ALSTERWORTHIA INTERNATIONAL

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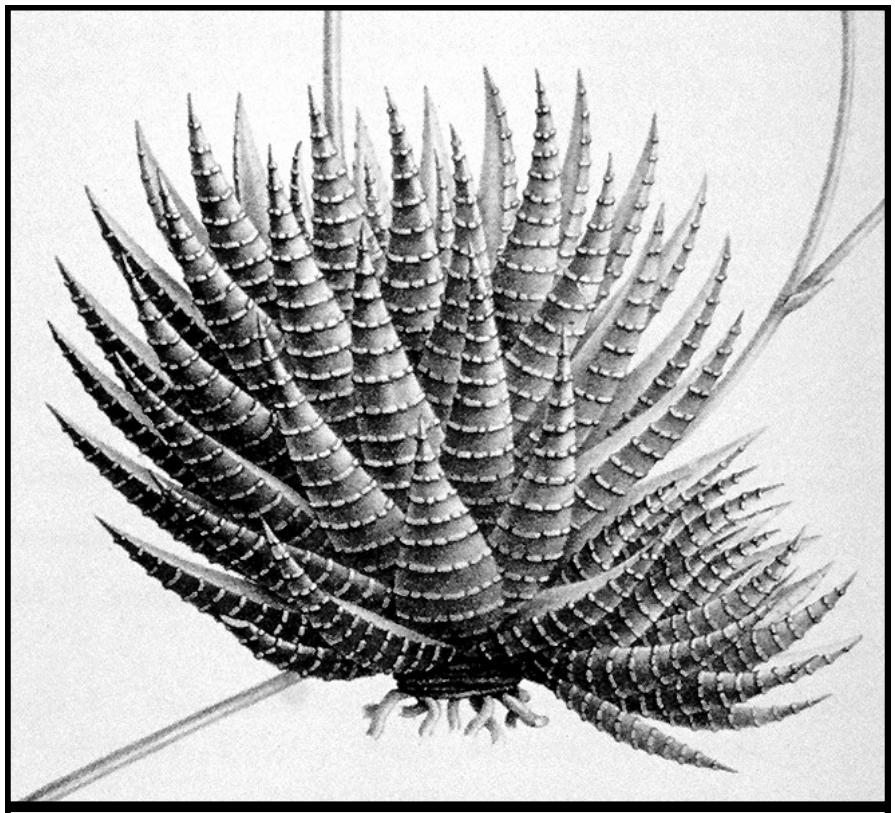
journal



Monogr. Gen. Al. 2: Aloe t. 14 Aloe fasciata Salm-Dyck (1837)

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ALSTERWORTHIA INTERNATIONAL
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A book list will be enclosed with the November issue of Alsterworthia International. It will include *Bulbinella of South Africa* by Pauline L. Perry (please see contents below), approximate price £23.00 + p & p. To save on bank charges etc, books may be ordered with the renewal of subscriptions for 2002. We expect to be able to make a special offer on one of the books for renewals/new members for 2002.

Aloe fasciata (Willd.) Salm-Dyck

The front cover illustration is a reproduction of an 1837 drawing of *Aloe fasciata* by Salm-Dyck published in *Monagraphia Generum Aloes et Mesembryanthemi 2.*

Willdenow originally described this taxon as *Apicra fasciata* in 1811. In 1817 Salm-Dyck transferred it to the then widely accepted and all embracing genus *Aloe* as *Aloe fasciata* (the date 1837 on page 173 of Haworthia Revisited is incorrect), then in 1819 Haworth placed it in his new genus *Haworthia* as *H. fasciata* (Ingo Breuer states that the date 1821 on page 290 of The World of Haworthias Vol. 1 is an error).

Since its inclusion in the genus *Haworthia, H.* fasciata has had a relatively stable existence as a species. Both Bayer and Esterhuizen do not subdivide it, but Breuer and Hayashi subdivide it into *fasciata* and *brownian,* the former classifying them as forms and the latter as varieties.

References:
The World of Haworthias Vols. 1 & 2 by Ingo Breuer
Haworthia Revisited - A revision of the genus by Bruce Bayer.
Alsterworthia International 1(1)15.

Acknowledgement:
From his extensive library, Ingo Breuer has kindly made available a range of drawings published from the eighteen century onwards for use on the front cover of Alsterworthia International. Each issue will have a different drawing with a brief explanatory note.

CONTENTS

All that is known about Black Spot.

If you have ever kept gasterias and/or aloes you will no doubt be acquainted with black spot. Even if you have no personal experience of it, you may well have heard of it in discussion and you may have noted that whilst some people may claim to know what causes it and what should be done to get rid of, or prevent it, facts do tend to conflict and undermine ones confidence in perceived knowledge. Much of what is said is based on (incomplete) empirical evidence; very little science is evident. The proposed causes of black spot range widely. The following is a distillation of views presented by a variety of sources.

Stress is sometimes cited as a factor contributing to black spot. Given that stress weakens a plant and therefore makes it less resistant to pathogens, this seems to be a reasonable line of approach and it may contribute to an explanation of why some plants may be subject to black spot in opposing conditions, hot-dry and cold-damp, both of which can be stressful to the plant, particularly in prolonged periods. However, it does not explain what is causing black spot, only what might be facilitating its development.

Cultural conditions are sometimes proposed as causes of black spot – too much sun and lack of ventilation can result in surface tissues being damaged, feeding with a high nitrogen fertiliser and over watering can result in soft tissue, which is more vulnerable to pathogens, but there is often a lack of consistency in the results with only a few plants being affected. Other growers in the same area experiencing about the same cultivation conditions have indicated that they do not experience black spot.

It is known that deficiencies in soil can cause blemishes in plants *ipso fact* black spot is caused by soil deficiency. This is speculation. Others have pointed out that gasterias which have not been repotted for many years must have depleted nutrients, but they show no signs of black spot, whereas plants in much fresher compost and, therefore, with nutrients have developed black spot.

Glasshouses do not have uniform conditions throughout. Corners, particularly right angled corners, can be damper than the centre, the north side can be damper than the south (opposite way in the southern hemisphere) and under the staging, particularly on the north side, can be much damper and at a lower temperature than above staging and above suspended shelving. You can easily verify this for yourself by installing a series of maximum and minimum thermometers at various points in your glasshouse and recording and comparing the temperatures at different locations at the same time. Air at higher temperatures holds more moisture than air at lower temperatures, consequently plants under the staging are likely to experience more condensation than those at the higher, hotter levels. In one glasshouse a difference of more than 10 Fahrenheit was found between under the staging and on suspended shelving on the north side. Furthermore, condensation lingered longer by two to three hours in the corners compared with the sides and southern end. It also lingered longer on the north side. In the evenings the reverse occurred. Condensation formed in the corners and at the north end two or three hours before it became evident at the south end and sides.

