

ALSTERWORTHIA

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THE

SUCCULENT ASPHODELACEAE

JOURNAL



HA0145 *Haworthia comptoniana* - more reddish form

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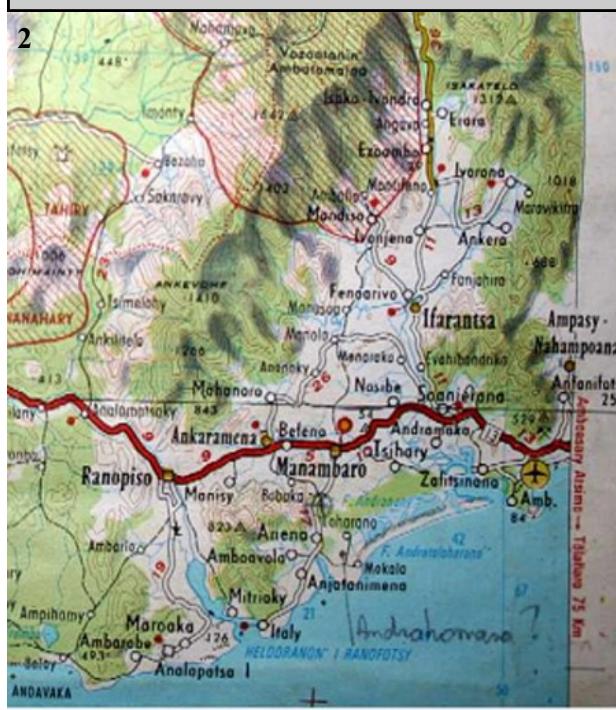
Aloe bakeri Scott-Elliott.

1



One of the four remaining
Aloe bakeri
found at the site.

2



Aloe bakeri was published by Scott-Elliott in 1891 (JLSB 29:60) when the location was recorded as sand-dunes, Fort Dauphin, Scott Eliot 2937. Later H. Perrier de la Bathie wrote: Around Fort-Dauphin, on rocks and sand. Scott-Elliott 2937 (type); Decary 9826, 9856, 10272, 10324, et 10325. Endemic. The Illustrated Handbook of Succulent Plants - Monocotyledons records the type locality as **Toliara** (Tuléar), which is on the SW side of Madagascar. However, *Aloe bakeri* is known to come from the SE - Fort Dauphin (Taolanaro), **Toliara Province**. Dr. Urs Eggli has kindly explained that "IHSP usually lists only the country and the top-order administrative unit for type localities - unfortunately, this fact was not stated in the introductory matter (*to the Illustrated Handbook of Succulent Plants - Editor*) The information under *Aloe bakeri* thus relates to Province Toliara". Thus Fort Dauphin (Tolanaano) is the only known site for *Aloe bakeri*.

Norbert Rebmann and Philippe Corman, who visited southern Madagascar last year, found that the inselberg near the airport at Fort Dauphin, where *Aloe bakeri* grew along with *Euphorbia milii* var. *imperatae*, was being destroyed, figs 3 & 4. The stone was required for the development of the port! How many *Aloe bakeri* will survive at this site (fig. 4) is not known at this stage, but it cannot be many, if any. Philippe Corman reports that they found only four plants at the site which Rauh records as rocky. They met Gerold, with whom Rauh used to work, at Fort Dauphin and were told that he did not know of any other sites for *Aloe bakeri*, so it seems highly likely that this is the only site. However, as Scott-Elliott recorded sand dunes as the site in the original descriptions, the existence of plants in sand cannot be excluded but neither Rebmann nor Corman were able to locate any plants in sand.

The ISI distributed *Aloe bakeri* in 1965 under number ISI



Map of southeast Madagascar.

447. The plants were rooted cuttings of W. Rauh 1407 collected in 1959 near Vinanibe, Dist Fort Dauphine, Madagascar. Phillippe Corman notes that here is no Vinanibe on this map. He suspect Vinanibe is the same place as Ambinanibe because ‘am’ mean ‘on’ in Malagasy, and it is sometimes omitted (for example Antananarivo became Tananarive in French); and because Vinanibe and (Am)binanibe are nearly the same pronunciation: v and b have nearly the same

pronunciation in Malagasy. But only a Malagasy could confirm this hypothesis.

Aloe bakeri is a dwarf plant which eventually forms “dense clusters of short but somewhat climbing stems with spotted leaves” and “Although delicate in appearance it is of simple culture if given shade and well drained soil” (ISI notes). This clone is still in cultivation. Fig. 4. shows a single rooted offset. Those of you who have habitat material should treasure it.

3



Rock extraction for port development at the site of *Aloe bakeri*, Fort Dauphine.

4





Aloe bakeri ISI 447

Rooted offset in 2½" square pot.

This species branches and suckers from the base. One sucker can just be seen at the rear of the photograph. Leaves are spotted white and green tinged red.
If you prefer a darkish green leaf to red provide shade.

Better still propagate it and distribute it. If you are fortunate to have different clones of the ISI distribution, the production of seed would be a constructive conservation undertaking. The documented *Aloe bakeri* in cultivation now represent almost the total stock of this species world wide. How long will it be before the few remaining plants in habitat are eradicated, leaving only plants in cultivation

As an aside, *Euphorbia milii* var. *imperatae* is recorded as an invalid name in the Illustrated Handbook of Succulent Plants - Monocotyledons because a Latin description had never been published.

References.

Illustrated Handbook of Succulent Plants - Monocotyledons.

Aloe 'Lok' D. Cumming Cultivar Nova.

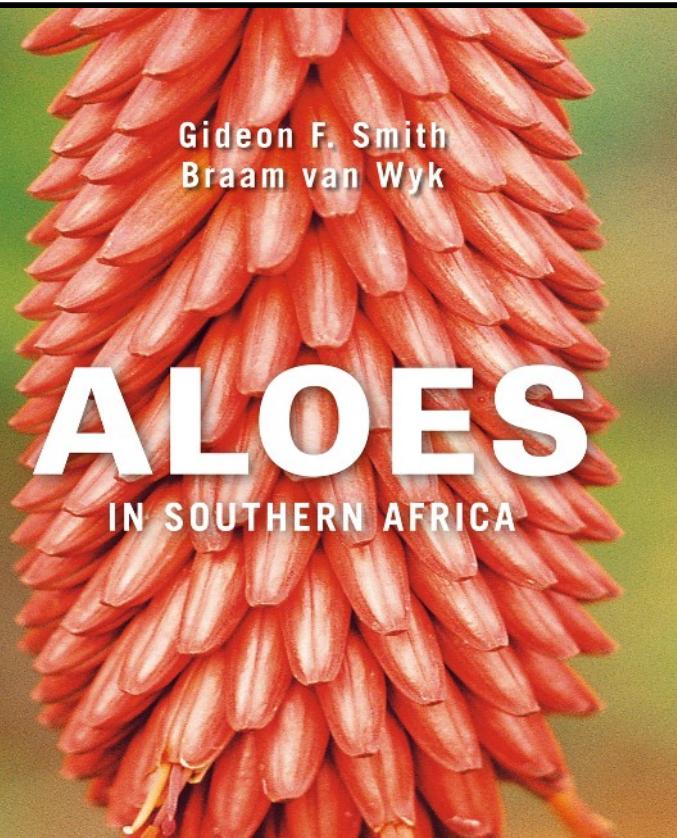


I created this cultivar some years ago but it has never been officially described - the name appeared only in my catalogue.

The total parentage is unknown but it includes *Aloe bellatula* and *Aloe descoingsii*.

The leaves are dark green with copious cream-white spots. The margins are cream with teeth to 0.7mm long. Basal suckers form dense clumps under 120mm high. The lower two-thirds of the flowers are pale pink, the upper third has cream-pink margins and pink-brown midstripes.

Propagation is by harvesting the offsets.



Gideon F. Smith
Braam van Wyk

ALOES

IN SOUTHERN AFRICA

Aloes in Southern Africa Gideon Smith & Braam van Wyk

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THE BOOK. Aloes are the flagship plants of Africa, vividly defining the landscapes in which they occur. In garden settings, these stately succulent plants capture the allure of the African savanna and serve as excellent focus plants around which other indigenous plants can be successfully grouped. *Aloes in Southern Africa* explores the character and biology of African aloes, describing their habits, characteristic features and distribution in nature. It also details

58 aloe and related species across several vegetation zones. Aloe cultivation and propagation is discussed too, providing insight into optimum growing conditions, gardening styles and plants that flourish in different regions. A feature on medicinal, cosmetic and culinary uses reveals the special properties of these intriguing plants. Whether you are starting a garden, redeveloping one or simply looking to expand your knowledge of these fascinating succulents, *Aloes in Southern Africa* will prove an invaluable guide.

THE AUTHORS:

Gideon Smith is South Africa's most prolific author on succulent plants. He has authored and co-authored numerous scientific papers, as well as popular works such as *Gardening with Succulents* (2005), *Cacti and Succulents* (2006) and *First Field Guide to Aloes* (2003). He is chief director for Biosystematics Research and Biodiversity Collections at the South African National Biodiversity Institute (SANBI).

Braam van Wyk, a graduate of the Universities of Potchefstroom and Pretoria, is a plant taxonomist by training, with a wide interest in the classification of the rich southern African flora. Among his more popular works are *Field Guide to Wild Flowers of the Highveld* (1988), *Field Guide to Trees of Southern Africa* (1997), *A Photographic Guide to Wild Flowers of South Africa* (2000) and *How to Identify Trees in Southern Africa* (2007).

PUBLISHER: Struik Publishers - www.struik.co.za

***Haworthia 'Opalina'* H.C.K. Mak**

The Repertorium Plantarum Succulentarum LIV (2003) records the name *Haworthia minima* 'Opalina', which I published in Alsterworthia International 3(1)4 based on *Haworthia opalina* M. Hayashi, as invalid (INC B Art. 43.1). I therefore correct the name to *Haworthia 'Opalina'*.

Change of e-mail address - Belgium representative.

Please note that Frank Thys' e-mail address is now <frank-diane@skynet.be>.

