddii***, **88**, *89*
var. ***viridis***, **88**, *89*
- *marxii*, **88**, *89*
- ***mirabilis***, **90**, *90*
var. ***atrofusca***, **90**, *90*
var. ***badia***, 80, **90**, *91*
var. ***beukmannii***, **90**, *91*
var. ***heidelbergensis***, **90**, *91*
var. ***maraisii***, **90**, *91*
var. ***meiringii***, **90**, *91*
var. ***notabilis***, **90**, *91*
var. ***paradoxa***, **90**, *91*
var. ***pilosa***, 80
var. ***scabra***, **90**, *91*
var. ***splendens***, **90**, 91, *92*
var. ***sublineata***, **90**, *92*
var. ***toonensis***, **90**, *92*
var. ***triebneri***, **90**, *92*
- ***monticola***, **92**, *93*
var. ***asema***, **92**, *93*
- ***mucronata***, **92**, *93*
var. ***habdomadis***, **94**, *93*
var. ***inconfluens***, **94**, *93*
var. ***morrisiae***, **94**, *93, 143*
var. ***rycroftiana***, **94**, *93*
- ***mutica***, **94**, *94*
var. *nigra,* 94
- ***nortieri***, **94**, *95*
var. ***albispina***, **94**, *95*
var. ***globosiflora***, **94**, *95*
var. ***pehlemanniae***, **94**, *95*
- ***odette***, **94**, *95*
- ***outeniquensis***, **94**, *94*
var. ***heroldii***, **94**, *95*
- ***parksiana***, **96**, *97*
- ***picta***, **96**, *96, 97*
var. ***comptoniana***, **96**, *97*
var. ***major'***, **96**, *97*
var. ***multifolia***, **96**, *97*
- ***pubescens***, **98**, *98. 99*
var. ***livida***, **98**, *99*
- ***pulchella***, **98**, *98*
var. ***globifera***, **86**, *87*
- ***pygmaea***, **98**, *99*
var. ***acuminata***, **98**, *99*
var. ***argenteo-maculosa***, **98**, *99*
- ***reticulata***, **98**, *99*
var. ***attenuata***, *99*
var. ***hurlingii***, **98**, *99*
var. ***subregularis***, **98**, *99*
- ***retusa***, **100**, *100*
var. ***nigra***, 94, **100**, *101*
var. ***suberecta***, **100**, *100*
var. ***turgida***, **100**, *101,* 104
Robustipedunculares, Sub-genus, **98**
- ***rossouwii***, **100**, *101*
var. ***calcarea***, **100**, *101*
var. ***elizae***, **100**, *101*
var. ***minor***, **100**, *101*
var. ***petrophila***, **100**, *101*
- ***semiviva***, **102**, *103*
- ***springbokvlakensis***, **102**, *102,* 92
- ***transiens***, **102**, *102*
- ***truncata***, **102**, *103*
var. ***maughanii***, **102**, *103*
- *uitewaaliana*, 99
- ***variegata***, **102**, *103*
var. ***hemicrypta***, **102**, *103*
var. ***modesta***, **102**, *103*
var. ***petrophila***, **102**, *103*
- ***vincentii***, **104**, *104*
- ***vlokii***, **104**, *105*
- ***wittebergensis***, **104**, *105*
- ***zantneriana***, **104**, *105*
var. ***minor***, **104**, *105*
HAWORTHIOPSIS, **106**
- ***attenuata***, **106**, 107
var. ***glabrata***, **106**, 107
var. ***radula***, **106**, 107
- ***bruynsii***, **106**, *106*
- ***coarctata***, **106**, *107*
var. ***adelaidensis***, **106**, *107*
var. ***tenuis***, **106**, *107*
- ***fasciata***, **106**, *107*
- ***glauca***, **106**, 106
- ***granulata***, **108**, *109*
- ***koelmaniorum***, **108**, *108*
var. ***mcmurtyi***, **108**, *108*
- ***limifolia***, **108**, *109*
var. ***arcana***, **108**, *109*
var. ***gigantea***, **108**, *109*
var. ***glaucophylla***, **108**, *109*
var. ***ubomboensis***, **108**, *109*
- ***longiana***, **101**, *101*
- ***nigra***, **101**, *101*

var. ***diversifolia*, 101**, *102*
- ***pungens*, 101**, *102*
- ***reinwardtii*, 101**, *102*
var. ***brevicula*, 101**, *102*
f ***chalumnensis*, 101**, *102*
f ***kaffirdriftensis*, 101**, *102*
f ***olivaceae*, 101**, *102*
f ***zebrina*, 101**, *102*
- ***scabra*, 112**, *113*
var. ***lateganiae*, 112**, *113*
var. ***morrisiae*, 112**, *113*
var. ***starkiana*, 112**, *113*
- ***sordida*, 112**, *113*
var. ***lavranii*, 112**, *113*
- ***tessellata*, 112**, *112, 113*
- ***venosa*,** 108, **112**, *112,* 114
- ***viscosa*, 112**, *113*
- ***woolleyi*, 114**, *115*
Herreanthus meyeri, 338
Hereroa, 316
***HERMANNSCHWARTZIA*, 132**
- ***exasperata*, 132**, *133*
Hexangulares, Sub-genus, **106**
***HOODIA*, 132**, 140, 162
- ***alstonii***, *xvi,* **132**, *133*
- ***annulata*, 132**, *133*
- ***burkei*, 134**, *135*
- ***coleorum*, 134**, *135*
- ***currorii*, 134**, *135.* 138
- ***delaetiana*, 134**, *135*
- ***dregei*, 134**, *135*
- ***flava***, *xix,* **134**, *135*
- *foetida*, 140
- ***gibbosa*, 136**, *137*
- ***gordonii***, 134, **136**, *137,* 138, 166
- ***grandis*, 136**, *137*
- ***juttae*, 136**, *137*
- ***langii*, 138**, *138*
- ***lugardii*, 138**, *139*
- ***macrantha*, 138**, *139*
- ***officinalis*, 138**, *139*
- ***parviflora***, *xviii,* **138**, *138, 139*
- ***pedicellata*, 140**, *141*
- ***pilifera***, 116, **140**, *141*
- ***ruschii*, 140**, *141*
- ***triebneri*, 124**, *125*
Hottentot's bread, 254
***HUERNIA*, 140**
- ***barbata*, 140**, *140*, 146
- ***bayeri*, 142**, *143*
- ***blyderivierensis*, 142**, *143*
- ***brevirostris*, 142**, *142,* 156
subsp. ***baviaana*, 142**, *142*
subsp. ***intermedia*, 142**, *142*
- ***campanulata*, 144**, *145*
- *cashelensis*, 150
- ***clavigera*, 144**, *145*
- ***erectiloba*, 144**, *145*
- ***guttata*, 144**, *145,* 154
subsp. ***calitzdorpensis*, 144**, *145*
- ***hallii*, 144**, *145*
- ***hislopii*, 144**, *145*
subsp. ***robusta*, 144**, *145*
- ***humilis*, 146**, *147,* 154, 156
- ***hystrix*, 146**, *147*
subsp. ***parvula*, 146**, *147*
- ***ingeae*, 146**, *147*
- ***insigniflora*, 146**, *147*
- ***kennedyana*, 146**, *147*
- ***kirkii*, 148**, *149*
- ***leachii*, 148**, *149*
- ***levyi*, 148**, *149*
- ***loesneriana*, 148**, *149*
- ***longii*, 150**, *151*, 154
subsp. ***echidnopsioides*, 150**, *151*
- ***longituba*, 150**, *151*
subsp. ***cashelensis*, 150**, *151*
- ***namaquensis*, 150**, *151*, 156
- ***nouhuysii*, 150**, *150, 151*
- ***occulta*, 152**, *153*
- ***oculata*, 152**, *153*
- ***pendula*, 152**, *153*
- ***piersii*, 152**, *153*
- ***pillansii***, 150, **152**, *153*
- ***plowesii* 154**, *155*
- ***praestans*, 138**, *139*
- *primuina,* 158
- ***procumbens* 154**, *155*
- ***quinta*** 142, **154**, *155*
- ***reticulata*, 154**, *155*
- ***stapelioides*, 156**, *156*
- ***thudichumii* 156**, *157*
- ***thuretii***, 142, **156**, *157*
var. ***primulina***, 142, **156**, *157*
- ***transvaalensis*, 158**, *159*
- ***urceolata*, 158**, *159*
- ***verekeri*, 158**, *159*
var. ***pauciflora*, 158**, *159*
- ***volkartii*, 158**, *160*
var. ***repens*, 158**, *160*
- ***whitesloaneana*, 160**, *161*
- ***zebrina***, 146, **160**, *161*
subsp. ***magniflora*, 160**, *161*
***HUERNIOPSIS*, 160**, 184, 186
- ***atrosanguinea*, 160**, *161*
- ***decipiens*, 146**, *146*