Dampness is frequently proposed as a cause of black spot and claims made that removal of plants to a dryer part of the glasshouse is a reliable preventative measure. A contrast has also been drawn between winter, when it is much damper and the development of black spot has been observed, and summer, when it is much dryer and the development of black spot has not been observed. Unfortunately there is conflicting evidence as some growers have seen the development of black spot in the dry conditions of summer but not in damp winters. One *Gasteria disticha* in its younger days when grown on the staging in the centre of the glasshouse suffered from black spot. In its old age, when it became a large clump and remained in old compost in a tray under the staging for a long time, with less light, cooler conditions, higher humidity and low nutrients, it was free of black spot.

Another popular proposed cause is fungus and, apparently less frequently, bacteria. Perhaps these should be considered together with dampness because fungus and bacteria are known to flourish in damp conditions. However, many gasterias, which are inevitably kept in damp conditions in winter when rain, cloud cover and short days maintain a high atmospheric humidity for long periods without any significant sun, do not develop black spot, whereas plants in the summer with long day length and clear sunny skies and much lower humidity do.

The suggestion has been put forward that some gasterias are naturally prone to the development of black spot and others are not, but reports from different people do not support an agreed list of species which are, and which are not, prone to its. Furthermore, some cultivators have found that only one plant of a species has developed black spot whilst others of the same species have not. Perhaps even more revealing is the observation that, where a large plant has been split into several individuals, observation of their progress over a number of years has revealed that only one or two have developed black spot, the majority of the same clone having remained free from it. Black spot does not seem to be contagious and rampant.

Does black spot occur in habitat? One visitor, who has made several excursions to South Africa, reported that he had rarely seen black spot on the *Gasteria* species he had observed west of the Eastern Cape and then north to the Orange River. In one year a few black spots were observed on *Gasteria pillansii* in the Hells Kloof area when it had been exceptionally dry for several months.

On another occasion, in the same area in an exceptionally wet year, leaves of *G. pillansii* were highly turgid, some were splitting and some showed signs of rot, but black spot was seen only occasionally

In the search for more authoritative information David Cumming, who has made many field trips in South Africa, was contacted. He says that black spot "appears to be widespread and common, especially in the Eastern Cape. Astrolobas seem the most 'infected' followed by gasterias. It seems to me to be stress related, just as many diseases are in humans, which leads me to think that it may be an opportunistic pathogen rather than a primary cause of disease. In cultivation many of my gasterias that were more neglected than others displayed black spot, but on now receiving better care have recovered."

Earnst van Jaarsveld indicated that black spot is caused by a fungal disease, by a *Montagnella* species, which is common all over South Africa. As a preventative measure he sprays every 3 to 6 months with copper oxichloride or Captan, but notwithstanding regular spraying some plants still get some spots.

A study of *Montagnella* was carried out in South Africa some years ago, but it was never published. The report of the study must be lurking somewhere on the shelves of a university or botanical garden, but all attempts to locate it (and the author) have failed. Unfortunately not all important information is published for the benefit of a wider audience.

Doug McClymont of Zimbabwe was also consulted. "My experience has been with aloes and as a semi-hobby, not as a full time researcher, so I have no replicated experiments to quote, all my recommendations coming from personal observation and a suck it and see philosophy!

"The black spots I have dealt with have proved to be a minefield in many ways. Perhaps some of my general observations may be of use. The black spots on aloes generally develop in high humidity conditions, overcast, temp minimum > 18 deg. C, rain every day etc., but also when there has been a significant insect (especially Mirid) attack and even more confusing only on senescing leaves on some cultivars?! We get two main types of leaf spot, but their epidemiology has never been researched. The two types are: *Montagnella maxima* Mass. and *Placoasterella rehmii* (P. Henn) Theiss & Syd. Certainly I have experience that these are not controlled by systemic fungicides such as benzimidazoles or triazoles as I have an excellent granule mix of cyproconazole and disulphoton that ensures season long control of rust and all sucking pest and, surprisingly, including mirids who just eat the waxy cuticle of the leaves. I definitely get markedly less black spot with this annual treatment, but I am sure that this does not actually control the black spot per se, but the mirids who injure the leaf. These injuries are then colonised by the black spot organisms. So, no injuries less black spots. However, insects or not, under very moist conditions the spots come booming back and the only success I have had is with copper oxychloride or cupric hydroxide sprays. Wettable sulphur does have an effect, but not as good as the copper. The senescing effect is marked and I am sure triggered by some metabolic change. The lower leaves senesce and the black spot overwhelms them irrespective of spraying which is a real pain when trying to exhibit a show entry. I am sure there is some relationship there, perhaps extra ethylene production in the leaf on senescence, which is perfect for the spot, I don't know.

"What I do know is keep the insects off, spray regularly with copper in very wet conditions and the black spot is markedly less. In drought seasons it may disappear almost completely. I am afraid I haven't really answered your queries and I don't have any rigorous scientific replicated data to supply, but I trust my observations over the last 23 years on aloes may be of some help."

In an attempt to obtain some scientific evidence the Plant Pathology Division of the Royal Horticultural Society was contacted.

Leaves of *Gasteria disticha* with black spot on both sides, samples of the roots and the soil in which they were growing were sent to them to see if they could establish the cause of the black spot. They carefully examined the material and concluded that the spots were not the result of cultural practice such as the amount of sunlight, watering and feeding. They incubated areas of tissue around the black spots, but were unable to isolate any fungal or bacterial pathogens; they did add that the isolation of bacterial and fungal pathogens was difficult. They also carried out a search of the literature for diseases in Europe, but were unable to find any information on *Montagnella* species, presumably because it is not a factor in Europe. The best suggestion they could offer was to use the fungicide mancozeb, which is available in garden centres as Bio Dithane 945, as it had proved effective in controlling leaf spotting in a wide range of plants.
It is worth bearing in mind that for some people black spot does not develop on their plants, notwithstanding their cultural conditions may not be quite up to the standards conceived as being ideal for the prevention of black spot. "I find black spot to be rare in my greenhouse in spite of damp conditions in winter and poor air flow because vents have to be kept closed to isolate the interior from the low outside temperatures." "I never get Black Spot and grow all my *Gasteria* in shade."

So where does all this leave us? The conflicting information from growers does suggest that there is no one set of conditions under which black spot develops. The causes of black spot appear not to have been finally established, but many perceive that fungi are the culprits though fungicides seem to do no more than control them; they do not eliminate them. Stress would also seem to be an important factor. Good husbandry may be the best preventative measure, which means

(Continued on page 5)

Book Review of 'Bulbinella in South Africa' by Pauline L. Perry. Strelitzia 8. National Botanical Institute, Pretoria. ISBN 1-919795-46-4.

