ALSTERWORTHIA INTERNATIONAL

THE SUCCULENT ASPHODELACEAE JOURNAL

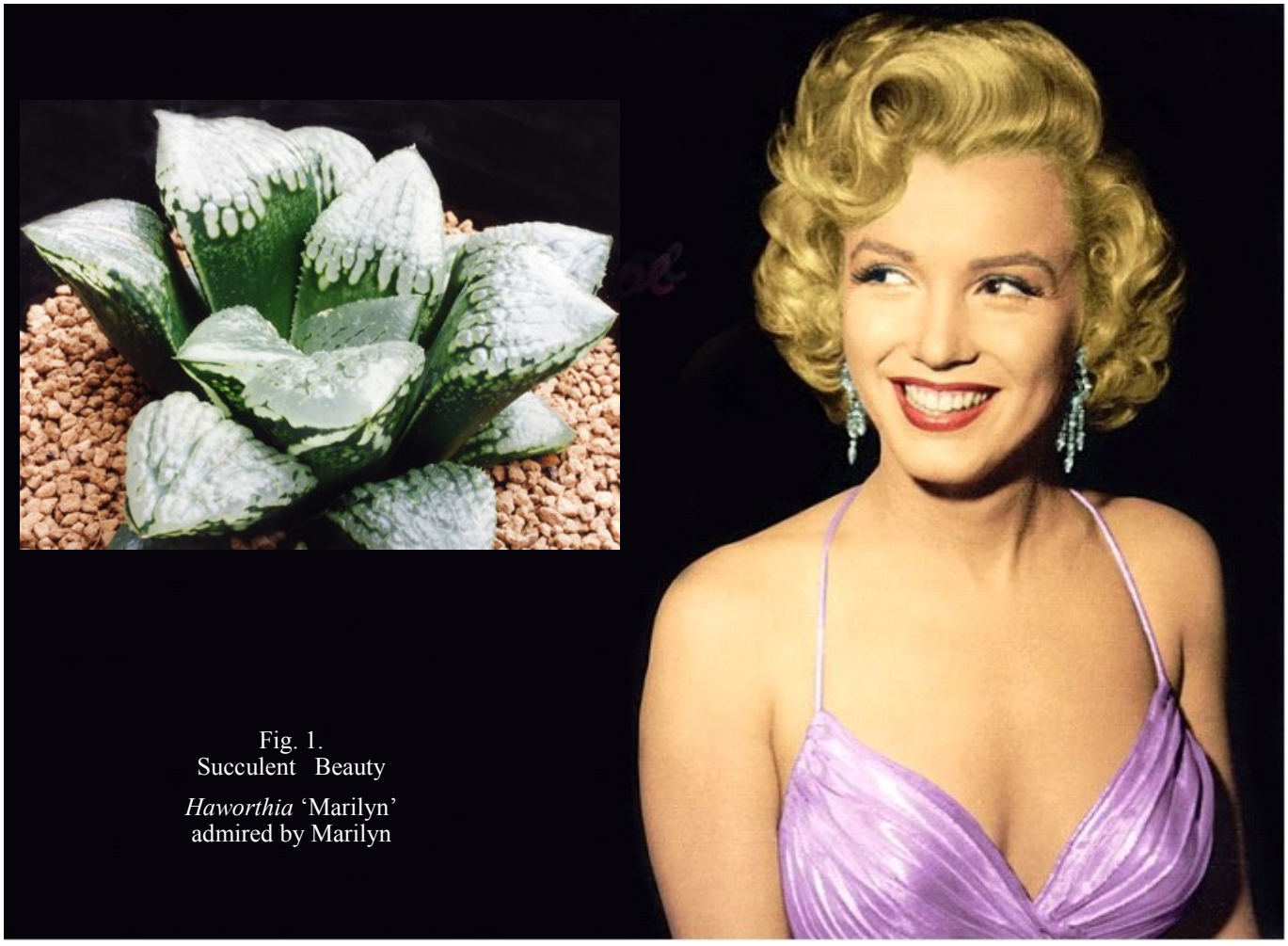


Fig. 1.
Succulent Beauty
Haworthia 'Marilyn'
admired by Marilyn

CONTENTS

Volume 6. Issue 2. **July 2006** **ISSN: 1474-4635**

More about Haworthia on Kaboega.