M.B. Bayer Personal Collection Numbers

Bruce Bayer

The following are additions to the list published in Haworthia Update 2, pages 155-162

6558 cooperi v. dielsiana	3225 DB	N Eastpoort.	6635 mirabilis v. badia	3419 BD	Napier.
6559 cooperi v. dielsiana	3225 DB	SE Eastpoort.	6636 mirabilis v. triebneriana	3419 BA	S Greyton.
6560 cooperi v. dielsiana	3225 DB	S Eastpoort.	6637 minima v. minima	3419 DB	Mierkraal.
6561 bolusii v. pringlei	3225 DB	"Baviaanskranz, Patryschoogte."	6638 maraisii v. maraisii	3420 AC	"Rooivlei, Bredasdorp."
6562 cymbiformis v. obtusa	3226 CD	Kagasmund.	6639 mirabilis v. sublineata	3420 CA	S Bredasdorp.
6563 cooperi v. cooperi	3226 CD	Koonap Bridge.	6640 maraisii v. maraisii	3420 AC	Adoonskop.
6564 cooperi v. dielsiana	3226 CB	Chancery Hall.	6641 mutica v. mutica	3420 AC	Hasiesdrift.
6565 cooperi v. dielsiana	3225 DA	W Somerset East.	6642 pumila	3419 DD	Vinkrivier.
6566 bolusii v. bolusii	3225 AC	NE Ashbourne.	6643 mirabilis v. triebneriana	3419 BD	Fairfield.
6567 cymbiformis v. reddii	3226 BB	Waterdown Dam.	6644 mirabilis v. triebneriana	3420 BD	SW Swellendam.
6568 nigra v. nigra	3225 BD	Waterdown Dam.	6645 pumila	3319 CB	Worcester airfield.
6569 bolusii v. blackbeardiana	3226 BD	Waterdown Dam.	6646 maraisii v. maraisii	3319 DD	N Macgregor.
6570 bolusii v. blackbeardiana	3226 BD	S Estrelle.	6647 maraisii v. maraisii	3319 DD	Agter Vink.
6571 bolusii v. blackbeardiana	3227 AB	Turnstream.	6648 maraisii v. maraisii	3319 DD	SW Robertson.
6572 cymbiformis v. reddii	3227 AB	Turnstream.	6649 arachnoidea v. setata	3320 CC	E Montagu.
6573 cymbiformis v. setulifera	3227 AB	Highclere.	6650 mutica v. nitida	3420 BB	SE Heidelberg.
6574 nigra v. nigra	3224 DA	5km ENE Kendrew.	6651 magnifica v. magnifica	3421 AA	S Riversdale.
6575 nigra v. nigra	3226 CB	Adelaide.	6653 emelyae v. emelyae	3321 CD	N Sandkraal.
6580 decipiens v. virella	3224 DC	Meerlust.	6654 emelyae v. emelyae	3321 CD	N Sandkraal.
6581 decipiens v. virella	3224 DC	Welgelegen.	6655 emelyae v. emelyae	3321 CD	N Sandkraal.
6582 decipiens v. virella	3324 AB	SW Mt Steward.	6658 arachnoidea v. aranea	3321 CD	E Sandkraal.
6583 decipiens v. virella	3324 AB	NW Waaipoort.	6659 emelyae v. emelyae	3321 CD	SE Vanwyksdorp.
6584 glauca v. herrei	3324 AD	Waaipoort.	6660 emelyae v. multifolia	3321 CC	W Muiskraal.
6584a glauca v. viscosa	3324 AD	Waaipoort.	6661 arachnoidea v. nigricans	3321 CC	W Muiskraal.
6585 zantneriana v. zantneriana	3324 AD	Waaipoort.	6662 magnifica v. atrofusca	3421 AA	Kweekkraal.
6586 glauca v. herrei	3324 BC	Zeekoeisnek.	6663 magnifica v. magnifica	3420 BB	SW Heidelberg.
6587 decipiens v. minor	3324 BC	NW Die Bordjie.	6666 magnifica v. magnifica	3420 BA	S Tradouw Pass.
6588 sordida v. lavranii	3324 BC	NE DieBordjie.	6667 maraisii v. maraisii	3320 DC	SW Barrydale.
6589 cooperi v. viridis	3324 BC	NE Dorschfontein.	6668 maraisii v. maraisii	3320 CC	N Ashton.
6591 cooperi v. pilifera	3226 DC	S The Tower.	6670 maraisii v. maraisii	3319 DD	W Robertson.
6592 cooperi v. dielsiana	3226 DC	W Fort Beaufort.	6672 maraisii v. maraisii	3319 DD	Koningsriver.
6593 cymbiformis v. cymbiformis	3226 DC	E The Tower.	6673 maraisii v. maraisii	3319 DD	Kranz Reserve.
6596 kingiana	3322 CC	Moeras River.	6674 pumila	3319 DD	Kranz Reserve.
6597 cooperi v. gordoniana	3424 BB	Jeffrey's Bay.	6676 maraisii v. meiringii	3320 CC	E Goudmyn.
6598 glauca v. glauca	3325 CB	Bauerskraal.	6678 maraisii v. maraisii	3319 DD	Grootrivier.
6599 cooperi v. pilifera	3325 CB	Bauerskraal.	6680 herbacea v. paynei	3319 DD	Koningsriverberg.
6600 cooperi v. viridis	3325 AC	N Perdepoort.	6681 maraisii v. maraisii	3319 DD	Koningriver Dam.
6601 arachnoidea v. aranea	3322 CC	Moeras River.	6682 maraisii v. maraisii	3319 DD	N Koningriver Dam.
6602 cooperi v. pilifera	3326 BC	Glen Craig.	6683 maraisii v. notabilis	3319 DD	N Klaasvoogds.
6603 cooperi v. gracilis	3326 BA	NE Grahamstown.	6684 reticulata v. attenuata	3320 CC	E Dankbaar.
6604 decipiens v. xiphophylla	3325 DC	Coega.	6685 mirabilis v. diversicolor	3320 BB	Olifantsdoornkloof.
6608 arachnoidea v. setata	3322 CB	N Dysseldorp.	6686 mirabilis/maraisii	3320 BB	E Olifantsdoornkloof.
6609 truncata	3322 CB	N Dysseldorp.	6687 maraisii v. maraisii	3319 DD	SE McGregor.
6610 arachnoidea v. setata	3324 AC	N Steytlerville.	6688 herbacea v. herbacea	3319 DA	Mowers.
6611 sordida v. sordida	3325 DA	Soutkloof.	6690 arachnoidea/mucronata	3320 CA	Watervalkloof.
6612 aristata	3325 DA	Soutkloof.	6691 maraisii v. maraisii	3319 DC	NW Boschfontein.
6613 sordida v. sordida	3325 BC	Bluecliff Stn.	6692 reticulata v. reticulata	3319 DC	NW Boschfontein.
6614 cooperi v. gracilis	3326 AB	Hellspoort.	6693 reticulata var. subregularis	3319 DC	Uitvlug.
6615 glauca v. glauca	3325 AC	Paardepoort.	6694 arachnoidea v. arachnoidea	3319 DA	Kanetvlei.
6616 decipiens v. xiphophylla	3325 CA	Bauerskraal.	6696 arachnoidea v. arachnoidea	3319 BD	W Osplaas.
6618 decipiens v. minor	3325 AC	Sapkamma/Perdepoort.	6697 arachnoidea v. arachnoidea	3319 BD	E Osplaas.
6619 decipiens v. minor	3325 AC	Sapkamma/Perdepoort.	6698 venosa ssp. granulata	3319 BA	Karoopoort.
6620 decipiens v. minor	3325 AC	Sapkamma.	6700 arachnoidea v. arachnoidea	3320 CA	Soutkuil.
6621 outeniquensis	3322 CC	Moerasriver.	6702 pulchella v. pulchella	3320 CA	Soutkuil.
6622 pumila	3319 DA	Mowers.	6703 arachnoidea v. arachnoidea	3320 DA	Bellair Dam.
6623 pumila	3319 DC	W Rooiberg.	6704 arachnoidea/mucronata	3320 CB	Ouberg.
6624 minima v. poellnitziana	3320 CC	W Sanddrift.			
6625 maraisii v. maraisii	3320 CC	Sanddrift.			
6626 heidelbergensis v. scabra	3320 CC	N Sanddrift.			
6627 marginata	3320 CC	N Sanddrift.			
6628 minima v. poellnitziana	3320 CC	Sanddrift.			
6629 marginata X minima	3320 CC	E Sanddrift.			
6630 minima v. minima	3419 DB	"W Moddervlei, Elim."			
6631 mirabilis v. mirabilis	3419 DB	Mierkraal.			
6632 rossouwii v. calcarea	3420 CA	Renosterfontein.			
6633 marginata	3420 AC	Adoonskop.			
6634 marginata	3420 AC	Adoonskop.			

On reflection.

M B Bayer,

The issue of Aloe 44.1, 2007 comes as a particularly welcome one because it is dominated by articles about Haworthia, which are really packed with information and interesting comment. But I have reached closure on the subject and what really occupies my mind is my own role there. I returned the Dyer medal with which the society had honored me because I came to think that my role was misunderstood. I was not a botanist in the mould of the professional, and neither was I the amateur non-botanist achiever as was W.G.Reynolds. I was a mystery to even myself, with an empathic passion for plants.

What Gerhard Marx does in his admirable article about *H. bayeri*, is to express opinion about the nature of classification and rightfully open the question for the umpteenth time, of whether it is art or science. This is necessary because the question never seems to be satisfactorily answered and Gerhard has to write that the “bold simplification” of “superspecies” will only benefit botanists who can then “hide their lack of detailed knowledge”. In his article Gerhard has rakes lightly over the hoary issue of similarities and differences that might constitute species differences and perpetuates an argument that has raged since haworthias were first written about,

This affects me profoundly as I struggle to understand why I wrote in the first place. I am neither a scientist nor an artist and I now believe that the problem is that there are botanists who practice plant classification as though as an artist would, and artist who practice it as scientists should. Classification is a language function where nouns are introduced to describe and give meaning to objects of interest. Whatever our

respective opinions are, the nomenclatural system and latin names belongs in the realm of botanical science and must be resolved there.

The initial purpose of science was surely to explore the fundamentals of creation and its purpose. It was not to provide impressive sounding and looking epithets for any group of dedicated collectors. The problem in *Haworthia* and elsewhere in the plant kingdom is that scientists have yet to properly explain those fundamental truths it seeks. My own feelings on the subject close on the note that the real nature of plant species is not understood and this is what drives the longstanding argument of “science or art”.

The detailed knowledge that Gerhard has in respect of *H. bayeri* is inarguable, and the way he has utilized the available names is excellent. The real problem is that this approach may work there in what is indeed a complex situation, but how will we ever get it to work in respect of *H. mirabilis* or *H. cooperi* that are considerably more so. Detail in one area cannot determine how detail in all areas can be classified logically and consistently. I did in all my years of writing, try to achieve this balance which Gerhard writes about. My dismay is that this is not perceived to be the case.

What you get is what you see.

Buying plants from a catalogue or web site is not always a simple matter. Plants do have names but some may differ from authority to authority (or nursery to nursery). Even when they agree purchasers' perceptions of a species may not be uniform because of the variability of the species. It is certainly the case that the purchase of a correctly named plant may satisfy one purchaser, but not another because of their different perceptions of a variable species. Nurseries try to get round these problem in a number of ways including quoting location date or appending a brief description. However, such helpful data cannot ever hope to cater for each plant. Whilst nurseries strive, and often do, to supply plants the customer wants they can never be consistently 100% successful.

In addition to wanting attractive plants for a collection some purchasers go a step further and want plants that have potential for breeding purposes. A number of forms of certain species are known to have breeding potential. What every keen breeder wants is something unique. The genes required may produce some visual signs in few plants which might be available for a lucky chance purchase, but tracking down the genes is far from easy as some such genes may be latent, to be released only by selected crossing of the species or by hybridisation. A lucky purchaser may collect one of these in a chance purchase by post, but they tend to be few

and

far apart.

One nursery, Gariep Plants of South Africa, which trades internationally, has taken to offering especially attractive plants and/or plants with breeding potential on an individual bases. A numbered photograph of each plant is posted on their web site, each with a price. You order from the photographs. What you get is what you see. There is a good demand for such plants. There are no prizes for guessing from which Far East country such plants are eagerly sought!

A number of *Haworthia comptoniana* have been featured. The difference between HAO145 and HAO144 is obvious but from a breeding point of view the whiter, broad leaves of HAO144 have breeding potential. HA0145, front cover, is a more reddish form of *Haworthia comptoniana* with breeding potential. HA0054 is one of a number of variations of *Haworthia pumila*. HA0092, back cover is a hybrid, *Haworthia fasciata* x *Haworthia marginata*, magnificent in its own right but replete with breeding potential. None of these plants are now available but others will be in due course when they will be listed on Gariep's website <www.kambaroo.com>.