Paul I. Forster, P.O. Box 2171, Ashgrove West, Queensland 4060, Australia

Bulbinella Kunth is a small genus of Asphodelaceae that naturally occurs in South Africa and parts of New Zealand (six species). Together with the genera *Asphodelus* L., *Asphodeline* Rchb., *Bulbine* Wolf, *Eremurus* M.Bieb., *Jodrellia* Baijnath, *Kniphofia* Moench. and *Trachyandra* Kunth, they comprise the subfamily Asphodeloideae of this family.

This issue of 'Strelitzia' covers seventeen species of *Bulbinella* that are recognised to occur in South Africa and is the published results of a M.Sc. thesis by the author. It follows on from the synoptic review published by the same author in 1987 (Perry 1987), but includes some re-alignments of taxa and the description of new subspecies and species. The different species of South African *Bulbinella* are, at the best, fleshy leaved rosulate, geophytic herbs that are generally to be found in areas of seepage or damp soil. Restricted to the winter rainfall region of South Africa, all of the species become dormant during the dry summers and much of the top growth is shed or lost.

This is very much a standard, taxonomic revision of a neglected group. It opens with sections on a general introduction, historical information, family and generic relationships, general morphology, vegetative reproduction, seedling development, pollination biology and geographical distribution and ecology. There is also a chapter on cultivation with comments on species recommended for cultivation. Plants are suitable for rockeries or pots in areas with a winter rainfall if grown outside.

The bulk of the issue comprises a well illustrated taxonomic account of the individual species. Fourteen species are illustrated with a full page colour painting showing the plant form, inflorescence and details of the flowers. These rather nice paintings are the work of Jeanette Loedolff. As well there are six colour photographs of plants in habitat. Each species is supplied with a detailed description, details of types, comments on distribution (including a dot map) and habitat, a list of diagnostic features, nomenclatural notes and list of herbarium specimens examined. New taxa described or new combinations are *Bulbinella latifolia* Kunth subsp. *denticulata* P.L.Perry, *B. latifolia* subsp. *doleritica* (P.L.Perry) P.L.Perry, *B. latifolia* subsp. *toximontana* P.L.Perry, *B. nutans* (Thunb.) T.Durand & Schinz subsp. *turfosicola* (P.L.Perry) P.L.Perry and *B. potbergensis* P.L.Perry. Perhaps only *B. gracilis* Kunth could be considered to have succulent foliage and most species are unlikely to be of interest to succulentophiles. Despite this, they are attractive little plants and should be considered as 'companion plants' in rockeries or glasshouse collections of succulents.

Reference

Perry, P.L. (1987). A synoptic review of the genus *Bulbinella* (Asphodelaceae) in South Africa. South African Journal of Botany 53: 431-444.

(Continued from page 4)

growing plants hard in the growing season with plenty of moving air, good light, but not necessarily full sun, adequate water and nutrients for growth and repotting as dictated by growth. This should result in a "hard" plant which is better protected from insects and any pathogens the damp, dormant period can throw at it. It should help considerably to keep the floor, staging etc clean at all times and the plants dry during dormancy and during dull, cold, damp weather. From hereon you are on your own. Conditions do vary from year to year so these alone could influence the occurrence of black spot more than the removal of a plant from one position to another in the same glasshouse. Careful observation over a number of year will be necessary to come to any reliable conclusions.

Acknowledgement, with appreciation, of information received for incorporation into this article from:
1. A number of growers in different countries.
2. David Cumming, South Africa.
3. Ernst van Jaarsveld of the National Botanic Gardens, South Africa.
4. Doug McClymont, Zimbabwe.
5. Dr. A. J. Jackson, Plant Pathologist, Royal Horticultural Society.

Variability within and between species. Part 2.

The meaning of morphological features for further taxonomic studies

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B.5 *H. scabra*

In the subgenera Hexangulares and Robustipedunculares there are no bristle and hair-like structures, but there are ± prominent, large tubercles which can be translucent or concolorous with the leaf colour or ± white. The tubercles can be well separated and irregularly arranged, or arranged in horizontal or vertical rows, sometimes connected to horny lines. *H. scabra* is an example of a leaf surface with irregularly arranged concolorous tubercles ranging in size from rather large to small. Figs. 1 & 2 page 8.

B.6 *H. longiana*

This species, not named after its very long leaves, but after the collector F.R. Long, is another example of a species with tubercles, but with a change of tubercle colour from green to white. Figs. 3 & 4 page 8.

B.7 *H. attenuata* var. *radula*

In *H. attenuata* var. *radula* are two forms, one with a higher density of more prominent, white tubercles and another with a lower density of smaller tubercles. Figs. 5 & 6 Page 8

B.8 *H. marginata*

Within this taxon of the subgenus Robustipedunculares, there is variation from completely glabrous and green plants, through forms with horny whitish margins, to grey-green coloured plants with whitish-tubercled margins, keels and back. Figs. 7 & 8 page 8.

B.9 *H. fasciata*

This 60 year old photo clearly shows a tubercled and a glabrous form of *H. fasciata* f. *variablis*. These forms are known also from recent records of this species.

B.10 *H. limifolia.*

In *H. limifolia* there is impressive variation in leaf colour and surface, from the pale, grey green form (*H. limifolia* var. *ubomboensis* [IB6752]); through an intermediate form with some tubercles and somewhat greener leaf colour [IB682], a large growing form with green leaves, tubercled in vertical rows (*H. limifolia* var. *gigantea* [IB5652]) and a smaller form with very prominent whitish horny lines [*H. limifolia* var. *striata* [IB6676]; to a black-brown-green leaved form with connected tubercles arranged in horizontal horny lines (*H. limifolia* var. *gideonii* n.n. [IB692]). Figs. 9-13 page 8.

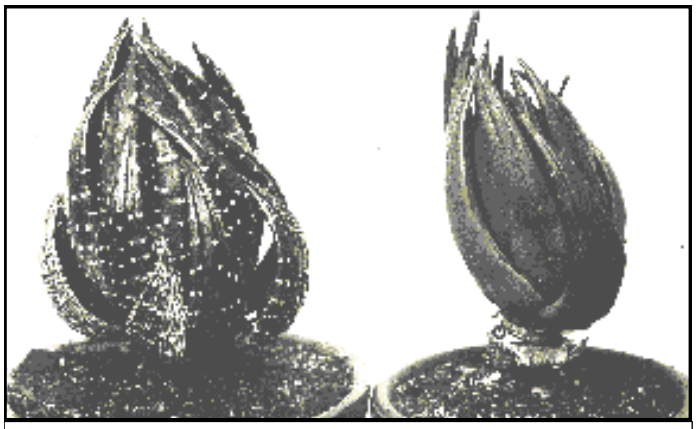
B.11 *H. viscosa*

We can recognise a remarkable difference in the size of leaves within this taxon, as well as all shades of ± green leaf colours and all types of smooth and rough leaf surfaces, but also remarkable is the arrangement of leaves, which may be trifarious or multifarious as shown by the last two pictures of this sequence. Figs.16-20 page 9.