M B Bayer, PO Box 960, Kuilsriver 7579, RSA.

Recently I was invited by our national botanical body (SANBI) to contribute the small section on Haworthia for a published flora for the Eastern Cape. This exercise requires someone to provide a botanically reasonable assessment of the species of *Haworthia* which grow in that geographic area. It is very easy to bandy names about until one is faced with this ultimate challenge. I do not think it is possible for anybody to produce such a synopsis on the style of the list of plant species of South Africa as published in Strelitzia 14. A classification is simply a reflection of sampling intensity and the experience, inclination and competence of the observer, and that listing in Strelitzia is not realistic in respect of the collecting record, or of the literature, and of the authors. I have for many years felt that a true botanical dispensation will result in a much shorter species list than any collector would like to acknowledge. Unfortunately all the accumulating evidence suggests that this is indeed the case.

Kaboega is a set of farms on the northeast of the Zuurberg Mountain range, north of Kirkwood and of the Addo National Park. I have already written about the haworthias that occur there in Haworthia Update Vol.1. There is also an article in Aloe 40:10 (2003) in which there is a discussion of the variation of those haworthias as related to geology and topography.

A short time ago I was again at Kaboega and took the accompanying photographs to illustrate the kind of problem variation presents. What name does one use for these variants in the context of any list of names that one can conjure up? My contention is that they are all, in any sense of objective reality (if there is such a reality or any reality at all), variants of one species and the most appropriate name in terms of the historic record is *H. cooperi*. Thus even the plants in the record MBB6903 from the western boundary of Kaboega (Figs. 5) are this species even though they may bear a closer superficial resemblance to *H. cymbiformis*. The plants in MBB6942 are no doubt part of the continuum which extends to my conception of *H. aristata,* which occupies the plains territory to the north of Kaboega. It does not to my knowledge ever occur together with any other version of *H. cooperi* and thus may also be simply (complexly!) a variant of that species. Curiously Figs. 4 are pictures in the Kaboega continuum of the plants illustrated in Figs. 2 and 5, and particularly Fig. 4c could be taken to be *H. bolusii* var *pringlei* as it occurs at Ripon. The question stands "Is *H. bolusii* var. *pringlei* perhaps also simply an ecotypic variant of *H. cooperi*?" and the one that cannot be answered with any certainty either is if *H. bolusii* var. *blackbeardiana* is not perhaps also an extension of *H. cooperi*.

Photographs, pages 2-5, by the author.

Fig. 1. *Haworthia cooperi*. Klipfontein. MBB6940.
Fig. 2a-c *Haworthia cooperi.* E. Vyeboomfontein MBB7486.
Fig. 3a-3b. *Haworthia cooperi.* DePlaat Weir MBB6942.


2b


2d


3a


3b

Fig. 3c-e. *Haworthia cooperi.* DePlaat Weir MBB6942. Fig. 4a - c. *Haworthia cooperi.* Dassieklip. MBB6943
Fig. 5a-c *Haworthia cooperi* Wilgefontein. MBB6903


4d


4c


5a


5b


5c

Haworthia maraisii in the West.

M. B. Bayer.

Figure 1 below and figs 2 & 3 page 7 are pictures of *Haworthia maraisii* from the most south-westerly populations known. *Haworthia herbacea* is very abundant nearby on Dwyka Tillite rock at slightly lower altitude and in Karoid Succulent communities, whereas the *H. maraisii* is in Dry Mountain Fynbos bordering on Renosterveld and in Witteberg quartzites. Both sites are characterized by skeletal soils. A few kilometres to the west is Lemoenpoort and two differing populations of *H. pubescens* var. *livida*. There is a further population of a plant which I identify as *H. maculata*, again a few kilometres westward, and these plants need to be compared with *H. mirabilis* (var. *depauperata* or var. *diversicolor* of Von Poellnitz at McGregor). Unfortunately the picture is very complex indeed and a great deal of fieldwork shows that there is simply no distinction between *H. maraisii* and *H. mirabilis* - in fact the problem extends much further than that. Classification into species is simply a question of conception based on an individuals experience and knowledge of the plants, and it seems that the more one learns the less able one is to define boundaries. A classification may in fact be nothing more than a reflection of the sampling intensity made at a particular point in time.