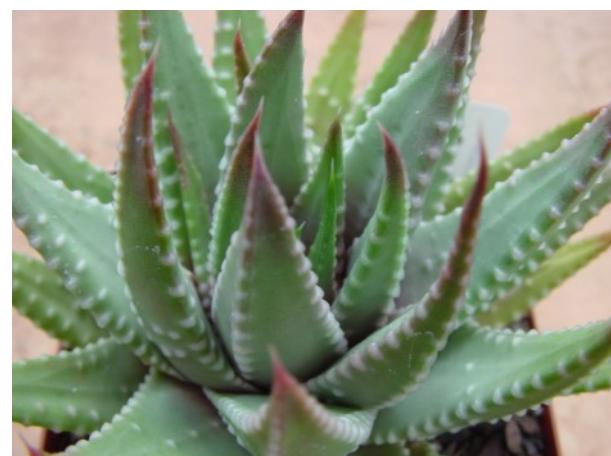
HA0145 *H. comptoniana*



HA0144 *H. comptoniana* more whitish.



HA0142 *H. atrofusca* x *emelyae* hybrid.

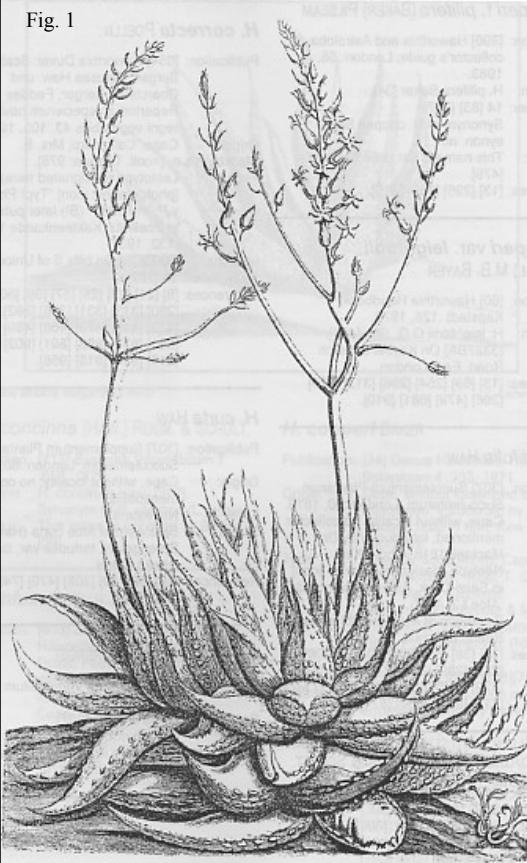


HA0054 *Haworthia pumila*

Application of correct names to some old Haworthias

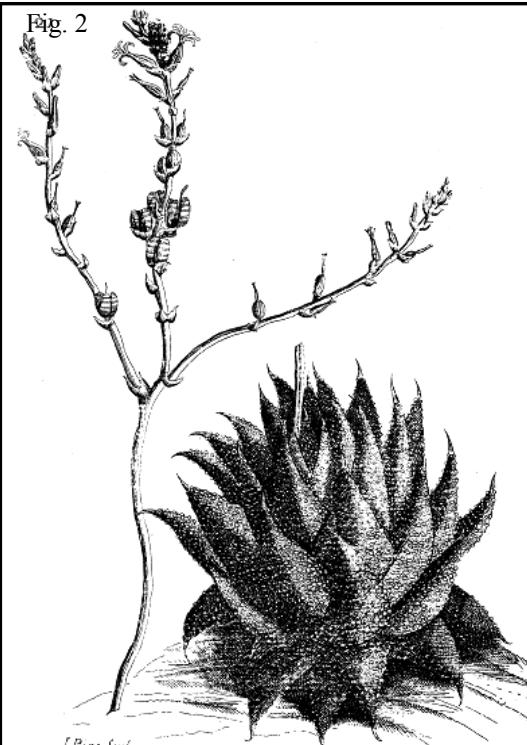
Dr. Hayashi

Fig. 1



Aloe Africana folio in summitate triangulari
margaritifera, flore subviridi. C. Commelin

Fig. 2



Aloe margaritifera v. major Bradley 1725
History Succ. Pl. 121 No data Lectotype

There is much confusion or misapplication of some important old names such as *H. pumila* (*H. margaritifera*, *H. maxima*), *H. arachnoidea*, *H. herbacea* or *H. obtusa*. About half can be attributed to the 1800's, the others were mostly the result of Bayer's strange name choices. Scott seems to have had a better understanding of correct names, though he did not present clear (detailed) evidence. Table 1, page 8 compares the application of names to some species by Scott (1985), Bayer (1999), Breuer (2002) and Hayashi (2006, present paper). Most old figures used in this paper are copied from Ingo Breuer's "The World of Haworthias Vol. 1 & 2". The author wishes to express his sincere thanks to Ingo for supplying helpful information and figure data.

***H. maxima* (L.) Haworth (Fig. 1).**

There is much confusion over the application of names for the varieties of *Aloe pumila* Linneus (Table 2). *Aloe pumila* a. v. *margaritifera* L. is a well known case of such confusion. The lectotype of this plant is Commelin 1701, t. 10 (Fig. 1). It has large leaves with many, large tubercles. Identical plants are widely known in the Worcester- Robertson area.

The correct name for *Aloe pumila* a. v. *margaritifera* L. was well discussed by R. Mottram (2000a). The following discussion basically agrees with him except for the name *H. herbacea*, though he corrected it later (Mottram 2000b).

International Code of Botanical Nomenclature (ICBN, Vienna, 2006) stipulates in Art. 11-4; "For any taxon below the rank of genus, the correct name is the combination of the final epithet of the earliest legitimate name of the taxon in the same rank, with the correct name of the genus or species to which it is assigned, except, (b) if the resulting combination could not be validly published under Art. 32.1(c) or would be illegitimate under Art. 53" (later homonym).

Table 2 compares the history of old names for "H. pumila". As shown in this table, the name "Haworthia pumila" ought to be the correct name for *Aloe pumila* a. v. *margaritifera* L. (Art. 11-4). But when Duval created the genus *Haworthia*, he made the name "Haworthia pumila" based on *Aloe arachnoidea* v. *pumila* Aiton, not on *Aloe pumila* a. v. *margaritifera* L. And *Aloe arachnoidea* v. *pumila* Aiton is based on Boerhave 1720, t. 131 (Fig. 4), which is Linneus' *Aloe pumila* var. ε (presumably the same as Bayer's "H. heidelbergensis v. minor").

The name "Haworthia pumila", therefore, became unusable for Linneus' var α, as it is a later homonym (Art. 53-1). In this point, *H. pumila* (L.) Duval sensu Scott and *H. pumila* (L.) Bayer are obvious errors.

The second earliest specific epithet for Commelin 1701, t. 10 next to "pumila" is *Aloe "margaritifera"* (L.) Burman (1768). But this name is superfluous for *A. pumila* L. and illegitimate (Art 52. 1). *H. margaritifera* (L.) Haw. (1819) is a valid name, but it has no priority over *H. maxima* (Haw.) Duval (1809), as *Aloe margaritifera* is illegitimate. Furthermore, Haworth published this name for Bradley (1725) t. 21 (= *H. major*, Fig. 2), not for Commelin 1701, t. 10 (= *H. maxima*, Fig. 1). *H. margaritifera* (L.) Haw. is a synonym of *H. major* (Aiton) Duval. Bradley t. 21 is a small plant and rather close to *H. minima*. It is never same as *H. maxima*.

The third specific epithet for Commelin t. 10 is *H. "maxima"* (Haw.) Duval (1809). As the 2 prior epithets could not be used for Commelin t. 10, *H. maxima* (Haw.) Duval became the correct name (substitute name) for Linneus' *Aloe pumila* a. v. *margaritifera*.

***H. major* (Aiton) Duval (Fig. 2).**

The type figure of this plant is Bradley 1725, t. 21 (Fig. 2, page xx). In this figure, the plant has broad, flattish leaves with small tubercles. The size of this plant seems rather small based on the comparison with its peduncle, and the leaf color seems dark. Broad and flattish leaves are the characteristics of *H. marginata* or *H. kingiana*. It is bar-like in *H. maxima* or "*H. minima*".

Table 3 compares plants concerning "*H. major*". As shown in bold red in this table, the Bredasdorp (Mierkraal) deme of "*H. minima*" has broad, flattish and concave leaves (Front cover). These are very unique

Fig. 3

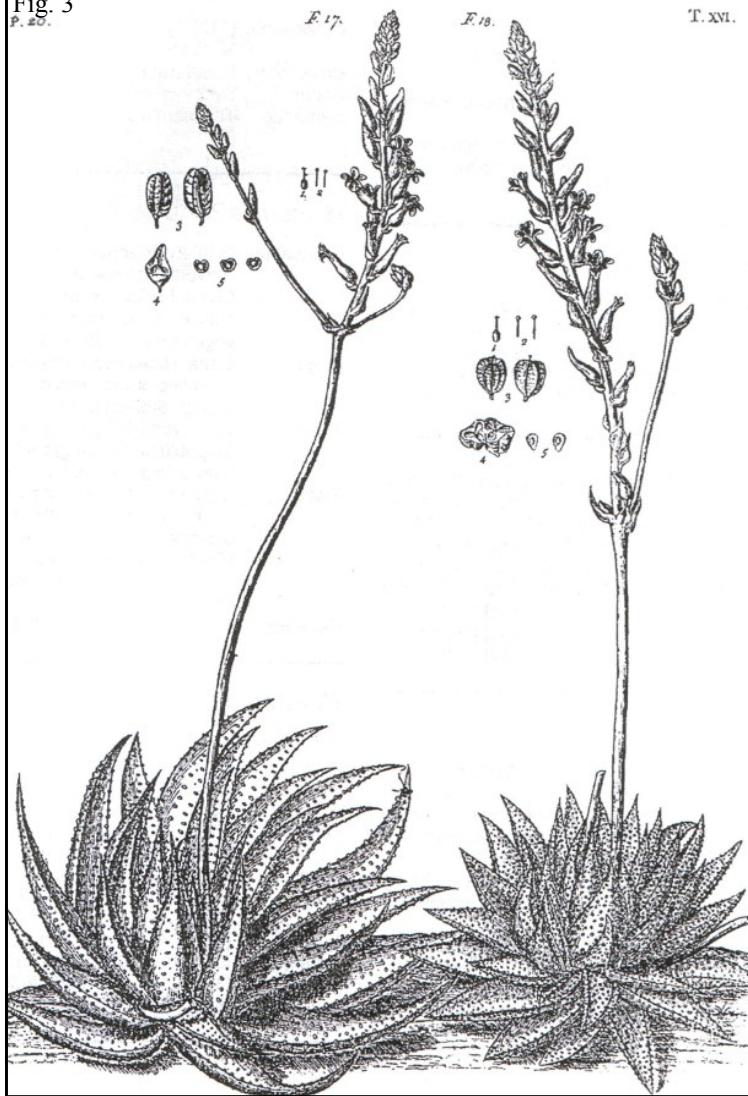
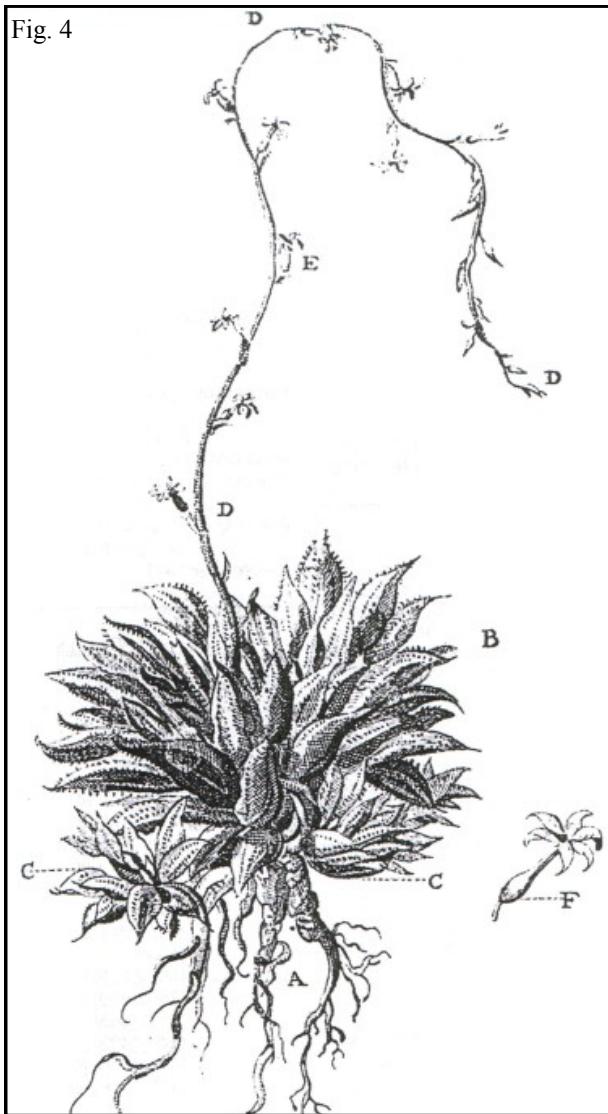
Aloe africana margaritifera minor f. 17
Aloe africana margaritifera minor f. 18J.J. Dillenius
(1732)