C. Variation in leaves versus flowers

H. globosiflora* & *H. pehlemanniae

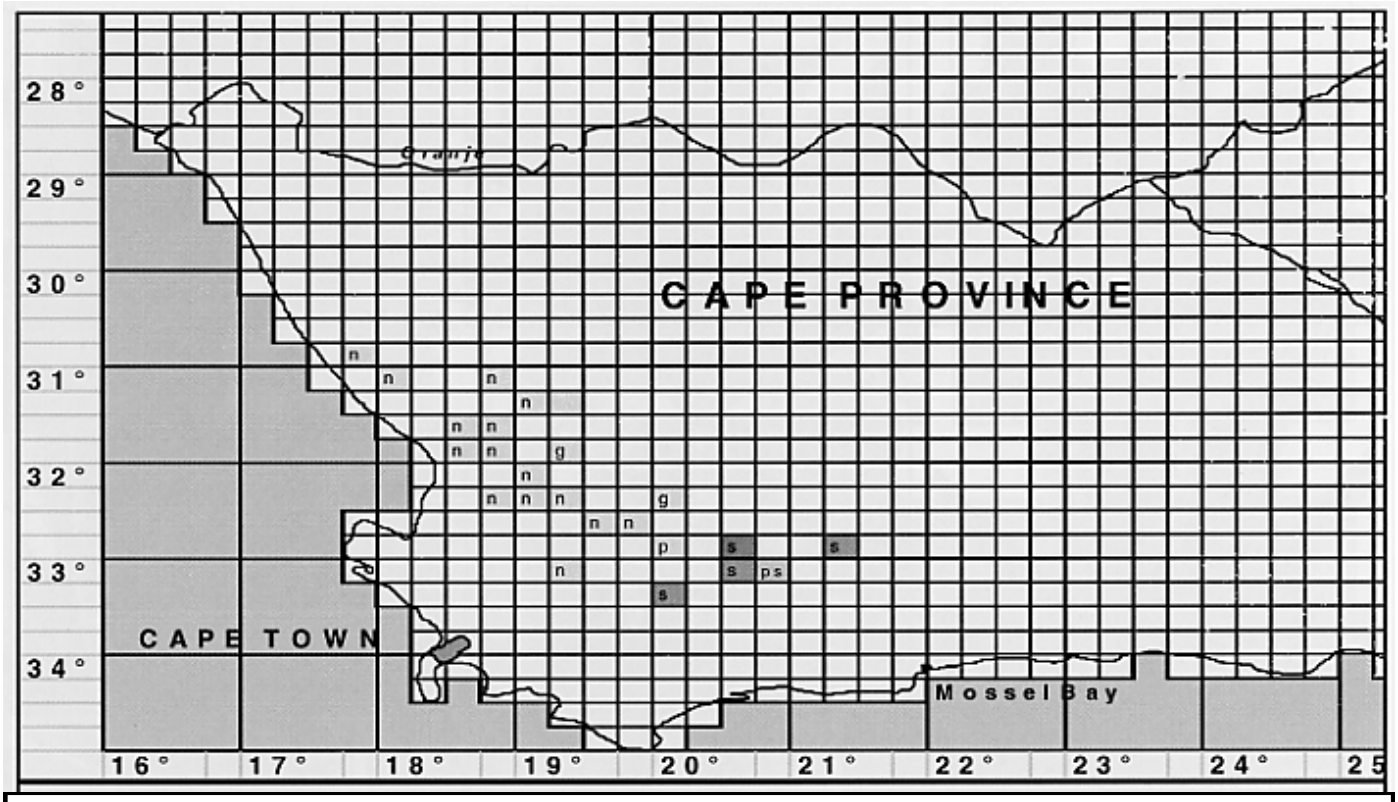
If you look only at the pictures below of the very similar flowers of these two taxon (both with a slightly globose base) you might expect to see two rather similar looking plants and may be very surprised to find that the two are different, as shown in Figs. 14 and 15 on page 8. In both *H. nortieri,* which has a non-globose flower, and *H. globosiflora* the margins and keels bear ± long fine teeth and also on the surface. There are also pellucid flecks. In



H. fasciata f. *variabilis* (B), undated
Long 443 Elands River Road [3324DB] Lectotype

Haworthia globosiflora IB2839
N. of Laingsburg [3320BB]

Haworthia pehlemanniae IB2837
Bo-Visrivier, W of Sutherland



Map 3. Locations of *Haworthia nortieri, H. globosiflora, H. pehlemanniae* and *H. arachnoidea* var. scabrispina.
Legend. n = *H. nortieri.* g = *H. globosiflora. p = H. pehlemaniae.* s = *H. arachnoidea* var. *scabrispina*

normal flower	globose flower		normal flower
leaves ± small teeth, but with ± pellucid flecks		leaves strongly setose, but without pellucid flecks	
H. nortieri	*H. globosiflora*	*H. pehlemanniae*	*H. arachnoidea* var. *scabrispina*

Table 1.
Representation in tabular form of the connections between the four taxa in terms of flower and leaf characteristics

H. nortieri there are rather few, but in *H. globosiflora* they can become very numerous at the tip, making it appear very translucent. The habit and the setose leaves of *H. pehlemanniae* and *H. arachnoidea* var. *scabrispina,* which also has a non-globose flower, appear very similar and there are no pellucid flecks to be found.

Map 3 presents the recorded locations of the 4 taxa and their geographical relationships. Up to now, there is no explanation for the development of the globose flowers. Maybe in the distribution area of the two globose flowered haworthias a specialised pollinator occurs and this flowering type is an adaptation to it. Field observations at flowering time are needed for a solution to be found.

All photographs by the author.

Aloes - Africa's pride

The following note by Leigh Niewoudt of Simply Indigenous Nursery was published in the Gisa* Newsletter for June, 2001 under the above heading.

Aloes are gaining popularity in both corporate and domestic landscaping. They used to be classified as part of the lily family (tulips, true lilies etc) but are now grouped with their close relatives, the red hot pokers and bulbines in the family Asphodelaceae. There are about 350 species in the world. South Africa boasts 125 species. Aloes are distributed all over Africa, Arabia, Socotra Island and Madagascar. The Madagascan aloes evolved quite differently from other African aloes. There are no grass aloes or aloes with horizontal flowers in Madagascar, but most are scented. South Africa has only one scented Aloe, namely *Aloe modesta*, a grass aloe.