I should perhaps try to explain to readers this problem of the typical variety one reader seems to have, and recently expressed and expanded on in the journal of the Haworthia Society, Haworthiad. I have used a species name to represent a population or many populations of plants. Thus when a variety (which may be just one or a few individual plants of that species) is described, this automatically results in a typical variety. The old usage was for this to be var. typica, but now it takes the name of the species. The implication is that all other plants of the species other than that single new variety fall under the name of the species - which is patently and obviously, given the nature of variability, nonsense. Then of course this explanation may perhaps be understood only by someone who has experienced the problem. My feeling is that many botanists, while highly competent and experienced, nevertheless do not see and experience enough to know just how intractable the problem actually is. The problem cannot be managed by the facile conduct of experiments which could be very limited in terms of scope and generate more new problems than they solve. My hybridization experiments with stapeliads and my fieldwork on *Oxalis* prove that.

Photograph, pages 6 & 7, by the author.

Fig. 1. *Haworthia maraisii* Droogeriviersberg

Haworthia Updates 2 & 3.

The Editor.

Bruce Bayer's Haworthia Updates 2 & 3 have been long expected and long in print. Too long in fact, but with the benefit that some of the newest findings and literature can now be included. Bruce has continued, and still continues, with his field research, which never ceases to bring to light new information about haworthias. Since Haworthia Revisited, he has added nearly 1000 new population records and much of this new information is now presented in relation to what has gone before. In Alsterworthia International we are honoured and delighted to publish the revised Updates 2 & 3. Bruce has indicated that he does not wish to take any percentage from the sale of the Updates and Alsterworthia International will, in accordance with its non-profit making policy, make these two publications available to book dealers, at about cost price. A guide price will be fixed for the public, sales to which will be handled almost exclusively by book dealers. Alsterworthia International members will be entitled to a discount - obtainable only from Alsterworthia International. One copy per member.

Update 2 is fast reaching the printing stage and Update 3 will not be far behind. They will be printed on A4 gloss art paper and bound in a card cover. There will be *many* photographs (well over 1000 in the two volumes), usually 8 to a page, but sometimes less, which demonstrate variability over geographical areas. The photographs are referenced to location and topography. They record information which far exceeds that of practical herbarium records, consequently they will be of value, and indeed essential, to anyone engaging in the taxonomy of the genus at whatever level and especially to the aficianado, grower and collector. Some pictures are substandard for a coffee-table presentation, but these are far in the minority. They have been retained as the images still convey useful, broad information and it is not possible, for a variety of reasons, to retake them.

The two volumes will include 33 essays. Because of their often independent nature, the large number of illustrations and maps are numbered sequentially from 1 for each chapter. The total number of pages is expected to approach 400, so each update will have approaching 200 pages. Each will have an independent index, and a contents table that applies to both updates. Some of the chapters have previously been published elsewhere but, because of the unfortunate fragmentation of the literature, Bruce would like them presented in a single comprehensive publication to make them all more accessible and contextually meaningful. Often there are addenda to present additional argumentation and explanation. There is emphasis on taxonomy as a means to understanding and knowing plants - as opposed to the general view that taxonomy is petty argumentation about names. Full availability and price details will be published in the November Alsterworthia International, but you can register your interest now at < hmays@freenetname.co.uk > and obtain details by e-mail attachment as soon they become available.

Colour-illustrated experiences of two expeditions for succulents in central, south and sothwestern Madagascar. Alsterworthia International Special Issue No. 8

Because of the large number of colour photographs and the weight of this publication, the true cost of publication and distribution was higher than the price charged. A donation was used to keep the price down. The demand for this publication has now exhausted the donation. The price has, therefore, been increased by £1.00. The member's price is now £7.50 inclusive of uninsured, standard postage.