I

***IHLENFELDTIA*, 378**
- ***excavata***, *xix,* **378**, *381*
- ***vanzylii*, 380**, *380*

J

***JORDAANIELLA*, 380**
- ***spongiosa*, 380**, *381*
***JUTTADINTERIA*,** 316, **380**, 406
- ***albata*, 380**, *381*
- ***simpsonii*, 380**, *381*

K

***KALANCHOE*, 452**
- ***crenata*, 452**, *452*
- ***rotundifolia*, 454**, *454*
- ***thyrsiflora*, 454**, *455*
Kambroo, 240
Kanniedood, 64
***KHADIA*, 380**
- ***acutipetala*, 380**, *381*
- ***alticola*, 380**, *381*
- ***beswickii*, 380**, *380*
- ***carolinensis*, 380**, *381*
Lampranthus, x, 410

Kraal aloe, 14
***KUMARA*, 66**
- ***disticha*, 66**, *67*
- ***haemanthifolia***, 66, **66**, 67

L

Lampranthus, 410
LAPIDARIA, 382
- ***margaretae*, 382**, *383*
***LARRYLEACHIA*, 162**, 164
- ***cactiformis*, 162**, *163*, 166
- *dinteri, 164*
- ***felina*, 162**, *163*
- ***marlothii*, 162**, *163*
- ***perlata*, 164**, *165*, 166
- ***picta*, 164**, *165*, 166
- ***tirasmontana*, 164**, *165*
***LAVRANIA*, 164**
- ***haagnerae*, 164**, *165*
LITHOPS xiv, xv, 310, **384**
- ***aucampiae*, 384**
  subsp. ***aucampiae* var. *aucampiae*, 384**, *385*
  subsp. ***euniceae* var. *euniceae*, 384**, *385*
  subsp. ***euniceae* var. *fluminalis*, 384**, *385*
  subsp. ***aucampiae* var. *koelemanii*, 384**, *385*
- ***bromfieldii*, 384**, *385*
  var. ***glaudinae*, 384**, *385*
  var. ***insularis*, 384**, *385*
  var. ***mennellii*, 384**, *385*
- ***coleorum*, 386**, *387*
- ***comptonii*, 386**, 400
  var. ***comptonii***, 344, **386**, *387*
  var. ***weberi***, 344, **386**, *387*
- ***dinteri*, 386**
  subsp. ***brevis* var. *brevis***, 386, **386**, *387*,
  var. ***dinteri***, 344, **386**, *387*
  subsp. ***frederici*, 386**, *387*
  subsp. ***multipunctata*, 386**, *387*
- ***divergens*, 386**
  var. ***amethystina*, 386**, *387*
  var. ***divergens*, 386**, *387*
- ***dorotheae*, 386**, *387*, 396
- ***francisci*, 388**, *388*
- ***fulviceps*, 388**
  var. ***fulviceps*, 388**, *389*
  var. ***lactinea*, 388**, *389*
- ***gesineae*, 388**
  var. ***gesineae*, 388**, *389*
  var. ***annae*, 388**, *389*
- ***geyeri***, 388, **388**, *389*
- ***gracildelineata***, 388, **388**, *389*
subsp. ***brandbergensis***, *390*, **389**
subsp. ***gracildelineata* var. *gracildelineata*, 388**, *389*
  subsp. ***gracildelineata* var. *waldroniae*, 390**, *390*
- ***hallii*, 390**
  var. ***hallii*, 390**, *391*
  var. ***ochraceae*, 390**, *391*
- ***helmutii*, 390**, *391*
- ***hermetica*, 390**, *391*
- ***herrei***, 148, 388, **390**, *391*
- ***hookeri*, 392**
  subsp. ***subfenestrata***, *393*
  subsp. ***dabneri***, *393*
  subsp. ***hookeri***, *393*
  subsp. ***marginata***, *393*
  subsp. ***susannae***, *393*
- ***julii*, 392**
  subsp. ***brunnea*, 392**, *392*
  subsp. ***fulleri*, 392**, *392*
  subsp. ***julii*, 392**, *392*
  subsp. ***rouxii*, 392**, *393*
- ***karasmontana*, 392**
  subsp. ***bella*, 392**, *394*
  subsp. ***eberlanzii*, 392**, *394*
  subsp. ***karasmontana* var. *aiaisensis*, 392**, *393*
  subsp. ***karasmontana* var. *karasmontana*, 392**, *393*
  subsp. ***karasmontana* var. *karasmontana* var. *immaculata***, *393*
  subsp. ***karasmontana* var. *lericheana*, 392**, *394*
  subsp. ***karasmontana* var. *tischeri*, 392**, *394*
- ***lesliei*,** *xvii*, 384, 386, **394**
  subsp. ***burchellii*, 394**, *395*
  subsp. ***lesliei* var. *hornii*, 394**, *395*
  subsp. ***lesliei* var. *leslei* var. *lesliei*, 394**, *395*
  subsp. ***lesliei* var. *lesliei* var. *venteri*, 394**, *395*
  subsp. ***lesliei* var. *minor*, 394**, *395*
  subsp. ***lesliei* var. *rubrobrunnea*, 394**, *395*
  fa *'albinica'* **394**, *395*
- *localis*, 400
- ***marmorata*, 394**
  var. ***elisae*, 394**, *395*
  var. ***marmorata*, 394**, *395*
- ***meyeri*, 396**, *397*
- *nelii*, 398
- ***naureeniae***, 384, **396**, *397*
- ***olivaceae*, 396**
  var. ***nebrownii*, 396**, *396*
  var. ***olivaceae*, 396**, *396*
- ***optica*, 396**, *397*
  fa. *'rubra'*, **396**, *397*
- ***otzeniana*, 398**, *398*
- ***pseudotruncatella***, 390, **398**
  ***subsp. archerae*, 398**, *399*
  ***subsp. dendritica*, 398**, *399*
  ***subsp. groendrayensis*, 398**, *399*
  subsp. ***pseudotruncatella* var. *elisabethiae*, 398**, *399*
  subsp. ***pseudotruncatella* var. *pseudotruncatella*, 398**, *399*
  subsp. ***pseudotruncatella* var. *riehmerae*, 398**, *399*
  ***subsp. volkii*, 382**, *383*
- ***ruschiorum***, 378, **382**, 388, 398
  var. ***lineata*, 398**, *398*
  var. ***ruschiorum*, 398**, *398*
- ***salicola*, 400**, *401*
- ***schwantesii* 400**
  var. ***gebseri*, 400**, *401*
  var. ***marthae*, 400**, *401*

var. ***rugosa***, **400**, *401*
var. ***schwantesii***, **400**, *401*
var. ***urikosensis***, **400**, *401*
- ***terricolor***, **400**, *401*
- *turbiniformis*, 392
- ***vallis-mariae***, **400**, *400*
- ***verruculosa***, **402**,
var. ***glabra***, **402**, *403*
var. ***verruculosa***, **402**, *403*
- ***villetii***, **402**,
subsp. ***deboeri***, **402**, *403*
subsp. ***kennedyi***, **402**, *403*
subsp. ***villetii***, **402**, *403*
- ***viridis***, H, **402**, *403*
- ***werneri***, **402**, *402*
XLUCKHOFFIA, **166**
- ***beukmannia***, **166**, *167*