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http://www.gisa.co.za/pages/library_archive/aloe.html

Fig. 1. *Haworthia scabra.* IB5351
5 km SE of Oudtshoorn [3322CA]

Fig. 2. *Haworthia scabra* IB514
Schoemanskloof, N of Oudtsoorn [3322AC]

Fig. 3. *Haworthia longiana* IB5699
Draagtekloof, beside Gramtoos River [3324DD]

Fig. 4. *Haworthia longiana* IB5148
Draagtekloof farm, 10 km S of Patensie [3324DD]

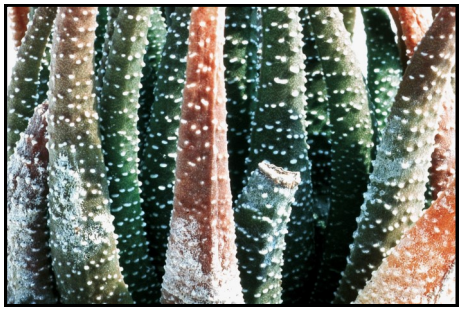

Fig. 5. *Haworthia attenuata* v. *radula* IB376
Patensie [3324DD]

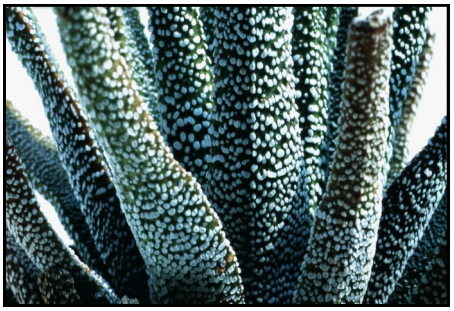

Fig. 6. *Haworthia attenuata* v. *radula* IB5404
NE of Hankey [3324DD]

Fig. 7. *Haworthia marginata* IB6024
E of Riversdale [3421AB]

Fig.8. *Haworthia marginata* IB885
Dreo [3421AA]

Fig. 9. *Haworthia limifolia* v. *ubomboensis*
IB6752. 3 Sisters, Barberton [2531CB]

Fig. 10. *Haworthia limifolia* IB682
Barberton [2531CC]

Fig. 11. *Haworthia limifolia* v. *gigantea* IB5652
Nongoma, TL [2731DA]

Fig. 12. *Haworthia limifolia* v. *striata* IB6676
Hluhluwe [2731DA]

Fig. 13. *Hawortia limifolia* v. *gideonii* n.n. IB692
10 km E of Pongola [2730BC]

Fig. 14. *Haworthia pehlemanniae* IB2839
Bo-Visrivier W of Sutherland [3220AD]

Fig. 15. *Haworthia globosiflora* IB2837
N of Laingsburg [3320]

Fig. 16. IB55 N of Koup Station, NE Laingsburg[3321AB]

Fig. 17. IB5725. Near Sandvlakte farm, Studis

Figs. 16-19
H. viscosa

Fig. 18. IB5667
SW of road to Floriskraal Dam

Fig. 19. IB284
10 km NE of Patensie, TL [3324DD]

Fig. 20. *Haworthia viscosa* IB4636
Sandvlake farm, Stidios [3324CA]

Fig. 21.
Haworthia koelmanioorum, Maleoskop

Fig. 22.
Haworthia koelmaniorum, near type loclaity

Fig. 23.
Haworthia koelmaniorum, Haworthia limifolia, *Haworthia venosa*

Fig. 24.
Haworthia koelmaniorum, near type locality

Fig. 25 Left

Haworthia magnifica
Riversdale
IB278

— — —

Fig. 26
Right.
Haworthia pygmaea
Great Brack
IB 331

Notes on Haworthia asperula (Haw.)

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Introduction

Ingo Breuer's new book, *World of Haworthias Vol. 2*, provides some interesting information about described species. One such species is *H. asperula,* a species recognised by Scott, in which Scott includes a few of Bayer's species, including *H. pygmaea*, as synonyms. Bayer does not recognise *H. asperula*, but he has expressed his views on this plant. *H. asperula* is one of the earliest described species and it has been recognised by Haworth, Salm-Dyck, Baker, Berger, Von Poellnitz and Jacobsen over a period of 125 years.

The two species with which *H. asperula* is generally associated are *H. pygmaea* and *H. magnifica.* The purpose of this article is to reconstruct what has already been written about *H. asperula* and to compare the information with the application of the name *H. asperula* by the Haworthia public.

Description of *H. asperula*

Haworth (Decas Secunda Novarum Plantarum Succulentarum; Philosophical Magazine and Journal 64:300, 1824).

Similar to *H. retusa*, but leaves dirty green, partly retuse and covered with scattered granules and about ten paler lines, not five as in *H. retus*a. Leaf margins and the apex of the keels are minutely ciliate or denticulate, hairs green.

Baker*:* Leafy stem very short; rosette 63-75 mm Ø; leaves 10-12, multifarious, deltoid, very recurved, 25-38 mm long, 18 mm broad, 8-12 mm thick in the centre, pale green on both sides, scabrous on the face, with minute concolorous papillae and marked in the upper half with 7-9 vertical pale green lines, rounded and smooth on the back and keeled in the upper half; peduncle slender, simple; raceme lax, few-flowered; pedicels very short; bracts minute, deltoid; perianth 15 mm long limb a third to half as long as the tube.

Background

All the widespread retused species in the area Caledon to Riversdale had been described by the time *H. asperula* was described during 1824: *H. retusa* in 1753, *H. mirabilis* in 1804, *H. turgida* in 1819 and *H. mutica* in 1821. The large and widespread *H. magnifica* complex and *H. pygmaea* complexes were only described about 110 years later. *H. magnifica* was described in 1933, *H. magnifica* var*. maraisii* in 1935 and *H. magnifica* var. *atrofusca* in 1948. *H. pygmaea*, a more localised species, was even described prior to the widespread *H. magnifica* during 1929.

H. magnifica var. *atrofusca* (*H. atrofusca* as described by Smith) is growing more or less in a straight line from about 15 km east of Riversdale to about 15 km west of Heidelberg. The interesting thing is that the plants from west of Heidelberg and east of Riversdale look exactly the same although larger forms are found in between. *H magnifica* var. *magnifica* (*H. magnifica* as described by von Poellnitz) is found both north and south of the main stream of *H. magnifica* var. *atrofusca* and sporadically enters the main stream of *H. magnifica* var. *atrofusca*, which makes it extremely difficult to distinguish between the two varieties. It is clear that the distribution area of *H. magnifica* is quite large with the var. *magnifica* found on the lower hills area, which are much easier to utilise for agricultural purposes. When *H. asperula* was described in 1824 the towns of Riversdale and Heidelberg did not even exist. Riversdale was founded in 1839 and Heidelberg in 1855. Most surely, *H. magnifica* var. *magnifica* was even more widespread in the early 1800's when the area was not that developed for agricultural purposes.

Haworthia magnifica/Haworthia asperula

When Von Poellnitz described *H magnifica* he wrote in his additional notes **"**Distinguished from *H. asperula* Haw. immediately by, among other things, much smaller numbers of lines on the retuse leaf surface,….".