Figs. 2 & 3. *Haworthia maraisii* Droogeriviersberg

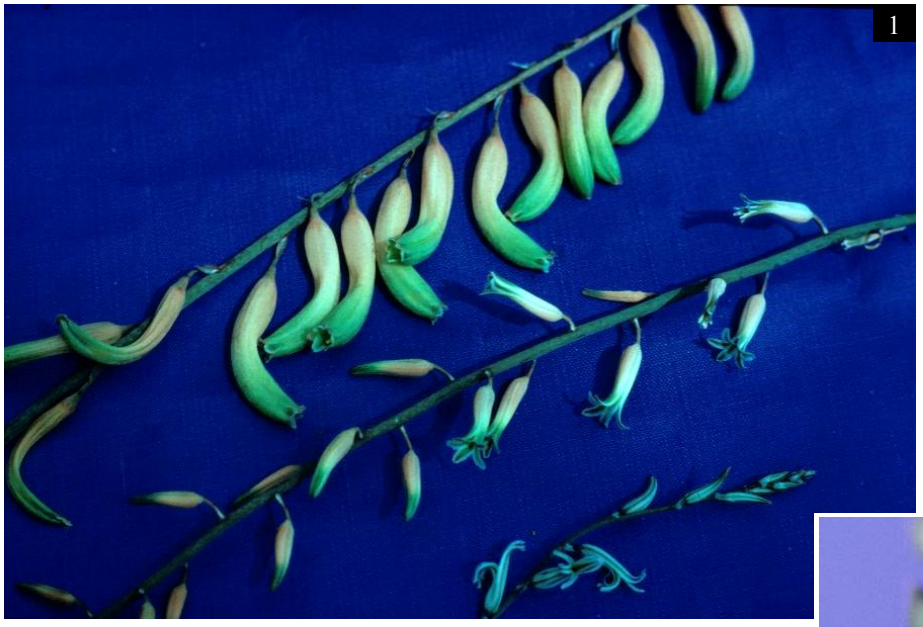


Fig. 1.

Top.
Gasteria flowers.

Centre.
×*Gasterhaworthia* flowers

Bottom.
Haworthia flowers.

Fig. 2.

× *Astroworthia bicarinata.*

Distributed as

Astroloba bicarinata
ISI 1990-47

Rooted cuttings of plants collected in 1981
5km SE of Laingsburg, SA.

Fig. 3.

×*Gasterhaworthia*
'Bayfieldii'

Plant left.

Salm-Dyck plate right.

Figs. 1 & 3. Gordon Rowley.
Fig. 2. Harry Mays.

INTERGENERIC HYBRIDS IN THE ASPHODELACEAE SUBFAMILY ALOOIDEAE

Gordon Rowley
1 Ramsbury Drive, Earley, Reading, RG6 7RT

SUMMARY.
Gordon Rowley provides a list of 39 proposed nothogeneric names, 13 of which are valid and usable under a concept of 6 basic genera. One name, ×*Gasterlirion* Mays & Rowley, is newly proposed to replace the invalid ×*Gastrolirion* Walther.

Generic concepts within the Alooideae (Aloaceae of some authors) have long been a source of controversy (Rowley 1976). Salm-Dyck was the last major figure since Linnaeus to treat all the species as one genus, *Aloe*. The pros and cons of subsequent systems will not be discussed here, where the 6 genera recognised in the Illustrated Handbook of Succulent Plants (Eggli 2001) are taken as gospel: *Aloe* with 446 species, *Haworthia* with 62, *Gasteria* with 17, *Astroloba* with 6 and *Chortolirion* and *Poellnitzia* with 1 each. Very likely there will be changes in the future, especially when molecular evidence comes along. Here, then, is the current line-up:

Nothogenera (hybrid genera) are formula names covering plants with parents assigned to different genera: a rare occurrence in nature. The names are mechanically coined from those of the parent genera, taking "the first part or the whole of one, the last part or the whole of the other (but not the whole of both) and, optionally, a connecting vowel." (I.C.B.N. Art. H.6.2, Greuter 2000). Unfortunately some early names, acceptable at the time, had to be replaced as they did not precisely conform to this ruling. Thus ×*Gastrolea* had to be replaced by ×*Gasteraloe*. ×*Gastrolirion* has one "r" too many, and ×*Allemptauminia*, another defaulter, was launched with a mysterious extra "m". Such are the Procrustean workings of the Code!

ACCEPTED GENERA	REJECTED GENERA
Aloe L.	*Apicra* Haworth (Referred to *Astroloba)*
Astroloba Uitewaal	*Aloinella* Lemée non Cardot
Chortolirion Berger	*Chamaealoe* Berger
Gasteria Duval	*Guillauminia* Bertrand
Haworthia Duval	*Lemeea* Heath
Poellnitzia Uitewaal	*Leptaloe* Stapf
	Lomatophyllum Willdenow (Referred to *Aloe*)

For combinations involving three or more genera the names could become unwieldy, so an alternative is permitted by combining the name of the raiser or other associated specialist with the ending *-ara*. Examples of both types will be found in the following list.