M

MESEMBRYANTHEMACEAE, **304**
Mesembryanthemum, x, 422
- *lapidiforme*, 382
MEYEROPHYTUM, **402**
- *globosum*, 402
- ***meyeri*** **402**, *403*
MITROPHYLLUM, **404**
- ***clivorum***, **404**, *405*
- ***grande***, **404**, *405*
- ***mitratum***, **404**, *405*
MONADENIUM, **302**
- ***lugardiae***, **302**, *303*
- ***schubei***, **302**, *303*
MONILARIA, 402, **404**
- ***chrysoleuca***, **404**, *405*
Monsonia, 240, 246
MORINGACEAE, **470**
MORINGA, **470**
-***ovalifolia***, **470**, *470*, 471
MUIRIA, *305*, 354, 370, **404**
- ***hortenseae***, *xvii*, **404**, *404, 405*
xMuiriogibbaeum muiroides, **404**, *405*

N

NAMAQUANTHUS **406**
- ***vanheerdii***, **406**, *406*
NAMIBIA, **406**
- ***cinerea***, 406
- ***pomonae***, **406**, *406*
NANANTHUS, **406**, 416
- ***aloides***, **406**, *406*
- ***pole-evansii***, **406**, *406*
- ***vittatus*** **406**, *406*
NELIA, **406**
- *meyeri*, 406
- ***pillansii***, 406, **408**, *409*
NEOHENRICIA
- ***sibbettii***, **408**, *409*, 424
- ***spiculata***, **408**, *409*
NEOPECTINARIA, **166**, 168
- ***breviloba***, **166**, *167*
- ***pillansii***, **166**, *167*
- ***saxatilis***, **166**, *167*
- ***stayneri***, **168**, *169*
NOTECHIDNOPSIS, **168**, 198
tessellata, **168**, *169*, 198

O

ODONTOPHORUS, **408**
- ***angustifolius***, **408**, *409*
subsp. ***angustifolius***, **408**, *409*
subsp. ***protoparcoides***, **408**
- ***marlothii***, **408**, *408*
- ***nanus***, **410**, *411*
OOPHYTUM, **410**
- ***nanum*** **410**, *410, 411*
- *nordenstamii*, 410
- ***oviforme*** **410**, *411*
OPHIONELLA, 132, **168**
- ***arcuata***, 168, **168**, *169*
- ***mirkinii***, **168**, *169*
- ***willowmorensis***, **168**, *169*
Ophthalmophyllum, 326, 368, 384
ORBEA, 124, **170**, 182, 208, 224
- *chibensis*, 180
- ***ciliata***, **170**, *171*
- ***cooperi*** **170**, *171*
- ***doldii***, **170**, *171*, 172, 176
- ***elegans***, **170**, *171*
- ***halipedicola*** **172**, *173*
- *kaokoensis*, 172
- ***longidens*** **172**, *173*
- *longii*, 224
- ***macloughlinii***, 170, **172**, *173*, 176
- ***maculata*** **172**, *173*, 174
subsp. ***kaokoensis***, **172**, *173*
- ***namaquensis*** **174**, *175*
- ***paradoxa*** **174**, *175*
- ***pulchella*** **174**, *174*
- ***rangeana***, **174**, *175*
- ***speciosa*** 160, **176**, *177*
- ***tapscottii***, **176**, *177*
- ***umbracula***, *xvii*, **176**, *177*
- ***variegata*** 174, **176**, *177*
- ***verrucosa***, **176**, *177*
subsp. ***fucosa***, **176**, *177*
- ***woodii***, **178**, *179*
ORBEANTHUS, **178**
- ***conjuncta***, **178**, *179*
- ***hardyi***, **178**, *179*
ORBEOPSIS, **178**
- ***albocastanea***, **178**, *179*, 180
- ***caudata*** **180**, *181*
subsp. ***rhodesiaca***, **180**, *181*
- *chibensis*, 180
- *elongata*, 180
- *flava*, 180
- ***gerstneri***, **180**, *181*
subsp. ***elongata***, **180**, *181*
- ***huillensis***, **180**, *181*
subsp. ***flava***, **180**, *181*
- ***knobelii***, 178, **180**, *181*
- ***lutea*** **180**, *181*
subsp. ***vaga*** **180**, *181*
- *elongata*, 180
- *flava*, 180
- ***melanantha***, **182**, *183*
- *occidentalis*, 182
- ***tsumebensis***, **182**, *183*
- ***valida*** **182**, *183*
subsp. ***occidentalis***, **182**, *183*
- *vaga*, 182
ORTHOPTERUM, **410**

- *coeganum*, **410**, *411*
- *waltonii*, **410**, *411*
OSCULARIA, **410**
- *lunata*, **412**, *413*
OTHONNA, **120**
- *arbuscula*, **120**, *121*
- *clavifolia*, **120**, *121*
- *cyclophylla*, **120**, *121*
- *euphorbioides*, **122**, *123*
- *opima*, **122**, *123*
- *pygmaea*, **122**, *123*

P

PACHYCYMBIUM, **182**, 168
- *carnosum* Stent, **182**, *183*, 184
- *keithii*, **184**, *185*
- *lancasteri*, **184**, *185*
PACHYPODIUM, xii, **118**
- *bispinosum*, **118**, *119*
- *lealii*, **118**, *119*
- *namaquanum*, *xviii*, **118**, *118, 119*
- *saundersii*, 118, **120**, *120, 121*
- *succulentum*, **120**, *121*
Partridge-breast aloe, 64
PASSIFLORACEAE, **252**
PECTINARIA, 132, **184**, 184, 226
- *articulata*, **184**, *185*
- *asperifolia*, **184**, *185*
- *borealis*, **184**, *185*
- *namaquensis*, **184**, *185*
PEDALIACEAE, **458**
PEERSIA, **412**
- *frithii*, **412**, *413*
- *vanheerdei*, **412**, *413*
PELARGONIUM, **240**
- *carnosum*, **240**, *241*
- *ceratophyllum*, **242**, *243*
- *cortusifolium*, **242**, *243*
- *crassicaule*, **242**, *243*
- *crithmifolium*, **242**, *242*
- *dasyphyllum*, **244**, *245*
- *echinatum*, **244**, *245*
- *fulgidum*, **244**, *245*
- *klinghardtense* **244**, *245*
- *paniculatum* **244**, *245*
- *sibthorpiifolium* **244**, *245*
- *spinosum*, **246**, *247*
PHYLLOBOLUS, 358, **412**
- *resurgens*, **412**, *413*
PIARANTHUS, 160, **186**
- *barrydalensis*, **186**, *187*
- *comptus*, **186**, *187*
- *cornutus*, 186
- *decorus*, **186**, *187*
subsp. *cornutus*, **186**, *187*
- *framesii*, **186**, *187*
- *geminatus*, **186**, *187*
var. *foetidus*, **186**, *187*
- *parvulus*, **188**, *189*
- *punctatus*, **188** *189*
PLEIOSPILOS, **412**, 422
- *bolusii*, **412**, *413*
- *compactus*, **412**, *413*, 414
subsp. *canus*, *305*, *413*, **414**
subsp. *compactus*, *413*, **414**
- *nelii*, **414**, *415*
- *simulans*, **414**, *415*
PORTULACACEAE Juss, **468**
PORTULACARIA 444, **468**
- *afra*, **468**, *469*
- *armianum*, **468**, *469*
Prenia pallens **var**. *namaquensis*, x
PREPODESMA, **414**
- *orpenii* **414**, *415*
PSAMMAPHORA, **414**
- *longifolia*, **414**, *415*
- *modesta*, **414**, *415*
- *nissenii*, **414**, *415*
PTERODISCUS, **458**
- *speciosus*, **458**, *459*