Bayer in comments on *H asperula* in Haworthia Revisited states that "…….. von Poellnitz applied the name to plants from Great Brak (= *H. pygmaea*), Bonnievale (= *H mutica*), Zebra (= *H. emelyae*), Uniondale (= *H. bayeri)* and Barrydale (= *H. magnifica*)" and "Paler, scabrous forms of *H. retusa* are found in the Riversdale area which can just as easily be matched to Haworth's description (of *H. asperula*) as any of the other names mentioned above. Serious thought was given to using the name (*H. asperula*) over *H. magnifica* of Von Poellnitz, but the history of the name gives it little credibility".

In Aloe 12(3) 1974 Bayer wrote "In the writer's opinion, the affinity of this species (*H. magnifica*) should be sought in '*H. asperula*' fide Scott" and he also published a photograph of a plant collected less than a kilometre west of the locality for *H. geraldii*. The same year in Cactus & Succulent Journal (U.S.) he wrote referring to the same plant "About 200 meters to the west (of *H geraldii*) is a smaller population of another plant which appears to have some affinity with *H. asperula* (Synonymous with *H schuldtiana*?). Bayer now includes this plant (growing near H. *geraldii*) under *H. magnifica,* a view that I support after visiting about 30 different

localities of *H. magnifica* in the Heidelberg/Riversdale area. Fig. 25 page 9.

In *The Genus Haworthia* Scott regards J. Dekenah 6a, a plant collected less than a kilometre west of the locality for *H. geraldii*, as typical of *H. asperula* as it seems to agree in all respects with the original description. Also Dr. Hayashi wrote in Haworthia Study No. 3 page 10, also referring to the same plant "This plant is not *H. magnifica.* The correct name of this plant may be *H. asperula*." He confirmed this view in his classification published in Haworthiad. Neither Scott nor Hayashi regard this plant as *H. magnifica* although this is the same plant to which Bayer is referring in the previous paragraph.

Haworthia pygmaea/Haworthia asperula

When von Poellnitz described *H. magnifica* he wrote in his additional notes "Distinguished from …..…. *H. pygmaea* Poelln. by the longer and narrower retuse leaf surface and the presence of lateral short lines".

In relation to *H. pygmaea* Brown wrote "This neat little *Haworthia* (*H. pygmaea*) of the § *Retusae,* Haw. is near *H. asperula* Haw. from which it differs in its much smaller size and the fewer lines on the leaf faces".

Pilbeam, referring to *H. asperula*, wrote that "apart from an illustration in Salm-Dyck's Monograph near to *H. emelyae*, and a tendency to apply this name to larger-growing plants of *H. pygmaea*, there has been little real idea of its application." Also "The very papillose form (of *H. pygmaea*), usually seen in collections labelled *H. asperula*, is referable here, and is maintained as a form of the species (H. pygmaea)". Fig 26 page 9.

It seems that the name *H. asperula* is generally associated by Haworthia collectors with the vary papillose form Pilbeam regards as *H. pygmaea.* E-mail discussion group communications seem to confirm this. Kent wrote in Haworthiad Vol. 6 No. 3 that "I note, more in anger than in sorrow, that some plant persons here, perhaps forming their own school of taxonomy, have used a mixture of Scott and Bayer, applying *H. asperula* to all *H. pygmaea* while following Bayer for the other species Scott includes in his *H asperula* complex".

Conclusion

The only plant that has all the under mentioned characteristics associated with *H. asperula* is the plant currently known as *H. magnifica* and I, therefore, see *H. magnifica* as synonym to *H. asperula*. *Haworthia asperula* must be seen in the context of what is growing in the Heidelberg/Riversdale area under *H. magnifica. H. asperula* comes within the range of variability of *H. magnifica*. *H. asperula* was described prior to *H. magnifica*.

Description:

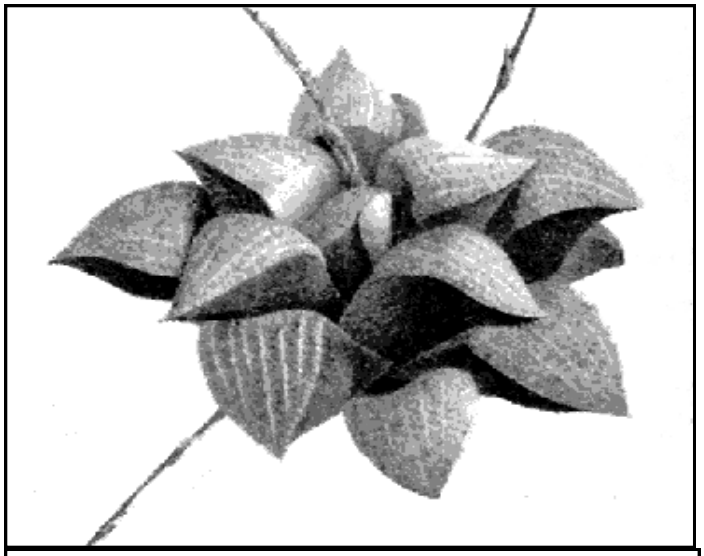
Similar to *H. retusa*
Leaves dirty green
Leaves partly retuse
Leaves covered with scattered granules
About ten pale lines, (not five as in *retusa*)
Margins, keel and apex of the leaves mostly small ciliate or denticulate, hairs green.

Salm Dyck illustration:

longer face lines
very pointed leaves
the flower is that of H magnifica

Acknowledgement

Ingo Breuer for allowing me to use his photographs.



Aloe asperula Salm-Dyck 1836
Monagraphia Generum Aloes 2: Aloe t.19

Succulent Flora of Southern Africa, Revised Edition (2000) by Doreen Court.

A.A.Balkema/Rotterdam, pp. i-xii, 1-300

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A lot can happen in 20 years. This is certainly the case with respect to knowledge of the diversity and classification of the southern African flora. Doreen Court's first edition of this book was published in 1981 and was deservedly popular at the time. The author has updated many things in the new edition, but the basic concept of a concise account (with selected illustrations) of the major groups and species remains the same.

This book covers the genera and selected species of succulent Mesembryanthemaceae (usually given as a synonym of Aizoaceae these days), Portulacaceae, Crassulaceae, Euphorbiaceae, Apocynaceae s.s., Passifloraceae, Stapelieae (should be Ceropegieae) and Aloaceae (should be Asphodelaceae) as they occur in southern Africa. Whilst there is no definition of southern Africa (I guess we should know by now!), there are a couple of maps in the front, one mainly depicting South Africa, and parts of Botswana, Namibia, Zimbabwe and Mozambique, and the other parts of Angola, Namibia, Botswana, Zimbabwe, Zaire (now Democratic Republic of Congo), Tanzania, Malawi and Mozambique. For those who don't know, southern Africa (as defined in the series 'Flora of Southern Africa') is considered to comprise South Africa, Lesotho, Swaziland, Namibia and Botswana. So the book is mistitled because there is considerable coverage of species from nations to the north of southern Africa. As the author does not introduce the work in any manner (i.e. scope, geographical coverage, what is a succulent), it is unclear just what is intended and to some extent it appears to have been constructed in an idiosyncratic and haphazard manner.