Fig. 4



Aloe africana minima atroviridis

H. Boerhave 1720

distinctions and hardly found in other "*H. minima*". It compares well with Bradley 1725, t. 21. This deme is well separated from other demes of "*H. minima*" in Heidelberg-Mossel Bay area. It is concluded, therefore, that the name "*H. major*" should be applied to the Bredasdorp deme and that it is a different species from *H. maxima* or "*H. minima*". A sparse tuberculated mutant of this deme was described later as *H. mutabilis* Poellnitz (Fig. 6). This plant also has broad, flattish leaves with concave upper surface.

H. minor Duval (Fig. 3).

This is Linneus' *Aloe pumila* v. β . The type figure is Dillenius 1732 t.16, fig. 17 (Fig. 3 left). The type of *Aloe pumila* v. γ L. was also drawn in the same plate as fig. 18 (Fig. 3, right). Both figures in this plate look very similar despite the minor difference of the plant size. As shown in Table 2, both plants have small tubercles, few peduncle branches and a small seed rim. These characteristics clearly indicate that they are not *H. maxima*.

Bayer (1976, 1982, 1999) interpreted *Aloe pumila* v. β as *H. maxima* (*H. pumila* sensu Bayer) and v. γ as *H. minima*. It is very difficult to consider, however, that Dillenius' fig. 17 and 18 are different species and fig. 17 is same to *H. maxima* (Commelin 1701 t. 10). Compare Fig. 3 with Fig. 1.

Dillenius 1732 is an illustrated catalogue of rare plants in the botanical garden 'Hortus Elthamensis'. Only 4 haworthioid plants are figured in this book, namely *H. viscosa*, *Astroloba spiralis*, *H. minor* and *H. minima*

(Breuer, private communication). Other well-known haworthias in the European world by that time were not figured in this book such as *H. retusa* or *H. arachnoidea*. It is not unnatural, therefore, that *H. maxima* was not figured in Dillenius 1732.

H. minor is considered a small plant in comparison with its peduncle size. There are some dwarf forms in the *H. maxima* group such as *H. akaonii* or *H. ao-onii*, but they are very rare and only grow in restricted small areas. It is difficult to presume that they were collected in the early 1700's.

"*H. minima*" is a widely distributed, very variable plant, especially in size. It is rather natural that both figs. 17 and 18 in Dillenius 1732 t.16, are "*H. minima*". Bayer himself (2001 p. 213, with van Jaarsveld) arranged both figures into *H. minima*. If so, however, the name *H. minor* Duval (1809) has priority over *H. minima* Haw. (1812). Duval may also have considered that Dillenius 1732 t.16, fig. 17 and fig. 18, page xx are the same species. This may be the reason why Duval upheld only Dillenius 1732, fig. 17 as *H. minor* and completely ignored fig. 18. The correct name, therefore, for Dillenius 1732 t.16, fig. 17 and fig. 18 is *H. minor* (Aiton) Duval. *H. minima* (Aiton) Haw. (1812) is a later synonym of *H. minor* (Aiton) Duval (1809).

H. arachnoidea (L.) Duval (Fig. 7).

This is *Aloe pumila* v. δ *arachnoidea* L. and the type figure is Commelin 1703, t. 27 (Fig. 7). Scott (1977, 1985)

Table 1. Comparison of some name applications in <i>Haworthia</i>							
Original name	Type figure	Present Fig. No.	(Presumed) locality	Scott (1985)	Bayer (1999)	Breuer (2002)	Hayashi (2007)
<i>A. pumila</i> v. <i>margaritifera</i> L.	Commelin 1701 t. 10	Fig. 1.	Worcester	<i>H. pumila</i> (L.) Duval	<i>H. pumila</i> (L.) Bayer	<i>H. maxima</i> (Haw.) Duval	<i>H. maxima</i> (Haw.) Duval
<i>A. margaritifera</i> v. <i>major</i> Aiton	Bradley 1725 t. 21	Fig. 2.	Mierkraal, Bredasdorp	<i>H. pumila</i> (L.) Duval	<i>H. pumila</i> (L.) Bayer	?	<i>H. major</i> (Ait.) Duval
<i>H. minor</i> (Aiton) Duval (<i>A. pumila</i> β L.)	Dillenius 1732 t.16, fig. 17	Fig. 3. left	Heidelberg	<i>H. pumila</i> (L.) Duval	<i>H. pumila</i> (L.) Bayer	<i>H. maxima</i> (Haw.) Duval	<i>H. minor</i> (Ait.) Duval
<i>H. minima</i> (Aiton) Haw. (<i>A. pumila</i> γ L.)	Dillenius 1732 t.16, fig. 18	Fig. 3. right	Heidelberg	<i>H. minima</i> (Aiton) Haw.	<i>H. minima</i> (Aiton) Haw.	<i>H. minima</i> (Aiton) Haw.	<i>H. minor</i> (Ait.) Duval
<i>A. pumila</i> v. <i>arachnoidea</i> L.	Commelin 1703 t. 27	Fig. 7.	Worcester	<i>H. arachnoidea</i> (=H. <i>pallida</i>)	<i>H. arachnoidea</i> (=H. <i>setata</i>)	<i>H. arachnoidea</i> (=H. <i>setata</i>)	<i>H. pallida</i> Haw.
<i>H. setata</i> Haw.	Kew 1818	Fig. 11.	Worcester	<i>H. setata</i>	<i>H. arachnoidea</i> (=H. <i>setata</i>)	<i>H. arachnoidea</i> (=H. <i>setata</i>)	<i>H. setata</i>
<i>A. herbacea</i> Miller (<i>A. pumila</i> ε L.)	Boerhave 1720 t. 131	Fig. 12. (=Fig. 4.)	Bredasdorp	?	<i>H. herbacea</i> (=H. <i>pallida</i>)	<i>H. herbacea</i> (=H. <i>pallida</i>)	<i>H. atroviridis</i> (Medik.) Hayashi
<i>H. obtusa</i> Haw.	Kew 1824	Fig. 16.	Somerset East	<i>H. cymbiformis</i> v. <i>obtusa</i> (=H. <i>blinkia</i> n.n. Katrivier)	<i>H. cymbiformis</i> v. <i>obtusa</i> (=H. <i>umbraticola</i>)	<i>H. cymbiformis</i> v. <i>obtusa</i> (=H. <i>cymbiformis</i> v. <i>obesa</i>)	<i>H. obtusa</i> (=H. <i>dielsiana</i> ?)
<i>H. aristata</i> Haw.	Kew 1818	Fig. 22.	Little Karoo	<i>H. aristata</i> (=H. <i>unicolor</i>)	<i>H. aristata</i> (=H. <i>lapis</i>)	<i>H. aristata</i> (W. Ladismith)	<i>H. aristata</i> (=H. <i>scottii</i> ?)
<i>H. scabra</i> Haw.	Kew 1818	Fig. 26.	Schoemanspoort	<i>H. scabra</i> (=H. <i>morrisiae</i>)	<i>H. scabra</i> (=H. <i>tuberculata</i>)	<i>H. scabra</i>	<i>H. scabra</i> (=H. <i>morrisiae</i>)
<i>H. morrisiae</i> Poelln.	Kakteenkunde 1937: 132	Fig. 28.	Schoemanspoort (Cango)	<i>H. scabra</i>	<i>H. scabra</i> v. <i>morrisiae</i>	<i>H. scabra</i>	<i>H. scabra</i>
<i>H. tuberculata</i> Poelln.	Feddes Repert. 29: 219	Fig. 29.	Oudtshoorn	<i>H. tuberculata</i>	<i>H. scabra</i>	<i>H. tuberculata</i>	<i>H. tuberculata</i>

allied this plant to “*H. herbacea*” sensu Bayer (= *H. pallida*, Fig. 10) but Bayer (1976, 1982, 1999) compared it to a setate plant (= *H. setata* Haw., Fig. 11). Both plants grow in the Worcester-Robertson area.

There are 5 plants in the *Haworthia* group in Commelin 1703, as arranged in Table 4, that are, according to Bayer, *H. arachnoidea* (Fig. 7), *H. venosa* (Fig. 8), *H. marginata*, *H. viscosa* (Fig. 9) and *Astroloba spiralis*. These figures are presumed to be drawn by the same painter (see very similar touch of ground of figures). Three *Haworthia* plants in Commelin 1703 were drawn with flowers. It should be noted in Commelin 1703, the flower of *H. venosa* (Fig. 8) and *H. viscosa* (Fig. 9) were drawn very correctly with bilabial lobes, while in Commelin 1701 *Haworthia* flowers were drawn only symbolically. The flowers of *H. arachnoidea* (Fig. 7), therefore, should have been drawn correctly in their lobe form. They are not bilabial but open lobed like those of *H. pallida* or *H. reticulata*.

Table 5. compares the lectotypes of *H. arachnoidea* (Fig. 7), *H. pallida* (Fig. 10) and *H. setata* (fig. 11). As clearly shown in bold red, *H. arachnoidea* (Commelin 1703, t. 27) has robust peduncle, large flowers and open lobes (not bilabial). These are very unique distinctions for *H. pallida* (= “*H. herbacea*” sensu Bayer), but never found in *H. setata* or any other *Haworthia* species except *H. reticulata*. These floral distinctions, especially open lobes, are very clear evidences for the identification of this plant. The name *H. arachnoidea* should be applied to “*H. herbacea*” sensu Bayer (= *H. pallida*), as Scott indicated. Many other vegetative distinctions in this figure (see Table 5) also support this identification.