Q

QUAQUA, 124, **188**
- *acutiloba*, **188**, *189*
- *arenicola*, **188**, *189*, 196
- *arida*, **188**, *189*
- *armata*, **190**, *191*
- *aurea*, **190**, *191*
- *bayeriana*, **190**, *191*
- *cincta*, **190**, *191*
- *confusa*, **190**, *191*, 194
- *dependens*, **192**, *193*, 194
- *framesii*, **192**, *193*
- *gracilis*, **192**, *193*, 194
- *hottentotorum*, **192**, *193*, 198
- *incarnata*f, **192**, *193*, 198
- *inversa*, **192**, *193*
- *linearis*, **194**, *195*
- *mammillaris*, **194**, *195*
- *maritima*, **194**, *195*
- *multiflora*, **194**, *195*
- *pallens*, **194**, *195*
- *parviflora*, 190, **194**, *195*
- *pilifera*, **196**, *197*
- *pillansii*, **196**, *197*
- *pruinosa*, **196**, *197*
- *pulchra*, **196**, *197*
- *ramosa*, **196**, *197*
- *swanepoelii*, 194, **198**, *199*
- *tentaculata*, **198**, *199*

R

RABIEA, **416**
- *albipuncta*, **416**, *417*
RHINEPHYLLUM, **416**
- *graniforme*, **416**, *416*
- *inaequale*, **416**, *417*
- *muirii*, *375*, **416**, *417*
- *parvifolium*, **416**, *417*
- *pillansii*, **416**, *417*
- *rouxii*, **416**, *417*
RHOMBOPHYLLUM, **418**
- *dolabriforme*, **418**, *418*
- *rhomboideum*, **418**, *419*
RICHTERSVELDIA, 168, **198**
- *columnaris*, 168, **198**, *199*
Ruschia, x
RUSCHIANTHUS, **418**
- *falcatus*, **418**, *419*

S

SAPHESIA, **418**
- ***flaccida***, **418**, *419*
SARCOCAULON, 240, **246**
- ***camdeboense***, **246**, *247*
- ***ciliatum***, **246**, *247*
- ***crassicaule***, **246**, *246*, *247*
- ***flavescens***, **248**, *249*
- ***herrei***, **248**, *249*
- ***inerme***, **248**, *248*
- ***l'heritieri***, **248**, *249*
- ***marlothii***, **248**, *248*, *249*
- ***mossamedense***, **250**, *251*
- ***multifidum***, *xvi*, **250**, *251*
- ***patersonii***, **250**, *251*
- ***peniculinum***, *xvi*, **250**, *250*
- ***salmoniflorum***, **252**, *253*
- ***vanderietiae***, **252**, *253*
SCHWANTESIA, 382, **418**
- ***acutipetala***, **418**, *419*
- ***herrei***, **420**, *421*
- ***ruedebuschii***, **420**, *421*
- ***speciosa***, **420**, *421*
SENECIO, **122**
- ***aizoides***, **122**, *122*
- ***haworthii***, **122**, *122*
- ***radicans***, **122**, *123*
- *rowleyanus*, 122
SESAMOTHAMNUS, **460**
- ***benguellensis***, **460**, *460*
- ***guerichii***, **460**, *461*
- ***lugardii***, **460**, *461*
STAPELIA, **198**
- ***acuminata***, **198**, *199*
- ***arenosa***, 166, **198**, *199*
- ***asterias***, **200**, *201*
- ***baylissii***, 200, **200**, *201*
- ***cedrimontana***, **200**, *201*, 208
- ***clavicorona***, **200**, *201*
- ***divaricata***, **200**, *201*
- ***engleriana***, **202**, *203*, 210
- ***erectiflora***, 202, **202**, *203*
  var. ***prostratiflora***, **202**, *203*
- ***flavopurpurea***, xiii, **202**, *203*
- ***gariepensis***, 200, **202**, *203*
- ***gettliffei***, **202**, *203*
- ***gigantea***, **204**, *205*, 214
- ***glanduliflora***, 202, **204**, *205*
- ***grandiflora***, **204**, *205*
  var. ***conformis***, **204**, *205*
- ***hirsuta***, 200, 202, **204**, *205*, 214
- ***immelmaniae***, **204**, *204*, 208
- ***kougabergensis***, **206**, *207*
- ***kwebensis***, 206, **206**, *207*
- ***leendertziae***, **206**, *207*
- ***longipedicellata***, **206**, *207*
- ***macowanii***, **206**, *207*
  var. ***conformis***, **206**, *207*
- ***montana***, **208**, *209*
- ***obducta***, **208**, *209*
- ***olivacea***, **208**, *209*
- ***paniculata***, 208, **208**, *209*
- ***pearsonii***, **208**, *209*
- ***peglerae***, 200, **208**, *209*
- ***pillansii***, **210**, *211*
  var. ***fontinalis***, **210**, *211*
- ***praetermissa***, 200, **210**, *211*
- ***pulvinata***, **210**, *211*
- ***remota***, **210**, *211*
- ***rubiginosa***, **210**, *211*
- ***rufa***, **212**, *213*
- ***schinzii***, **212**, *213*
  var. ***bergeriana***, **212**, *213*
- ***scitula***, **212**, *213*
- ***similis***, 206, **212**, *213*
- ***surrecta***, **214**, *215*
- ***tsomoensis***, 200, **214**, *215*
- ***unicornis***, **214**, *215*
- ***vetula***, 200, **214**, *215*
- ***villetiae***, **214**, *215*
STAPELIOPSIS, 132, 166, **216**
- ***khamiesbergensis***, 216, **216**, *217*
- ***neronis***, 216, **216**, *217*
- ***urniflora***, 216, **216**, *217*
STOMATIUM, 416, **420**
- ***alboroseum***, *xix*, **420**, *421*
- ***bolusiae***, **420**, *421*
- ***difforme***, **420**, *421*
- ***fulleri***, **420**, *421*
- *muscullinum*, 320
- ***mustellinum***, **420**, *421*
- ***ryderae***, **420**, *421*
- ***suaveolans***, **422**, *423*
- ***triferum***, **422**, *423*
- ***villetii***, **422**, *423*
SYNAPTOPHYLLUM, x, **422**
- ***juttae***, **422**, *423*