There have been a number of important papers and publications dealing with the southern African succulent flora (viz. van Jaarsveld 1987; Smith et al. 1997, 1998; van Wyk & Smith 1996), yet strangely these are not mentioned at all, despite the revised text being stated to having been written after September 1998. The book would have benefited greatly from an introductory chapter outlining the full range of succulent plant diversity in the region and just what defines a succulent plant. Some notes on cultivation would also have been useful for novices. Despite a plea for conservation in the preface, there is no comprehensive comment or analysis on conservation of this flora and a book such as this could have provided a suitable vehicle for some educational material.

With respect to the Aloaceae account, this is comprehensive, but probably can be construed as being little more than a summation of the recent works on *Gasteria* by van Jaarsveld (1994) and *Haworthia* by Bayer (1999) and due respect for the monumental works on Aloes by Reynolds (1950, 1966). Strangely the populist book on *Aloe* by van Wyk & Smith (1996) is not mentioned. Most of the recent changes to *Aloe* synonymy undertaken by Glen and Hardy as precursors to their 'Flora of Southern Africa' text (Glen & Hardy 2000) are included, although not some of the more radical ones only recently published in the said account. The recent combination of *Poellnitzia rubriflora* under *Astroloba* by Manning & Smith (2000) was also too late for inclusion of a comment. The account of *Astroloba* s.s. continues to be unsatisfactory due to the lack of a worthwhile revision.

There has been little change in production of the new edition, with the colour still printed in blocks and some black and white pictures scattered through the text. One improvement is the sturdy colour cover, as opposed to the loose dust jacket on the earlier edition. The Balkema publishers continue to produce rather old fashioned, although useable books, and there is no major visible change in type face or layout to the earlier edition. While some photos from the earlier edition are repeated, there are many new ones and also more of them. In general the photos are satisfactory, although some are out of focus (e.g. *Adenium boehmianum*, *A. multiflorum*). It is pleasing to see additional colour photos of aloes, haworthias and gasterias in this version. I was particularly thrilled to see Peter Bruyn's photo of *Aloe corallina* included, and there are other photos of rarely seen plants to be discovered.

Another annoying feature of the book is the minimalist citation of very selected literature. Admittedly these were not included at all in the first edition. While not as badly presented as those in the 'Cactus File Handbook' series (which are really abysmal), much of the extensive literature on the subject remains obscure from reading this book. A comprehensive listing of literature such as in Smith et al. (1997) would have been most useful to readers with a quest for further knowledge.

For those after a 'potted' account of the southern African succulent flora, this book will still provide a nice overview in one spot. Perhaps with a little more thought as to layout and content it could have been a really excellent one.

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(Continued on page 13)

Bulbinella - a synopsis

Bulbinella is a genus of deciduous geophytes belonging to the subfamily Asphodeloideae of the Asphodelaceae family as defined by Dahlgren et al 1985.

They range in height from about 0.2-1.2 m. high and have compact underground stems from which numerous swollen roots arise. The leaves are produced annually, dying down at the end of the growing season. There is a degree of succulence in the leaves of some species.

Usually there is only one simple, dense, unbranched raceme of flowers in each season, but with plentiful watering in cultivation two or three inflorescences are possible. The 50—500 flowers are usually tightly packed and mature progressively up the inflorescence. The flowers are most commonly yellow, but white tepals with a pale pink midrib and pink buds are also frequent. Cream-coloured flowers with brownish or greenish buds and, more rarely, orange flowers are also found.

In South Africa, *Bulbinella* is confined to the winter-rainfall area of the Cape where it is concentrated towards the west coast, becoming less frequent northwards and eastwards. The growing season of most species is the coolest and wettest time of the year from April to September. Plants remain largely dormant through the dry summer.

Most of the 17 South African species are worth cultivating. The six subspecies and three species with two distinct colour forms, together with a range in size of plants, give scope for selecting a plant for a variety of situations. Because all the South African species are winter-growers, they are not suitable for outdoor situations in frost-prone areas, but could do well in a cool greenhouse.

Propagation is best accomplished by seed. Seedlings that have had the space and suitable conditions to develop well in their first season, may produce flowers in the second year, certainly by the third year. After a number of years some plants may have developed into good-sized clumps and can then be divided.

The taller species of *Bulbinella* are most suitable for garden cultivation where they can be included in a herbaceous or mixed border. They are also the most useful species for cut flowers. The smallest of the species could be grown in a rock garden or in containers.

South African species

Bulbinella barkerae P. L. Perry
Bulbinella cauda-felis (L.f.) T. Durand & Schinz
Bulbinella chartacea P. L. Perry
Bulbinella ciliolata Kunth
Bulbinella divaginata P. L. Perry
Bulbinella eburniflora P. L. Perry
Bulbinella elata P. L. Perry
Bulbinella elegans Schltr. ex P. L. Perry
Bulbinella gracilis Kunth
Bulbinella graminifolia P. L. Perry
Bulbinella latifolia Kunth
- subsp. denticulata P. L. Perry
- subsp. doleritica (P. L. Perry) P. L. Perry
- subsp. latifolia
- subsp. toximontana P. L. Perry

Bulbinella nana P. L. Pery
Bulbinella nutans (Thumb.) T. Durnad & Schinz
- subsp. nutans
- subsp. turfosicola P. L. Perry

Bulbinella potbergensis P. L. Perry
Bulbinella punctulata Zahlbt.
Bulbinella trinervis (Baker) P. L. Perry
Bulbinella triquetra (L.f.) Kunth

Reference and acknowledgement of source:
This text is adapted form Bulbinella of South Africa by Pauline L. Perry

(Continued from page 12)

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Haworthia koelmaniorum (Oberm. & Hardy) and *Haworthia mcmurtryi* (Scott) Mpumalanga's contribution to the Genus Haworthia

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Introduction

Sensational was the discovery of *H. koelmaniorum* during 1963 (described 1967) followed by the discovery of *H. mcmurtryi* during 1983 (described 1984). When considering these two species, two questions come to mind: How is it possible that two such widespread species were only discovered so late? and, What is the relationship between the two species and with other *Haworthia* species?

Although living for almost 15 years in Mpumalanga, the author had never made an attempt to explore *H. koelmaniorum* or *H. mcmurtryi* habitats, even less to explore their possible relationships with other species such as *H. limifolia.* The fact that a good friend, Johan Bronkhorst, retired and settled near Loskopdam, made the author decide to explore the area from south-west of Loskopdam up to Maleoskop, north-east of Groblersdal, during the Autumn and Spring of 1997. The massive hills (almost mountains) and the distance from the main distribution area of *Haworthia* posed a real challenge.