Table 6 compares the history of names associated with “*H. arachnoidea*”. Correct names for each type are shown in grey. *H.*

arachnoidea is the correct name for Bayer’s “*H. herbacea*”, but I offer to use the name *H. pallida* for this plant as the substitute name to avoid confusion. The correct name for Bayer’s “*H. arachnoidea*” is *H. setata*. As for the name *H. herbacea*, see the next discussion.

***H. herbacea* (Miller) Stearn (Fig. 12 = Fig. 4).**

The type figure of *Aloe pumila* v. ε L. is Boerhave 1720 t. 131 (Fig. 12). It was named *Aloe herbacea* by Miller (1768), and then *Haworthia herbacea* (Miller) Stearn (1938). The latter is the correct name for this plant.



Fig. 5. *Haworthia major* Mierkraal.

Table 2. Comparison of names concerning "*H. pumila*"

type	Commelin 1701	Bradley 1725	Dillenius 1732, t. 16		Boerhave 1720
	t. 10	t. 21	fig. 17	fig. 18	t. 131
Present Fig. No.	Fig. 1	Fig. 2	Fig. 3 left	Fig. 3 right	Fig. 4
characters in figure					
plant size	large	semi-small	small	small	small
leaf	narrow	broad	narrow	narrow	thin
tuberclle	bar-like	flattish	bar-like	bar-like	retused
peduncle	large	small	small	small	absent
ped. branch	thick	thick	thick	thick	thin
seed rim	many (5)	a few (2)	a few (2)	a few (1)	non (0)
presumed locality	Worcester	Bredasdorp	Ashton?	Heidelberg?	Bredasdorp
1753 Linneus	<i>Aloe pumila</i> α v. <i>margaritifera</i>		<i>Aloe pumila</i> β	<i>Aloe pumila</i> γ	<i>Aloe pumila</i> ε
1768 Burman	<i>A. margaritifera</i>				
1768 Miller					<i>Aloe herbacea</i>
1786 Medikus					<i>Catevala atroviridis</i>
1789 Aiton	(<i>A. margaritifera</i> v. <i>margaritifera</i>)	<i>A. margaritifera</i> v. major	<i>A. margaritifera</i> v. minor	<i>A. margaritifera</i> v. minima	<i>A. arachnoidea</i> v. <i>pumila</i>
1800 De Candolle					<i>A. atrovirens</i>
1804 Haworth	<i>A. maragaritifera</i> v. maxima	<i>A. margaritifera</i> v. major	<i>A. margaritifera</i> v. minor	<i>A. margaritifera</i> v. minima	<i>A. pumila</i> (Aiton)
1809 Duval	Haworthia maxima (Haw.)	H. major (Aiton)	H. minor (Aiton)		H. pumila (Aiton)
1812 Haworth				H. minima (Aiton)	
1819 Haworth		<i>H. margaritifera</i> (L.)			
1938 Stearn					H. herbacea (Miller)
1938 Poellnitz		<i>H. mutabilis</i>			
1978 Scott	<i>H. pumila</i> (L) Duval				
1999 Bayer	<i>H. pumila</i> (L) Bayer	<i>H. minima</i>	<i>H. minima</i>	<i>H. minima</i>	(<i>H. heidelbergensis</i> v. <i>minor</i>)
2007 Hayashi	<i>H. maxima</i>	<i>H. major</i>	<i>H. minor</i>	H. minor	H. atroviridis
		: correct name			: substitute name

Aloe pumila v. ε L., however, is not Bayer's "*H. herbacea*". Table 7 compares distinctions of Boerhave 1720, t. 131 and 3 applicants for it, namely Bayer's "*H. herbacea*" (= *H. pallida*, Fig. 13), *H. heidelbergensis* v. *minor* (MBB 6531 Bredasdorp, Fig. 14) and *H. maraisii* (MBB 6956 Robertson, Fig. 15). This locality is one of the oldest of *H. maraisii*.

As clearly shown in Table 7, the plant of Boerhave 1720 t. 131 has recurved, retuse leaves, but Bayer's "*H. herbacea*" has incurved, non-retuse leaves. The former was named "*Aloe africana minima atroviridis*,..." by Boerhave himself and later named *Catevala atroviridis* Medikus (1786) or *Aloe atrovirens* De Candolle (1800). These names indicate it is a dark plant, but "*H. herbacea*" sensu Bayer is a light green, pallid plant. Boerhave 1720, t. 131 also indicates that it is a very proliferous plant.

The floral distinctions are

Table 3. Comparison of plants concerned with "*H. major*"

Name	H. major	"H. minima"	"H. minima"	H. maxima
type/locality	Bradley 1725 t. 21	Bredasdorp	Heidelberg	Worcester
plant size	semi-small	small	small	large
tubercles	small, dense	small, dense	small, dense	large, sparse
leaf color	dark green ?	dark green	bluish	deep green
leaf width	wide	wide	narrow	narrow
leaf upper	concave	concave	convex	convex
leaf section	flattish	flattish	bar-like	bar-like
peduncle	a few	a few	a few	many
branch	(2)	(1~2)	(1~2)	(ca. 5)

Table 4. Haworthia drawings in Commelin 1703

Plate	Present Fig. No.	Names in the late 1700'	Bayer's name	lobe form
t. 27	Fig. 7.	<i>Aloe pumila</i> v. <i>arachnoidea</i> L.	<i>H. arachnoidea</i>	widely open
t. 28	-	(<i>Aloe variegata</i>)	-	-
t. 29	Fig. 8.	<i>Aloe venosa</i> Lamarck	<i>H. venosa</i>	bilabial
t. 30	-	<i>Aloe marginata</i> Lamarck	<i>H. marginata</i>	-
t. 31	Fig. 9.	<i>Aloe viscosa</i> L.	<i>H. viscosa</i>	bilabial
t. 32	-	<i>Aloe spiralis</i> L.	<i>Astroloba spiralis</i>	-

conclusive evidence that Boerhave 1720, t. 131 is completely different from "*H. herbacea*" sensu Bayer. As indicated in bold red in Table 7, the plant in Boerhave 1720, t. 131 has thin peduncles and small flowers, while "*H. herbacea*" sensu Bayer has robust peduncles and very large flowers with open lobes. Boerhave 1720, t. 131 (= *H. herbacea* Stearn) should never be equated with Bayer's "*H. herbacea*". Bayer's misapplication of the name *H. herbacea* to his "*H. herbacea*" is the most difficult-to-understand error.

It is clearly shown in Table 7 that the name *H. herbacea* (Miller) Stearn (= Boerhave 1720, t. 131) should be applied to Bayer's *H. heidelbergensis* v. *minor*. *H. maraisii* is another possible applicant, but it is never a proliferous plant. Lectotype of *H. pallida* (Fig. 10) well agrees to Bayer's "*H. herbacea*" (note peduncle thickness, flower size and lobe shape).

But the name "*H. herbacea*" is erroneously used widely for *H. pallida* (in Bayer's sense). To use the name *H. herbacea* for Bayer's *H. heidelbergensis* v. *minor* may result in severe confusion. The application of the names *H. arachnoidea* and *H. herbacea* is particularly complicated and confused. It may be better, therefore, not to use both names to avoid confusion. I offer to use the name *H. pallida* for "*H. herbacea*" sensu Bayer and *Haworthia atroviridis* (Medikus) Hayashi comb. nov. (basionym *Catevala atroviridis* Medikus 1786, epitype MBB 6531 Bredasdorp) for *H. heidelbergensis* v. *minor* instead of *H. herbacea* (Miller) Stearn.

H. obtusa Haw. (Fig. 16).

This is another big problem with this old *Haworthia* name. Uitewaal considered it as an earlier name of *H. cooperi* (*H. pilifera*), while Scott (1976, 1985), Bayer (1999) and Breuer (2000) applied this name to several "forms" of *H. cymbiformis* (Kat River plant, *H. umbraticola* or *H. cymbiformis* v. *obesa*).

Table 8 compares type figures of *H. obtusa* (Fig. 16, Kew Herbarium, lectotype), Cooperi group (Fig. 17 *H. cooperi*, Fig. 18 *H. dielsiana*) and three plants of Cymbiformis group cited as *H. cymbiformis* v. *obtusa* by Scott (Fig. 19. *H. blinkia* n.n.), Bayer (Fig. 20. *H. umbraticola*) and Breuer (Fig. 21. *H. cymbiformis* v. *obesa*).

As shown in bold red in Table 8, the Cooperi group has unique distinctions in its window and vein characters. The window area of Cooperi group has clear demarcation from other

Table 5. Comparison of characters associated with " <i>H. arachnoidea</i> ".			
Present Fig. No.		Fig. 7.	Fig. 10.
Character		Aloe pumila v. arachnoidea L. Commelin 1703, t. 27	H. pallida Worcester
F l o w e r	peduncle	thick	thick
	flower size	large	large
	lobe form	widely open	widely open
	open flower	numerous (13)	many (5~7)
L e a f	leaf upper	convex	convex
	spines-1	thick	thick
	spines-2	sparse	sparse
	maculae	absent	present
			absent

leaf surface, while it is involved (not clearly separated) in the Cymbiformis group. Also the veins in the window of Cooperi group are parallel and do not reach to the apex. Though some forms (or clones) of Cooperi group (i.e. *H. luri*) have irregularly connected veins which often reach to the apex, parallel and interrupt veins can be seen only in the Cooperi group, but are never seen in the Cymbiformis group. It is clear, therefore, that if a plant has parallel and interrupt veins, it is never a form of *H. cymbiformis* but a member of the Cooperi group.

H. obtusa in Kew Herbarium (lectotype, Fig. 16) has clear demarcation of window area and the veins in the window area are all parallel (not confluent) and interrupt (never reach to the apex). These distinctions agree well with those of the Cooperi group, but are never found in the Cymbiformis group. It is concluded, therefore, that *H. obtusa* is the earlier name for the Cooperi group (perhaps *H. dielsiana*).

Scott (1976, 1985) also indicated the difference of window demarcation and vein character between Cooperi group (*H. pilifera*) and Cymbiformis group (*H. cymbiformis* v. *obtusa*).

Table 6. History of names associated with "*H. arachnoidea*".

Type	Commelin 1703 t. 27		Kew 1818	Boerhave 1720 t. 131	Kew 1820
Year	Author	Fig. 7	Fig. 11	Fig. 2	Fig. 10
1753	Linneus	Aloe pumila δ v. arachnoidea		Aloe pumila ε	
1768	Burman	A. arachnoidea			
1768	Miller			A. herbacea	
1786	Medikus	Catevala arachnoidea		Catevala atroviridis	
1789	Aiton			A. arachnoidea v. pumila	
1804	Haworth			A. pumila (Aiton)	
1809	Duval	Haworthia arachnoidea		H. pumila (Aiton)	
1819	Haworth		H. setata		
1821	Haworth				H. pallida
1938	Stearn			H. herbacea	
1985	Scott	H. arachnoidea (= <i>H. palida</i>)	H. setata	?	H. arachnoidea
1999	Bayer	H. arachnoidea (= <i>H. setata</i>)	H. arachnoidea v. <i>setata</i>	(<i>H. heidelbergensis</i> v. <i>minor</i>)	<i>H. herbacea</i>
2002	Breuer	H. arachnoidea (= <i>H. setata</i>)	H. arachnoidea v. <i>setata</i>	(<i>H. heidelbergensis</i> v. <i>minor</i>)	<i>H. herbacea</i>
2007	Hayashi	H. pallida	H. setata	H. atroviridis	<i>H. pallida</i>

correct name

substitute name

But he mostly compared *H. pilifera* with his “*H. cymbiformis* v. *obtusa*” (Fig. 19). He missed that the type figure of *H. obtusa* (Fig. 16) has clear demarcation of windows and parallel, interrupt veins.