T

TANQUANA,***305***, ***412***, **422**, *423*
- ***archeri***, **422**, *423*
- ***hilmarii***, **422**, *423*
- ***prismatica***, 386, **422**, *423*
TAVARESIA, **216**
- ***barkleyi***, **216**, *217*, 218
- ***thompsoniorum***, **216**, *217*
Telochistes capensis, *446*
Testudinaria, 254
TITANOPSIS, **424**
- ***calcarea***, **424**, *425*
- *fulleri*, 424
- ***hugo-schlecteri***, **424**, *425*
- ***schwantesii***, **424**, *425*
Trichocaulon, 134, 146, 162
- *alstonii*, 132
- *pillansii*, 134
- *officianale*, 138
- *piliferum*, 140
- *triebneri*, 140
TRICHODIADEMA, **424**
- ***bulbosum***, **424**, *425*
- ***densum***, **424**, *425*
TRIDENTEA, **218**, 206, 222
- ***aperta***, **218**, *219*
- *baylissii*, 222
- *choanantha*, 222
- ***dwequensis***, **218**, *219*
- ***gemmiflora***, **218**, *219*
- ***jucunda*** **218**, *219*
  var. ***cincta***, **218**, *219*
  var. ***dinteri***, **218**, *219*
- *longii*, 222
- ***marientalensis***, **220**, *221*
  subsp. ***albipilosa***, **220**, *221*

- ***pacchyrrhiza***, *xvii*, **220**, *221*
- ***parvipuncta* 220**, *221*
  var. ***truncata*, 220**, *221*
- *truncata 'pusilla', 221*
- ***peculiaris*, 220**, *221*
- ***pedunculata*, 222**, *223*
- ***virescens* 222**, *223*
TROMOTRICHE, 218, **222**
- ***baylissii***, 200, **222**, *223*
  var. ***ciliata*, 222**, *223*
- ***choanantha***, 206, **222**, *223*
- ***herrei* 222**, *223*
- ***longii*, 224**, *225*
- ***longipes*, 224**, *225*
- ***revoluta*, 224**, *225*
- ***ruschiana*, 224**, *225*
- ***thudichumii*, 224**, *225*
- ***umdausensis*, 210**, *211*
Trichocaulon, 198
***TULISTA*, 98**
- ***kingiana*, 98**, *99*
- ***marginata*, 98**, *99*
- ***minima*, 98**, *99*
  var. ***poellnitziana*, 98**, *99*
- ***pumila*, 100**, *101*
TYLECODON, 428, **454**
- ***buchholtzianus*, 454**, *455*
  var. ***fasciculatus*, 454**, *455*
- ***grandiflorus*, 454**, *455*
- ***hallii*, 454**, *455*
- ***paniculatus*, 454**, *455*
- ***pearsonii*, 456**, *457*
- ***pygmaeus*, 456**, *457*
- ***racemosus*, 456**, *456*
- ***reticulatus*, 456**, *457*
  subsp. ***phyllopodium*, 456**, *457*
- ***rubrovenosus*, 458**, *459*
- ***schaeferianus*, 458**, *459*
- ***sulphureus*, 458**, *459*
- ***wallichii*, 458**, *459*
  subsp. ***ecklonianus*, 458**, *459*

V

VADULIA, 226
- ***longipes*, 226**, *227*
- ***villetii*, 226**, *227*
- ***maughanii*, 226**, *227*
***VANHEERDEA*, 424**
- ***roodiae*, 424**, *425*
VITACEAE, 470
Vlokii ater, 360

W

WELWITSCHIACEAE, 474
WELWITSCHIA, 474, **474,** *475*
- ***mirabilis*, 474**, *475*



Stapelia clavicorona

Collectors' Edition

Jo, Ben, Rori & Gaby
Christian Blenn
Joshua E. Bradley
The Brenthurst Library
Mariette & Frans Breytenbach
Francis S. Bueno, San Diego
Brendan J. Burke
Alejandro Carillo M.
Mark, Jasper & Sequoia Charlinski
Wesley Chin
Francois Coetzee
Thomas Cole
Wynand & Elizabeth du Plessis
Gregor Fols
Luuts Feenstra
Isabel Fitzgerald
Robin & Joy Frandsen
Jeffrey Frandsen & Sarah Short
David Frandsen & Barbara Meier
Brian A. Goddard
Kelly J. Griffen
Kim Hamilton
Rob Jarvis
Martin Hammond
Rachel Harlech-Jones
Chris F. Kleiss
Jack Latti
Hyunseok Lee
Dr Adrian David Marais
Terry McChesney
Erica McCoy
Tom & Mo McCoy
Alexander Meshcheryakov
Missouri Botanical Garden Library
Peter H. Raven Library
Rachel Saunders
Detlief H. Schnabel & Birgit Schmitz
Joe Tang
Ong Poh Teck
Abraham E. van Wyk
Reep Verloren
Dominic Wilson

Subscribers' Edition

Christope Alain - Plantemania
Christopher Allen
Chris Backhouse
Alberto Ballerio
Cheryl Barker
Bob Barth
Jeffrey Beattie
Alexandra Begg
Elizabetta Bergonzo
Rolf Bekker
Jo, Ben, Rori & Gabi
Marcello Bellegoni, Italy
N.J. Berkel
Elisabetta Bergonzo
M.C. Bester
Pieter Bester
Priscilla Burgoyne
Prof. Gerhard & Isolde Beukes
H.J. Birks
Rick Bjorklund
Pat Blackstock