Background

S.J. Crous wrote in an article published in Aloe during 1984 that Dave Hardy told him how he got to the type locality of *H. koelmaniorum*. It was during a Succulent Show in Pretoria that a young girl showed him a *Haworthia* in a pot. The plant had been grown in shade and it was, therefore, very large with a greenish colour. When he heard that the plant came from Groblersdal he was even more sceptical. Nevertheless, he and Me. Obermeyer went a few weeks later to Groblersdal and to their surprise they found the plant in its natural habitat.

H. mcmurtryi was discovered by Mr Douglas McMurtry years later. Although sensational, it was not unexpected to find other haworthias in the area after the discovery of *H. koelmaniorum.*

Present views on these two species' relationship to other haworthias are largely based on hypothesis with little field support. Dr Hyashi is of the opinion that *H. koelmaniorum* may have a relationship with *H. venosa*, especially with the large form of *H. venosa* found at Postmasburg. Bayer relates *H. koelmaniorum* to *H. limifolia***,** as does Scott (Fig. 23 , page 9). Scott relates *H. mcmurtryi* to two species namely *H. asperula,* because of its retused nature, and *H. koelmaniorum*. In his original description he placed *H. mcmurtryi* within the section *Retusae,* but later in his book The Genus Haworthia he placed it within the section *Limifoliae*.

Discussion about plants from different localities

With no knowledge of how and where to look for *H. koelmaniorum*, Johan discovered a tiny *H. koelmaniorum* by midday about 10 km south of the type locality. This was the start of a very successful expedition during which another twelve localities of *H. koelmaniorum/H. mcmurtryi* were found. The very rough hills and hot sun did not contribute to making the trip an easy one. Ticks were in abundance and the author suffered from tick fever for weeks after.

In order to form a picture of the *H. koelmaniorum/H. mcmurtryi* complex, plants from a number of localities from north-east of Groblersdal to south-east of Loskopdam were compared.

Plants found at the most northerly locality, Maleoskop, have fewer and shorter leaves than plants found at the type locality (Fig. 21, page 9). Plants with single heads were found over a large area but only about 12 - 15 were observed. They grow on a westerly aspect in sandy soil and in sandstone ridges, in open sunlight.

The next locality of interest was near the type locality. Here the plants have more and longer upright leaves. This may also be the reason why Hardy wrote that, based on leaf structure, *H. koelmaniorum*'s nearest ally appears to be *H. tuberculata* from the Karoo. These plants were also growing in open sunlight, but it was noticeable that they were much darker than at Maleoskop. The plants grow mainly as single heads; only one large cluster was observed (Fig. 24 page 9).

A locality about 10 km south-west of the type locality produces plants with shorter, somewhat recurving leaves. It was however clear that it was still *H. koelmaniorum* (Fig. 22 page 9)

Southeast of Gwarrielaagte the most interesting plants were found. The plants were very large and most tended to grow in a more retused manner, but not so completely retused as *H. mcmurtryi*. Some plants had three rows of leaves consisting of seven leaves twisting anti clockwise. A very dark plant was found growing in an upright manner with a twist in its leaves, almost like *H. scabra*. The dark colour is maintained even in cultivation and the prominent ridges under the leaves make it a very interesting plant. The variation mentioned is really an exception because very little if any variation is found within localities. The vegetation at Gwarrielaagte is also grasslands, the same as for *H. mcmurtryi*, as oppose to the steeper hills with trees for *H. koelmaniorum.*

Further south, three localities of *H. mcmurtryi* were visited. Plants were growing on grass hills between rocks, were much smaller, retused and in flower. Some even had fruits at the end of August while only some plants of *H. koelmaniorum* had begun to produce

flowers at the same time. Mr John Hoffman collected small plants along the Olifantsriver south of Groblersdal. In cultivation it is very difficult to judge whether these are *H. koelmaniorum* or *H. mcmurtryi.* The locality is within the *H. koelmaniorum* distribution area but plants show a strong affinity with *H. mcmurtryi.*

Remarks

Although the relationship between *H. koelmaniorum* and *H. mcmurtryi* is now better understood, the *H. koelmaniorum/H. mcmurtryi* complex remains a "stand alone" for the time being. The localities visited did not provide any real indications as to possible relationships with other haworthias. Much fieldwork needs to be done to establish possible relationships with *H. limifolia* to the east and *H. venosa* to the west. Although *H. limifolia* is found in the mist belt, this itself should not be taken as significant. *Aloe ecklonis* and *Aloe boylei* (grassaloes) are found from the Eastern Cape through Kwazulu-Natal and then inland to even the Highveld of Mpumalanga. As is the case with the grass aloes, *H. limifolia* may break out of the mist belt to be found nearer to *H. koelmaniorum*. The area east of the known localities of both *H. koelmaniorum* and *H. mucmurtryi* has not been, or has been only very poorly explored. The same range of hills (where the two species are found), runs towards Pretoria.

Growth conditions

H. koelmaniorum/H. mcmurtryi complex is found in a succulent rich area. Numerous *Aloe* species, three *Stapelia* species, *Anacampseros, euphorbias* from the giant *Euphorbia cooperi* to the tiny *Euphorbia schinzii* were among the plants observed. The "bobbejaanstert" directly translated "tail of the baboon" or *Xerophyta* was in abundance.

During summer time (rainy season) long grass makes it extremely difficult to locate the plants. Farmers burn their fields during winter which causes plants to be exposed to open sunlight in dry soil. During this time, plants tend to withdraw into the ground, roll up their leaves (from the outside) while the ridges under the leaves gather dust which results in the plants being completely camouflaged. The author must admit that it is much easier to identify differences when judging plants from different localities in the field. In cultivation it becomes more difficult because plants lose some of their characteristics. Plants collected from the same species but from different localities in the Southern Cape generally show much more variation within localities and between localities.

Conservation status

The two species are listed as "protected" by the Department of Nature Conservation in Mpumalanga.

In a report titled "Conservation on a Landscape Scale", by E Witkowski, L Knowles and RJ Liston, the following is recorded:

"*H. koelmaniorum* is a small (10 cm in diameter rosette), cryptic succulent, restricted to seven populations totalling 1591 plants, matching the conservation authority estimate of 1800 to 2000 plants. Disturbances such as cattle grazing within this commercial life stock farming landscape, and collecting by horticulturists and for traditional "medicines" pose the biggest threats to this species; and thus it is retained in the "vulnerable" category."

The number of plants may be more because it is unlikely that populations visited during the search were exactly the same as the seven mentioned by the authors of the report.

Conclusion

As far as *H. koelmaniorum* and *H. mcmurtryi* is concerned, the author is also of the opinion that the two species should be combined, but as separate varieties as indicated in Haworthia Revisited. *H. mcmurtryi* is the smaller plant growing in grassland with a more pinkish flower. As already mentioned, *H. koelmaniorum* at its most southern locality may become retused, but the plants are still large, ± 12 cm. *H. mcmurtryi* is ± 4.5 cm in diameter, a sudden break from large *H. koelmaniorum*.

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Photographs by the author.

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