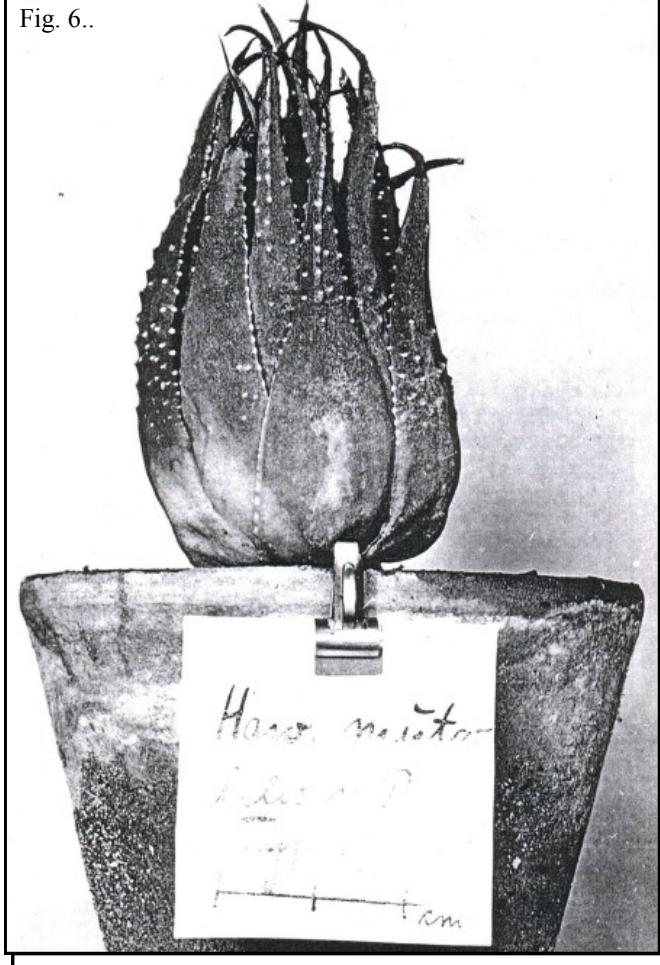
Scott (1985 p. 93) did not give the locality for his figure of *H. cymbiformis* v. *obtusa* (Fig. 19), but it is easily presumed from the text that it may be a Kat River plant (Scott 600). Kat River plant (Lower Blinkwater, *H. blinkia* n.n. Hayashi) is very variable but it usually has a more opaque, dull window and pointed leaves. It should be noticed that *H. cymbiformis* v. *obtusa* in Scott 1985 (Fig. 19) has involved demarcation of windows and irregularly connected veins which mostly reach to the apex. These characters are very different from those of *H. obtusa* in the Kew drawing (Fig. 16).

The main claim of Scott is that the type figure of *H. obtusa* (Fig. 16) has no marginal teeth, while *H. pilifera* (*H. cooperi*) has prominent teeth. He concluded, therefore, *H. obtusa* is a form of *H. cymbiformis*, as it is a completely glabrous species. But there are many demes of *H. cooperi* (*H. pilifera*) with completely glabrous margin. And there are some forms of *H. cymbiformis* with prominent marginal teeth (i.e. *H. cymbiformis* v. *setulifera*). Presence or absence of marginal teeth is not a stable character to identify these 2 groups.

Also the color of leaves is not a stable character, as it easily changes with cultivation condition. Window or vein characters are far more stable and discussion based on such characters is more reliable than those based on leaf color such as by Bayer & Pilbeam (1974). Habitat nature is clearly different between Cooperi and Cymbiformis groups, but it does not help to identify the correct name application.

Finally, the localities of “*H. cymbiformis* v. *obtusa*” cited by Scott, Bayer and Breuer are all very mountainous areas (Lower Blinkwater, Swartwater Poort, Idutywa). It may be

Fig. 6..



Haworthia mutabilis

improbable that the type plant of *H. obtusa* was collected from such an area in the early 1800's.

H. aristata Haworth (Fig. 22).

Bayer applied this name to Zuurberg plants (=*H. lapis* or its allies, Fig. 23). But the lectotype of *H. aristata* in Kew (1818, Fig. 22) clearly indicates that this plant has no window at all near the leaf tip. Bayer's “*H. aristata*” in the Zuurberg area (Fig. 23) has large, clear window. The name application of *H. aristata* to the plant of Zuurberg area is an obvious error. Furthermore, Lapis group is considerably limited around Zuurberg area, particularly in the mountainous area. It may be improbable that they were collected and sent to Kew in the early 1800's.

There are several demes around Barrydale-Calitzdorp-Oudtshoorn area which have windowless (opaque) leaves with simple, incurved arista on the leaf tip. They are named *H. integra*, *H. venteri*, *H. mclareni*, *H. unicolor*, *H. rycroftiana* (Fig. 24), *H. setata* v. *subinermis* and *H. scottii* (Fig. 25). The name *H. aristata*, therefore, should be applied to some of them. *H. scottii* may be one of the most probable applicants.

H. scabra Haworth (Fig. 26).

The illustration of *H. scabra* by Salm-Dyck (1836, Fig. 27)

Fig. 7



Aloe humilis africana arachnoidea

C. Commelin 1703

agrees well with the lectotype of *H. scabra* (Fig. 26, Kew 1818). These figures clearly indicate that the name *H. scabra* is better applied to the plant described as *H. morrisiae* Poellnitz (Fig. 28), but not to *H. tuberculata* (Fig. 29). As indicated by Scott (1980), *H. morrisiae* is a synonym of *H. scabra* and Bayer's "H. scabra" should be called *H. tuberculata*. Compare Bayer's "H. scabra v. scabra" (Fig. 30) and "H. scabra v. morrisiae" (Fig. 31) with Figs. 26~29.

Supplement

There are some illegitimate names published by Bayer recently. They are arranged in Table 9.

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(Continued on page 18)

Fig. 10

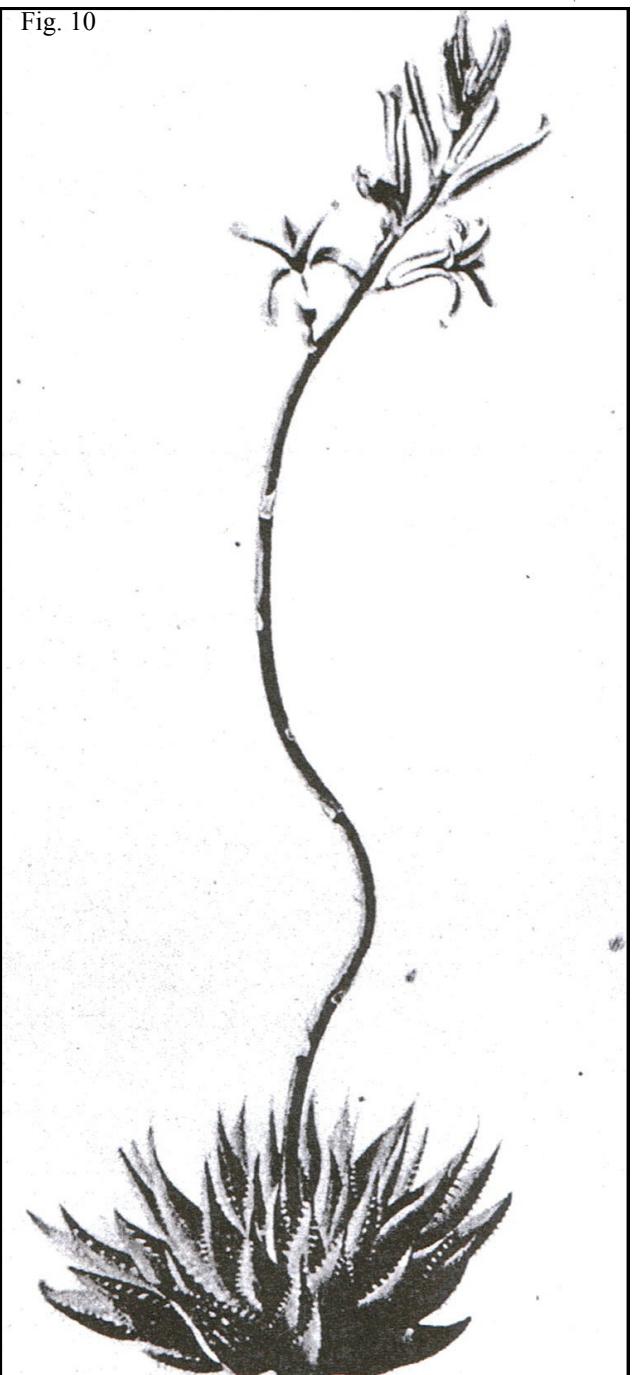


Fig. 9



Fig. 11



Fig. 8 <i>Aloe africana humilis folio non nihil reflexo</i> C. Commelijn 1703	Lectotype

Fig. 9 <i>H. pallida</i> Kew Herbarium 1820	Lectotype

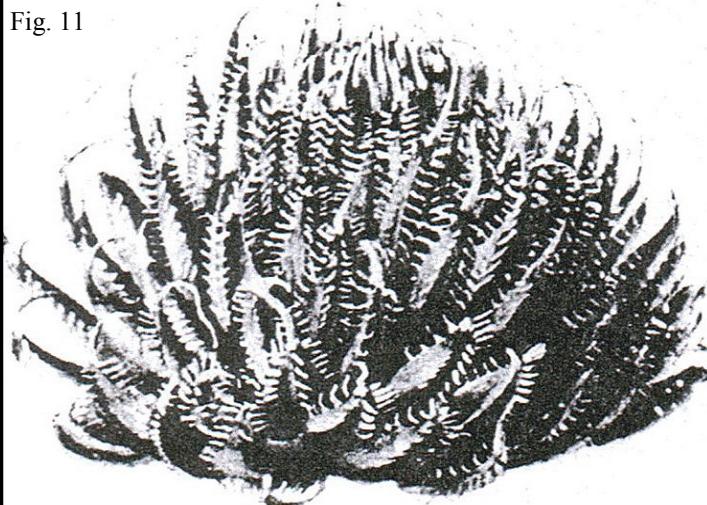
Fig. 10 <i>H. setata</i> Kew Gardens 181B	Lectotype

Table 7. Comparison of characters concerning "H. herbacea"					
Fig. No.		Fig. 12.	Fig. 13.	Fig. 14.	Fig. 15.
No.	Chracter	Boerhave 1720, t. 131	Bayer's "H. herbacea"	H. heidelbergensis v. minor	H. maraisii
1	leaf color	dark green	light green	dark green	dark green
2	prolificacy	proliferous	proliferous	proliferous	non-prolific
3	leaf shape	thin, long-lanceolate	thin, long-lanceolate	thin, long-lanceolate	more deltoid
4	leaf curve	recurve	incurve	recurve	recurve
5	leaf end	retused	not retused	retused	retused
6	marginal teeth	small, indistinct	prominent	small, indistinct	small, indistinct
7	rhizome-like shooting	present	absent	present	absent
8	peduncle	thin	thick/robust	thin	thin
9	flower size	small	large	small	small
10	floral lobes	not widely open	widely open	not widely open	not widely open