Christian Blenn

Alexey Bobrov

Dominique Borel

Jacob Johannes Boshoff

Wiebe Bosma

Botanic Garden Meise, Belgium

Paul J. Botha

Yu, Bo-Jheng, 余柏政

Samantha Bradley

Bill Branch

Antje Braxmair

Etienne Bredell

Paul D. Brink

David Bye

Cactus4Africa

Cactus & Succulent Society of Massachusetts

C & S Society of South Australia

C & S Society of Queensland

Barry Cameron

John Canali

Katie Carbonari

Paul R. Carlberg

Richard Carlson

Robert Carpenter

Steven H. Casebolt

Kevin & Irene Cassidy

Chin Chou Chang, 張經周

Chun Yao Chang, 張竣堯

Ming Zong Chang, 張名宗

Shuo Wen Chang, 張碩文

Yu Hong Chen, 陳俞宏

You Xiang Chen, 陳祐勝

Volarth Chi, 紀俊漢

Wesley Chin

Tseng Ching-Nan, 曾景南

Bill Chou, 周伯勳

Fu-hsu Chou, 周福旭

Sheng Chun Chu, 朱盛均

Chin An Chung, 鐘啟元

Vee Clark

Maree Clarkson

Johan Volstruis Combrink

Connecticut Cactus & Succulent Society

Central Oklahoma C& S Society

Ashley Kelvin Cook

Luke Cook, Adelaide, Australia

Desmond and Naureen Cole

Eduard Cornelissen

Dr Ivor Crook

Greg & Alice Daniels

Neil & Meryl Davis

Dave Dawson, Auckland, NZ

W. Richard J. Dean & Sue Milton-Dean

Dr Peter Debold

Jacques Deleuze

Aldo Delladdio

David D. Desper Jr

Mark Detterman

Mary de Wijn

Oddgeir Djoeseland

Wynand & Elizabeth du Plessis

Werner du Toit

W.T.F. & C.J.F. du Toit

Bruce Dyke

Urs Eggli

Benno Eller

Anthon Ellert

Carol Englander

B.H. Erasmus. In loving memory

Francois Esterhuizen

Dr Jörg Ettelt

Wolfgang Ewest

Chris Eyers

Thomas Fabbian

Joan Faiola

Eli Fallaux

Ulrich Feiter

Jacq Felis

Liu Chi-Feng, 劉岐峰

Isabel Fitzgerald

Marc Flandre

Ray & Merle Forster

Paul Foster

Ori Fragman-Sapir

David Frandsen & Barbara Meier

Henry & Pat Frandsen

Jeffrey Frandsen & Sarah Short

Joy Frandsen

Daiv Freeman

Graeme J.A. Frith

Georg & Hannes Fritz

Carlo Gagiano

Claudia Garcia

Howard & Monica Gie

Kelly Gertig

Patrick Giassen

Sean Gildenhuys

Brian Goddard

Kerry Graham

Gratianus, 羅彥鈞

Kelly J. Griffen

Hans Grinwis

Anthony & Robyn Gwilt

Sue Haffner

Kim Hamilton

Ileen Hanekom

Larissa Haney

Andrew Hankey

Tony Harcourt

Joshua Burton Haskell

George Hattingh

Herbert Haug

Chun Der He, 何俊德

Achim Hecktheuer

Theo Heijnsdijk

Emile Heunis

Maris Heydenrych

Tienboon Ho, 何明田

Rob Hofberg

Max Holmes

Brett Hopkins

Chen Hao Hsien, 陳浩賢

Allen Hsu, 許倫國

Rock Hsu

C. Y. Hu

Andrew Huang, 黃俊龍

B. C. Huang, 黃斌宗

Ko Huang, 柯歡

Chiang Keng Hung

Mark Hyde

Thomas Richard Jansen van Rensburg

Huang, Jhang-Ci, 黃章齊

Dr Jan Martin Jecminek

Kuba Jilemicky

Raimer Joestingmeier

Rita Marais Johnson

Willie Jonker

Dr J.P. (Amo) Jordaan

Antal Kalocsai

Thomas Kalweit

Maria Kawka

Jan-Hendrik & Rochelle Keet

Waltroud & Bernd Keller

Christopher Kettinger

Chris Kingsley

Bill H Kinsey

Bernhard Kleeberger

Leo Klemm

Arrie & Ronell Klopper

Koeltz Botanical Books

Jacquie Koutsoudis

Rainer Krause

Tessa Kum

Danie L Labuschagne

Laurie Lagasse

Chi Yang Lai, 賴吉洋

Joey Lai, 賴炯屹

Ivan Lätti

John Jacob Lavranos

Bertie Lee, 李玉嬌

Hyunseok Lee

Riana Lee

Tony Lee, 李韋銘

Wang Leo

Mary Liz Lewis

Mateo Lichtenstein

Chien Chung Lin, 林建江

Jhihhao Lin, 林志豪

Pro Ling, 佩玲

Jeff Liu, 劉建福

Lithops For Sale Australia

Alvin Francis Lok

Johan Louter

David Ma, 馬如宏

M.J.T. Maessen-Claessen

Dorothy E. Malan

Dr Adrian David Marais

Michael Marais

Ralph R. Martin

Terry K. McChesney

Dr Detlev Metzing

Amanda Mileson

Lee J. Miller

Laurent Moix

Alma Moller

Roger Monge

Peter Moni

Johan & Marietha Moolman

Jessica Moolman

Dave Morgan

Roy Mottram

Ute Mueller

John Mulder

Jan Myburgh

Bryan Nathan

Desmond L. Nielsen

Kathie Nel

Philip Nel

New York Botanical Garden

Shawn Ng 黃琮傑

Geoff & Lynne Nichols

Frans Noltee

Louise Oczkowski

Oddgeir DjÃ, Seland

Ian Oliver

Richard Oliver

Gary Ong

Cobus P.J. Oosthuizen

Dr Matthew Opel

Andy Palmer

Jeff Pavlet

Dean Pendrigh, Christchurch, New Zealand

Kenneth Preteroti

Richaud Phillippe

Nigel Pickering

Judy Pigue

Rob Plowes

Dr L. Polling PhD. (Zoology)

Tinus Potgieter

Hannes Pretorius

Samuel Ralston

Roberto Rastelli

Anthony Rausch

Mark Everard Read

Kotie & Arda Retief

Brian Robbeson

Dr Richard J. Roberts

John Robertson

Robin Plants, Bapsfontein

Leigh and Irene Robinson

Wayne Robinson

Abigal Rorer

Kay Runge

Renu-Karoo Veld Restoration cc

Carol Russell

Universitätsbibliothek, Salzburg

SANBI Libraries

José Manuel M. Sanchez

San Diego Cactus & Succulent Society

San Diego Zoo, Library

Art Scarpa

Georg Schelinski

Riet Schuerman

Robert Scott (Shire Bulbs)