Table 8. Comparison of characters concerned with "H. obtusa"						
Group		Cooperi group		Cymbiformis group		
Present Fig. No.	Fig. 16.	Fig. 17.	Fig. 18.	Fig. 19.	Fig. 20.	Fig. 21.
Literature	Kew 1824	Baker 1871	Poelln. 1930	Scott 1985	Poelln. 1937	Poelln. 1938
Name	<i>H. obtusa</i>	<i>H. cooperi</i>	<i>H. dielsiana</i>	<i>H. blinkia</i> n.n. Hayashi	<i>H. umbraticola</i>	<i>H. cymbiformis</i> v. <i>obesa</i>
Type locality	?	?	Sheldon, Somerset East	Kat River (Lower Blinkwater)	Swartwater Poort	Idutywa
Note				Scott's <i>H. cymbiformis</i> v. <i>obtusa</i>	Bayer's <i>H. cymbiformis</i> v. <i>obtusa</i>	Breuer's <i>H. cymbiformis</i> v. <i>obtusa</i>
Basic color	bluish?	bluish		blue/green	greenish	
Colour in stress	(dirty brown)	purplish		brownish?	brownish	dirty brown
Prolificacy	solitary?	solitary		proliferous	solitary	proliferous
Leaf thickness	thick	thick		thick	thin	thick
Leaf tip awn	present	present		present	absent	present
Leaf tip shape	obtuse	acuminate	obtuse	obtuse		
Window demarcation	clearly separated	clearly separated		involved (not clearly separated)		
Vein in window	parallel	parallel (inconfluent)		irregularly confluent		
Vein interruption	interrupt	interrupt (not reach to apex)		not interrupt (reach to apex)		

Table 9. Illegitimate names by Bayer					
Illegitimate Name	Publication		Reason		Correct name
<i>H. maculata</i> v. <i>intermedia</i> (Poelln.) Bayer	Haworthia Revisited	(1999)	Art. 11.4		<i>H. intermedia</i> v. <i>maculata</i> (Poelln.) Esterhuizen (2003)
<i>H. pumila</i> (L.) Bayer	Haworthia Revisited	(1999)	Art. 53.1	later homonym	<i>H. maxima</i> (Aiton) Duval
<i>H. decipiens</i> v. <i>xiphophylla</i> (Baker) Bayer	Haworthiad 16(2): 63	(2002)	Art. 11.4		<i>H. xiphophylla</i> v. <i>decipiens</i>
<i>H. transiens</i> (Poelln.) Bayer	Haworthiad 16(2): 66	(2002)	Art. 11.4	later homonym	<i>H. transiens</i> (Poelln.) Hayashi (2000)

Fig. 11



Haworthia pallida

Fig. 16

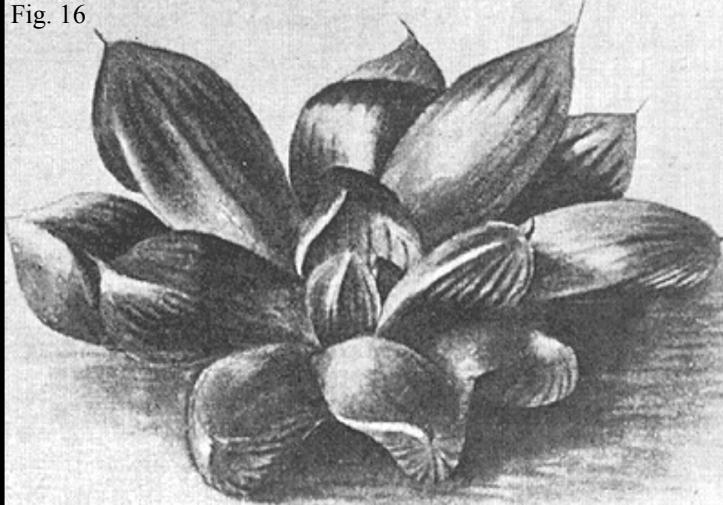


Fig. 16. *Haworthia obtusa*

Fig. 14



Fig. 14. *Haworthia atroviridis* Bosfontein MBB6531

Fig. 20



Fig. 20 *H. umbraticola*

Fig. 21

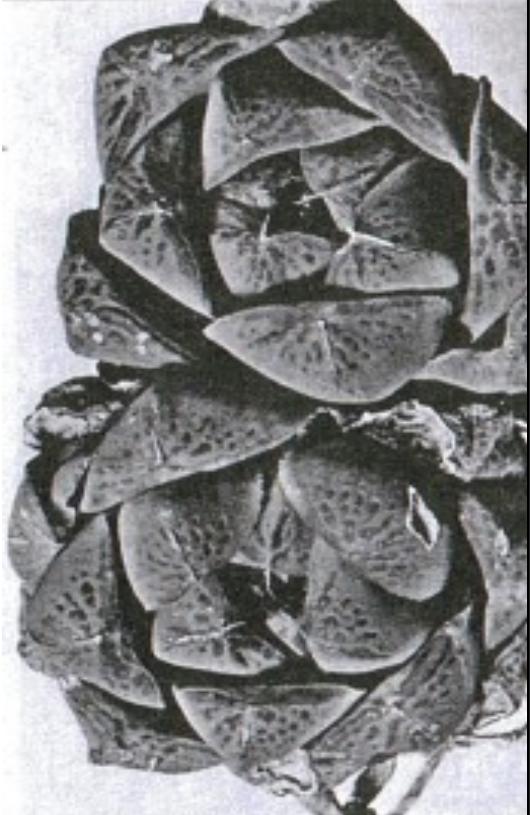


Fig. 21 *Haworthia cymbiformis* v. *obesa*



Fig. 13. Bayer's *Haworthia herbacea*



Fig. 14 *Haworthia cooperi*

(Continued from page 15)

concerning *H. obtusa* Haw. and *H. pilifera* Bak. Cactus & Succulent J. (US) 46: 166-170

Bayer, M.B. & E. van Jaarsveld (2001) Haworthia In Illustrated Handbook of Succulent Plants: Monocotyledons (Ed.) Urs Eggli Springer-Verlag, Berlin Heidelberg New York

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(Continued on page 19)

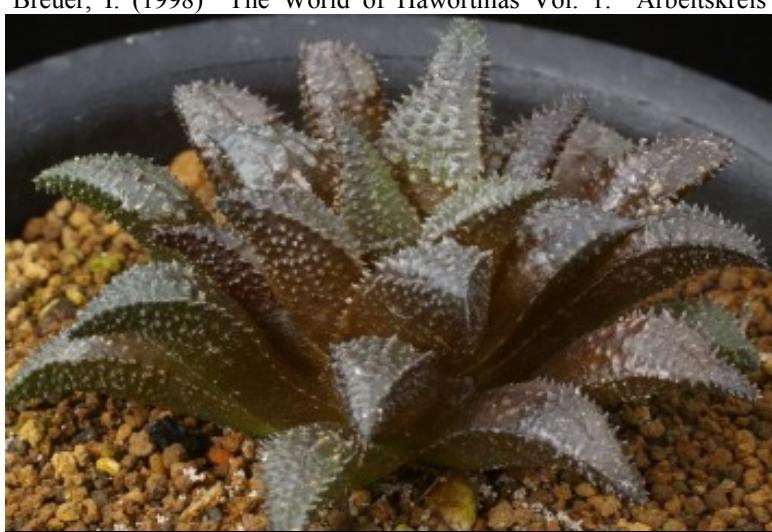


Fig. 15. *Haworthia maraisii* S. Rooiberg 05-109-1a



Fig. 19. *Haworthia blinkia*



Fig. 22. *Haworthia aristata*

Arbeitskreis für Mamillarienfreunde e.V. (AfM); Niederzier and Homburg/Saar
 Breuer, I. (2002) An Haworthia Species Concept Update Alsterworthia International; Preston
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 Scott, C.L. (1978) The correct application of the name Haworthia pumila (L.) Duval. Aloe 16: 44-46
 Scott, C.L. (1980) Diversity in the species Haworthia scabra Haw. and H. tuberculata von Poelln. Cact. Succ. J. (US) 52: 274-276
 Scott, C.L. (1985) The Genus Haworthia Aloe Books; Johannesburg.

Fig. 23. *Haworthia aristata* sensu Bayer

Fig. 24. *Haworthia integra* (*H. rycroftiana*)

Fig. 25. *Haworthia scottii*

Fig. 26. *Haworthia scabra*

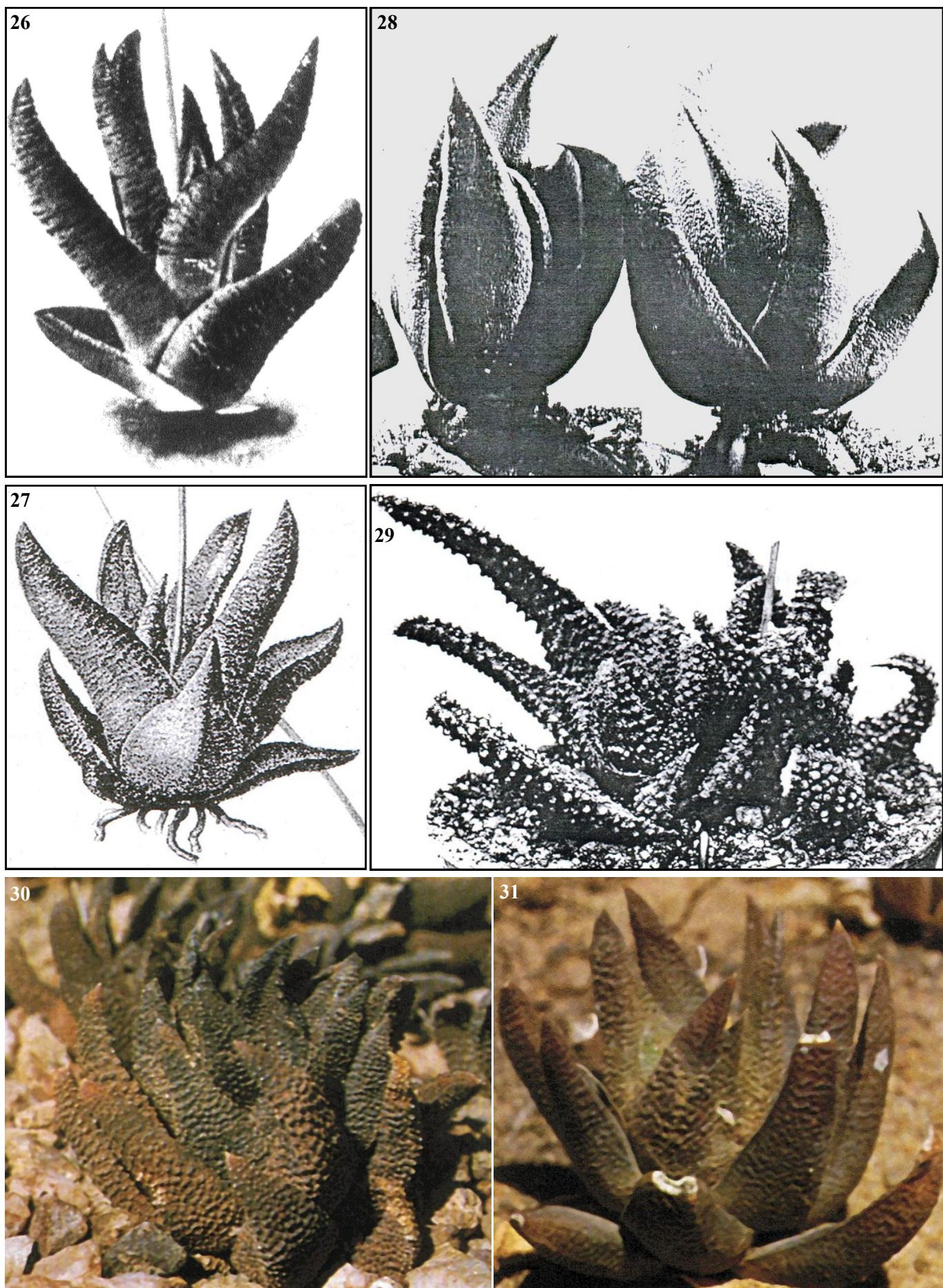
Fig. 27.

Fig. 28. *Haworthia morrisiae*

Fig. 29. *Haworthia tuberculata*

Fig. 30. *Haworthia scabra* sensu Bayer.

Fig. 31. Bayer's *Haworthia scabra* v. *morrisiae*





Aloe 'Hellskloof Bells' sibling by Brian Kemble.



Fig. 2 red. Fig. 1 paler.

***Aloe 'Hellskloof Bells'* Trager.** In the summer of 1991, Brian Kemble, noted student of the genus *Aloe*, created this uncommon hybrid of two species from South Africa's Mediterranean climate. The seed parent was the red-flowered form of *A. pearsonii*, a species many find difficult to grow and flower. It forms spectacular colonies of erect, columnar branches covered with red-blushed leaves, in the Hellskloof, a montane region of the Richtersveld in the N. Cape. The pollen parent was the related *A. distans*, an easier species from the coast with more freely produced, larger heads of flowers. John Trager suggested the cultivar name 'Hellskloof Bells', a play on the term "hell's bells". Webster's defines the term as "an interjection to indicate vexation or surprise". These are two species that would never have come together except by the hand of a creative hybridizer. A final allusion is to the pendent (bell-like) flowers. The five seedlings resulting from this cross are vegetatively quite uniform. Of the two clones illustrated here one is red flowered, the other paler. One clone distributed as ISI 2007-13 had not flowered at the time of distribution so the colour is not known. Time will tell where its flowers will fall on the colour spectrum.

***Aloe 'Firebird'* Trager.** A few rosettes of this plant had made their way into cultivation in the three decades since its creation, but the cultivar name 'Firebird' had not been officially published until the ISI distribution - **ISI 2008-7**. Shannon Lyons crossed *A. descoingsii* with *A. thompsoniae* to yield this floriferous plant with spotted recurved leaves. *A. 'Firebird'* looks like a slender-leaved version of the Bleck hybrid, *Aloe 'Cha Cha'* but beats it in producing conical racemes of narrow, urceolate, bright red-orange flowers almost unceasingly.

***Aloe 'Macho Pink'* Bleck.** This hybrid is another developed by John Bleck in the early 1980s but it is still not as widely distributed as it deserves. It is one of Bleck's "first four introductions" series developed for their desirable flowers which are produced nearly non-stop throughout the year. Its floriferousness is derived from its Madagascan parents, in particular *A. descoingsii* and *A. parvula*, while the narrow-campanulate flowers on slender, erect inflorescences and pinkish, white-tipped petals combine features of *A. albiflora* and *A. bellatula*. The four species in the parentage of this hybrid were crossed according to the formula: (*A. descoingsii* × *A. parvula*) × (*A. albiflora* × *A. bellatula*). The selection was made and named by Bleck under his number 1372A. Plants have been distributed under ISI 2008-9.

***Aloe zebrina 'Chapple's Yellow'* Trager.** This rare yellow-flowered variant stands out in the field of maculate aloes - a reference to their typically white-spotted leaves - that are difficult to distinguish from one another. In *A. zebrina* the leaves are arranged in compact rosettes that offset to form colonies, the leaf-spots are grouped into bands. The leaves dry naturally



Figs. 3 &4 *Aloe 'Firebird'*



Figs. 5 & 6 *Aloe 'Macho Pink'*

at the tips even under lush growing conditions, so this should not be a cause for concern in cultivation. The flowers are normally a dull pinkish colour. The selection offered here has been maintained in cultivation for more than 30 years by Anthon Ellert, first in the former Southern Rhodesia (now Zimbabwe) and then in Tucson, Arizona, since 2001. He acquired a start of the plant from the late Roy Chapple, a medical officer for Rhodesia Railways. Chapple collected some of this distinctive form during his journeys on the railways through the territory of Botswana, at the small village of Hildavale. Among its virtues, according to Ellert, are that this form grows equally well in full sun or part shade and will tolerate light frost. It has been distributed as ISI 2008-12.

×Astroworthia ‘Towering Inferno’ Trager. Garden hybrids of *Astroloba* and *Haworthia* are not uncommon, but most are rather muddy-looking mongrels without the distinctive attractions of either parent. **×Astroworthia ‘Towering Inferno’** is an exception with its stacked rosettes of stiff, narrow-triangular, pointed leaves that blush a fiery reddish colour. The precise parentage is unknown, but appears to include one of the smooth-leaved *Astroloba* species with similar stacking leaves. *Haworthia coarctata* may have contributed its colourful foliage and a hint of tubercles on the leaf-surfaces. This cultivar came to the Huntington Botanical Gardens in Jan., 2001 in the collection of Los Angeles resident Stan Green. It was propagated and then distributed as ISI 2008-13.

Gasteria ‘Bronze Knuckles’ Trager. Gasterias are often indiscriminately hybridized in southern

California by local hummingbirds. Therefore, open-pollinated seed (as opposed to that from controlled pollination) is rarely worth keeping or sowing. When set on a desirable species like *G. armstrongii*, however, one might be tempted to try some. That is the history of this new cultivar which appears to be a hybrid of *G. nitida* var. *armstrongii* and *G. bicolor* var. *liliputana*. The latter species lends its glossiness and dwarf, offsetting habit to the dark foliage-colour of the former. This miniature clumper is deep green in shade but can blush a lovely bronze colour with more light, hence the cultivar name. The rosettes of recurved leaves are at first distichous but become rosulate. *Gasteria ‘Bronze Knuckles’* are divisions of one of a batch of mostly true seedlings from seed harvested by one of our more pugnacious volunteers whose wings beat nearly as fast as those of the pollinator. It was distributed under number ISI 2008-20

Acknowledgment.

Photographs supplied by John Trager.

Text adapted from notes supplied by John Trager.

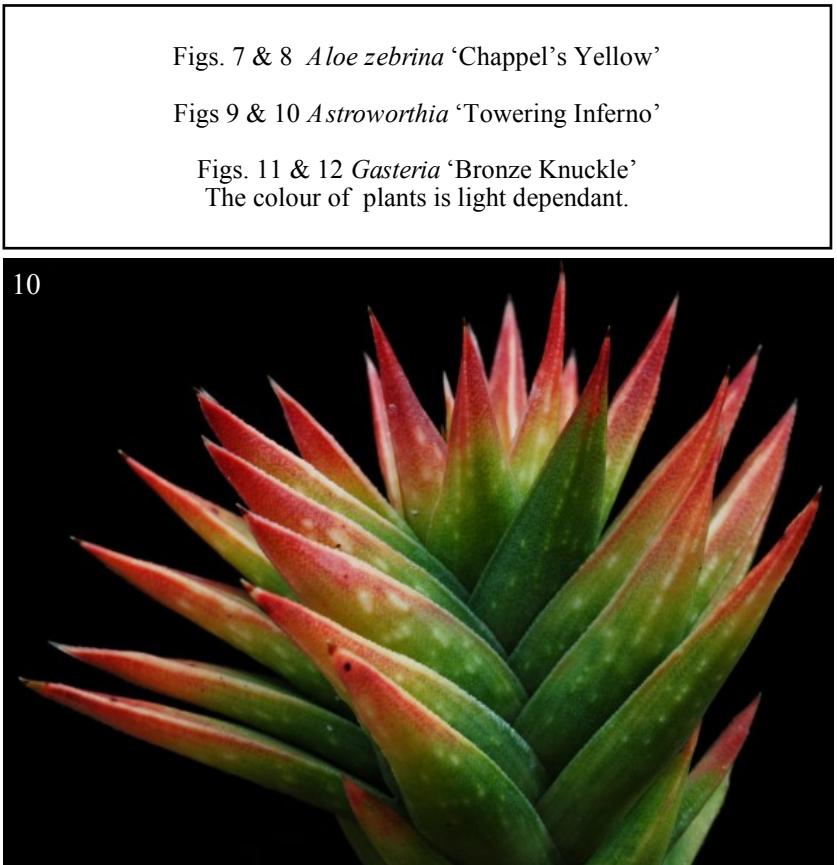
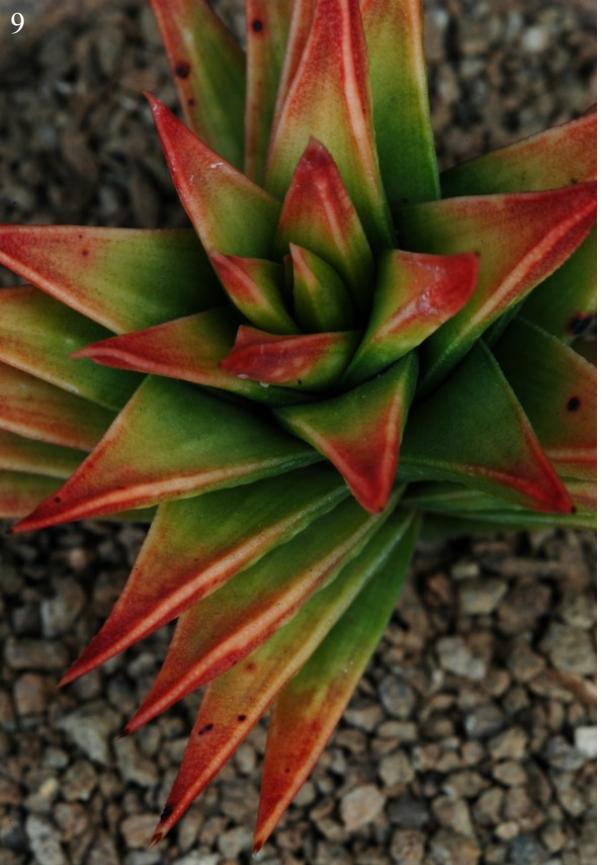


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Figs. 7 & 8 *Aloe zebrina* 'Chappel's Yellow'

Figs 9 & 10 *Astroworthia* 'Towering Inferno'

Figs. 11 & 12 *Gasteria* 'Bronze Knuckle'
The colour of plants is light dependant.

11



12



Haworthia Update

Essays on Haworthia Volume 4.

Bruce Bayer



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Bruce Bayer has indicated that Update 4 brings his writings on Haworthia to a close, except perhaps for occasional articles. We look forward to reading them.



HA0092 *Haworthia fasciata* x *Haworthia marginata*