David M. Schultz

Jeffrey Sedwin

Paco Serrano

Joaquim Casé Serran

Christina M. Serrone

Judy Shaw

Tien-Li Sheng

Liou Shih-kai, 劉適凱

Gerhard Sieberg

Silverhill Seeds & Books

Melanie Simpson

Gerd W. Skala, Puchenau, Austria

Rudolph Slabbert

Ruth Smart

Andrew Smith

In memory of Liliane Smith

Sharon Smith Delisle

Michael Somers

Mike Spies - Namakwa Toere

Rene Stalder

Patrick Stapeliaficionada

Estelle & Lucas Steenkamp

François Steffens

Frank Streeter

Kuo-Yuan Su, 貢丸

Chia Cheng Sue, 蘇家正

Tuan Su-Nung, 段書農

Joylene Sutherland

Pieter & Renschke Swart

Audrey Tang

Joe Tang

Barry Tibbetts

H M Tregarthen

Walter C Trew

Gilda and Alfonso Trudu

Ronald Uijs

Ken Uy

Jerry Vaninetti. with thanks to my Mom Bette

Nicky & Fred van Berkel

Dr P.W. van der Walt

Willem van Greunen

Cheryll van Niekerk

Jacob van Pareen

Darius van Rensburg

Ds T.J. van Vuuren

Stella van Vuuren

Joan & Flip Venter

Jaap Viljoen

Loukie Viljoen

Luani Visser

Jean-Louis Volat

Hanlie Vorster

Andrea Wakefield

Michele Walters

Chenxing Wang

Chris Wang, 汪育

Dr Wolfgang Weber

Judd Kirkel Welwitch

Wolwekraal Conservation & Research Organisation

Dennis Wu

Kenny Wu

Wei Xiong

Dong Ya, 東夜

Lena Yang, 楊如玉

Huang, Yu-Kai, 黃煜凱

Massimo Zanchi

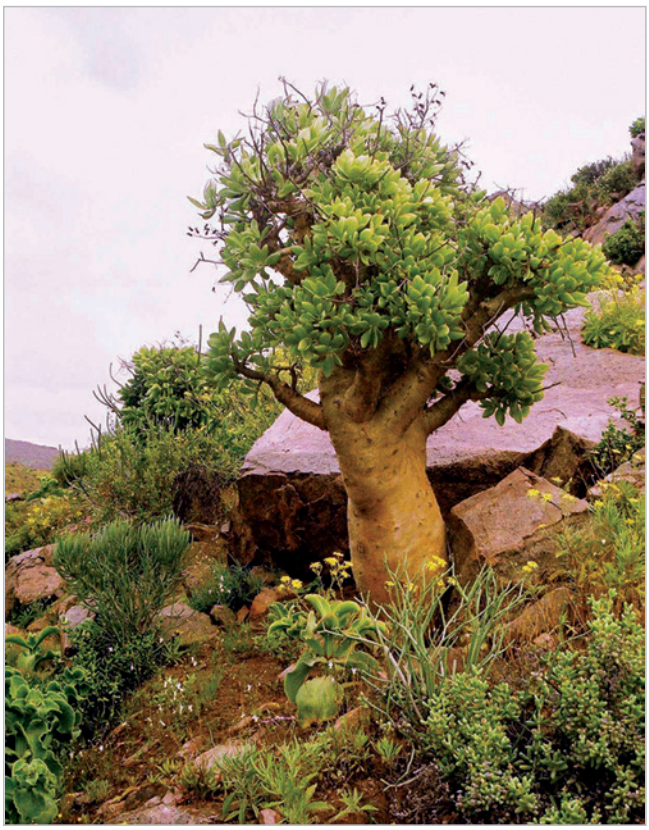
Ng Zhongjie

Henri Zissler, France

Benjamin Zwittnig



Muiria hortenseae



Tylecodon paniculatus



Aloe striata



Euphorbia fusca



Crassula hemisphaerica



Cheiridopsis brownii



Quaqua confusa



Gibbaeum shandii



Stapelia asterias



Aloe chortolirioides



Oopytum nanum



Stapelia villettiae



Gibbaeum album & Muiria hortenseae



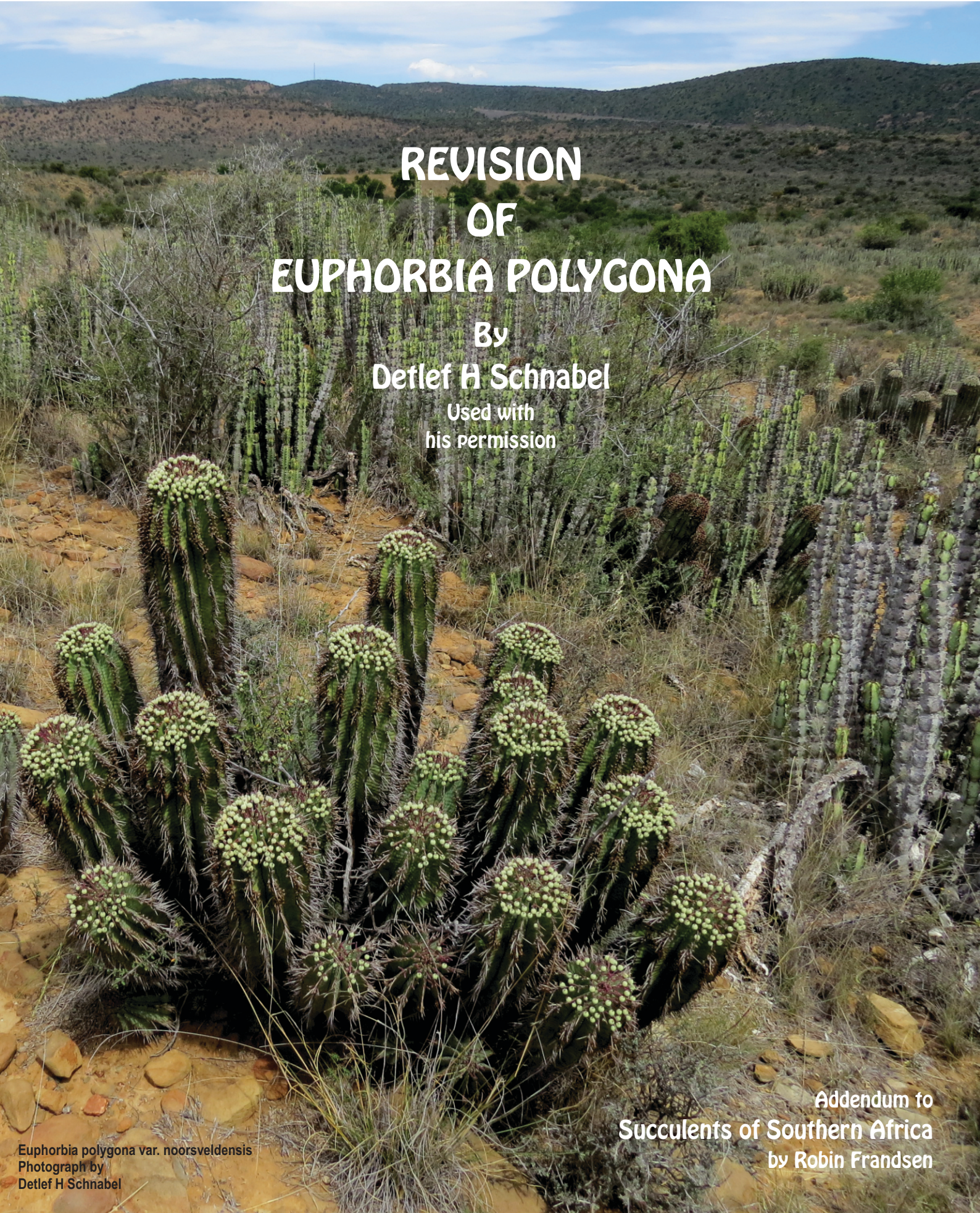
Adenia pechuëlii



Pachypodium lealii



Euphorbia horrida



REVISION OF EUPHORBIA POLYGONA

By

Detlef H Schnabel

Used with his permission

Euphorbia polygona var. noorsveldensis
Photograph by
Detlef H Schnabel

Addendum to
Succulents of Southern Africa
by Robin Frandsen

INTRODUCTION

In his description of *Euphorbia polygona*, Haworth included the similar species *E. enoplia* Stapf. and *E. horrida* Boiss. The inclusion by Haworth of *E. horrida* seems to have been subsequently ignored and the species *E. horrida* was then widely accepted. Based on literature studies and by applying traditional classification, Mr Schnabel has identified twelve of the presently accepted taxa as being naturally distinct variations of *E. polygona*. The complex is highly variable as the following descriptions show:

EUPHORBIA POLYGONA and its varieties

1.

Euphorbia polygona Haw. var. ***polygona***

Var. ***polygona*** Haw. This nominate dioecious variety is many-angled and is highly variable, especially as regards its spinescence. It is a multi-stemmed, and a clump-forming erect shrub, about 1.7m tall. The *stems* are green and slightly glaucous, 12-20-angled; *spines* (modified peduncles) 1-3 from a flowering eye; the tiny *leaves* are rudimentary and are soon deciduous. The *cyathia* are solitary, with dark purple involucres, from each flowering eye. The *seed capsules* are greyish-pubescent.

Distribution: Eastern Cape Province from about Port Elizabeth in the west across to east of Grahamstown and in a wide swath northwards to Cradock.

2.

Euphorbia polygona Haw. var. ***ambigua*** DH Schnabel

Var ***ambigua*** is a dioecious, clump-forming variety, growing up to about 1.5m tall, with many prominent-angled, usually erect, stems which are of irregular length. The *stems* are covered with a thick whitish, glaucous waxy coating, which crumbles away on older stems. The upper stems are armed with sharp rigid spines (peduncles). *Cyathia* are solitary with dark purple involucres. The *seed capsules* are densely whitish to purplish green.

Distribution: Widespread over the Great Karoo from the Little Winterhoek Range, in the south, , across to west of Willowmore, through to about Graaff Reinet in the north.

3

Euphorbia polygona Haw. var. ***anoplia*** DH Schnabel

Var. *anoplia* is a dioecious clump-forming, loosely



Euphorbia polygona var. ***anoplia*** A plant strongly resembling the described variety. In habitat on Coegakop, E. Cape

tufted, little-known variety. The erect *stems* are spineless with acute, shallow angles. The small, soon-deciduous rudimentary *leaves* are borne on the upper stem. The finely pubescent *cyathia* has dark, reddish-purple glands which develop in threes, on or near the apex of old stems.

Distribution: Occurs possibly in the Uniondale district and on Coegakop, north of Port Elizabeth. This variety is of doubtful origin. It is possible that the plant originally described was of hybrid origin.

4

Euphorbia polygona Haw. var. ***exilis*** DH Schnabel

This tall dioecious, fairly thin, variety, forms clumps of erect stems up to about 2m tall. It very rarely branches above the base and then usually as a result of damage to the stem. The *stems* are 7-10 angled. The *spines* (persistent dried flower stalks) are predominately solitary and are produced, with the cyathia along the angles. The *cyathia* are mainly solitary and are dark purple in colour. The pubescent *seed capsules* are whitish to pinkish-white.

Distribution: Found mainly in the Gamtoos River valley, E. Cape

5

Euphorbia polygona Haw. var. ***nivea*** DH Schnabel

This beautiful variety is commonly known as 'Snowflake' because of the powdery, whitish waxy coating of the stems. The plant is dioecious, developing several several *stems*, forming clumps which are







1. ***Euphorbia polygona*** var ***polygona*** in habitat at Hellspoort, near Grahamstown *Photo Detlef H Schnabel*
2. ***Euphorbia polygona*** var. ***polygona*** Bluish form, in habitat near Kirkwood E Cape *Photo Detlef H Schnabel*
3. ***Euphorbia polygona*** var. ***exilis*** in habitat near Hankey, E. Cape *Photo Detlef H Schnabel*
4. ***Euphorbia polygona*** var. ***ambigua*** in habitat near Klipplaat, E Cape *Photo Detlef H Schnabel*
5. ***Euphorbia polygona*** var. ***nivea*** in habitat near Joubertina, E. Cape *Photo Detlef H Schnabel*





irregular in length. The *stems*, which grow up to about 0.9m, are pale green coated with the wax layer. In old age the wax coating crumbles away and the stems develop up to 15 angles, which are sometimes wavy. The *spiny peduncles* (persistent flower stalks) develop from the flowering eye. The *cyathia* are dark purple and the *seed capsules* are densely whitish-purple.

Distribution: E & W Cape Provinces: Kouga Mountains and the Longkloof as well as Baviaanskloof on the W Cape Province border.

6

Euphorbia polygona Haw. var. ***noorsveldensis***
DH Schnabel

Var. *noorsveldensis* is named for the colloquially-named - *Noors*, the Afrikaans vernacular name for euphorbias & '*Veld*' Afrikaaans word for country, and in particular for *E. caerulescens* which is the predominant constituent of a part of the eastern Cape, covering large swathes of the countryside. (See illust. 1&2 which shows the associating *E. caerulescens*). This variety is a dioecious, columnar plant with multiple stems of varying length growing from the base. The *stems* are greyish, bluish-green or bluish-gray and are up to about 2m tall with up to 13 angles. The spiny *peduncles* along the angles are up to 40mm long. The *cyathia* are red to dark purple. *Seed capsules* are grey-purple.

Distribution: N & NE of Jansenville across to east of Kleinpoort in the E Cape

7

Euphorbia polygona Haw. var. ***striata***
Detlef H Schnabel

Var. *striata* is named for the light and dark lateral stripes on the stems. It is a dioecious clump-forming variety, with the stems produced from the base. The *stems* vary in age and length are up to about 1m in height with about 15 sometimes acutely wavy angles. The *angles* are armed with triquitous sharp spines (or persistent dried peduncles). The *Cyathia* are dark red to purple and the *seed capsules* are smooth, grey-brown to grey.

Distribution: In the Steytlerville district on the northern foothills of the Grootrivierberge NW and NE of Steytlerville and the Lesser Winterhoekberge.

8

Euphorbia polygona Haw. var. ***horrida***
DH Schnabel

Var. *horrida* is a rare variety, which is dioecious, clump-forming and branching from the base, rarely above but usually only after damage. *Stems* are glaucous, covered with a white epicuticular wax. The angles, up to 15, are prominent with wavy sides, often with lateral lighter stripes, and crowded with spines. *Spines* 1-5 from each flowering eye, with the central spine longer than the others. *Cyathia* are with green to reddish involucres.

Distribution: This rare variety from some 35km north east of Willowmore in the Witteberg range in the eastern Cape, also NW of Willowmore on the farm Kruidfontein. A small population has been found on the Aasvoëlberg, about 15km N of Willowmore, just W of Perdekloof.

9

Euphorbia polygona Haw. var. ***alba***
DH Schnabel

Var. *alba* is an attractive dioecious multi-stemmed plant forming dense clumps, with erect stems up to about 0.6cm in height. The *stems* are pale bluish green covered with a distinct powdery white epicuticular wax layer. The up to 20 *angles* are slightly wavy and are armed on the upper portions with rigid spines along the angles. The *cyathia* are solitary from each flowering eye and are green to yellowish-green. The *seed capsules* are slightly pubescent, whitish green.

Distribution: Confined to a small area north of Uniondale in the western Cape

Euphorbia polygona var. ***striata*** in habitat iW of Steytlerville, E Cape
Photo Detlef H Schnabel









1. *Euphorbia polygona* var ***noorsveldensis*** in habitat near Jansenville, E Cape
Photo Detlef H Schnabel
2. *Euphorbia polygona* var ***noorsveldensis*** in habitat near Jansenville E Cape
Photo Detlef H Schnabel
3. ***Euphorbia polygona*** var. ***horrida*** in habitat near Willowmore E. Cape
Photo Detlef H Schnabel
4. ***Euphorbia polygona*** var. ***hebdomadalis*** in habitat in the Seweweekspoort, near Ladismith, W Cape
Photo Detlef H Schnabel
5. *Euphorbia polygona* var. ***alba*** in habitat near Uniondale SW Cape
Photo Detlef H Schnabel





10

Euphorbia polygona Haw. var. *hebdomadalis*

Detlef H Schnabel

The name '*hebdomadalis*' is derived from a term denoting 'seven', which refers to the plant's only known habitat, the Seweweekspoort. It is a dioecious, variety which forms clumps of several erect stems, branching only at the base. The *stems* have up to about 17 prominent angles and are up to about 1.4m in length. They are glaucous and blackish-green with a powdery, wax coating the upper stems. They have about 17 prominent *angles* which are heavily armed with many rigid spined (or modified peduncles). The *cyathia* are solitary. These are light to darker green. The *seed capsules* are slightly pubescent and whitish to light green.

Distribution: Confined only to the Seweweekspoort, a few kilometres NE of Ladismith in the W Cape

11

Euphorbia polygona Haw. var. major

Detlef H Schnabel

The variety *major* is a robust, tightly clustering plant with stems growing up to about 1.6m tall, with stems of various age and height. *Stems* are pale to darker green with up to about 21 angles, with densely packed long pungent spines along the angles. The *cyathia* are yellow to green, turning dark purple or brownish with age. The *seed capsules* are densely whitish and pubescent.

Distribution: W and N of Willowmore in the E Cape extending to the plains in the north towards Beaufort West in the W Cape

12

Euphorbia polygona Haw. var. ***minor***

Detlef H Schnabel

Var. *minor* is a small dioecious variety, which forms dense clumps, growing up to about 250mm in height. The *stems* are coated with a thick glaucous whitish waxy powder and the upper parts are armed with dense pungent spines along the about 14 angles of the stems. The *cyathia* are bright green and the *seed capsules* are green with a light whitish pubescence..

Distribution: Occurs on the Rooiberg mountains in the Little Karoo and on the Swartberg mountain range S Cape



Euphorbia polygona var. ***hebdomadalis*** in habitat in the Seweweekspass, NE of Ladismith
Photo Detlef H Schnabel

Euphorbia polygona var. ***major*** in habitat on the farm Kruidfontein, near Willowmore
Photo Robin Frandsen,





Euphorbia polygona var. ***minor*** in habitat near Uniondale, W Cape
Photo Detlef H Schnabel

Euphorbia polygona var. ***alba*** in habitat near Oudtshoorn, W Cape
Photo Detlef H Schnabel