CATALOGUE OF NOTHOGENERIC NAMES

Names in **bold type** are validly published and correct for the six genera currently accepted here.

Names in normal (Roman) type are validly published, but usable only if the included segregate genera were to be resurrected.

Names in *italic type* are not usable and to be rejected.

×Alamaealoe Heath in Calyx 3(4):153, 1995. (Aloe x Chamaealoe).

×*Alchamaloe* Rowl. in Nat.Cact.Succ.J.22:74, 1967. Referred to ×Alamaealoe, q.v.

×*Aleptoe* Rowl. in Nat.Cact.Succ. J.22:74, 1967. Referred to ×Aloptaloe, q.v.

×**Algastoloba** Cumming in Haworthiad 13(l):20, 1999. (Aloe x Astroloba x Gasteria). At least 2 cultigens.

×Allauminia Rowl. in Nat.Cact.Succ.J. 22:74, 1967. (Aloe x Guillauminia).

×Allemeea Heath in Calyx 3(4):153, 1995 (Aloe x Lemeea).

×*Allemptauminia* Cumming in Bull.Afr.Succ.Pl.Soc. 9:40, 1974. Referred to ×Alleptauminia, q.v.

× Alleptauminia Heath in Calyx 3(4): 153, 1993 (Aloe x Guillauminia x Leptaloe).

× *Aloella* Rowl. in Nat.Cact.Succ.J.22; 74, 1967. Referred to ×Leminia, q.v.

×**Alolirion** Rowl. in Nat.Cact.Succ.J.28:7, 1973 (Aloe x Chortolirion). A single report of Aloe striatula x Chortolirion angolense.

×**Aloloba** Rowl. in Nat.Cact.Succ.J.22:74, 1967 (Aloe × Astroloba). At least 4 cultigens.

×Aloptaloe Heath in Calyx 3(4):153, 1993 (Aloe x Leptaloe).

×**Alworthia** Rowl. in Nat.Cact.Succ.J.28:7, 1973 (Aloe x Haworthia). Difficult crosses to achieve, and few authentic cultigens.

×**Astroworthia** Rowl. in Nat.Cact.Succ.J.22:74, 1967 (Astroloba x Haworthia). A single indigen and few cultigens.

×*Apworthia* Poelln. in J.Roy.Hort.Soc.68:259, 1943 (Apicra x Haworthia). Referred to ×Astroworthia, q.v.

×**Bayerara** Cumming in Haworthiad 13(1):20, 1999 (Aloe x Gasteria x Haworthia). At least one cultigen.

×Chamaeleptaloe Rowl. in Nat.Cact.Succ.J.28:7, 1973 (Chamaealoe x Leptaloe).

×Chamaeloba Cumming in Bull.Afr.Succ.Pl.Soc.9:36, 1974 (Chamaealoe x Astroloba).

×Chamaeteria Cumming in Bull.Afr.Succ.Pl.Soc.9:

36, 1974 (Chamaealoe x Gasteria).

×**Cummingara** Rowl. in Haworthiad 13(3): 115, 1999 (Gasteria x Haworthia x Poellnitzia). Two cultigens.

×Gaslauminia Heath in Calyx 4(4):146, 1994 (Gasteria x Guillauminia).

×**Gasteraloe** Guillaumin Bull. Mus. Hist. Nat. Paris 3: 339-340, 1931 and 4: 1031, 1932 (Aloe x Gasteria). Formerly known as ×Gastrolea, this is the largest nothogenus with at least 21 named nothospecies as well as numerous cultivars (Newton in Eggli 2001). Many remain fertile and have been further interbred.

×**Gasterhaworthia** Guillaumin in Bull.Mus.Hist. Nat.Paris 3: 339 1931 (Gasteria x Haworthia). At least 5 cultigens, 4 formally named as nothospecies.

×**Gasterlirion** Mays & Rowley nothogen. nov. Chortolirion x Gasteria. Replacement for ×Gastrolirion Walther which contravenes Art. H.6.2. The single representative described in Cact.Succ.J.(U.S.)5:467-468 is here treated as a cultivar: 'Orpet,'.

×*Gastrolea* Walther in Cact.Succ.J.(U.S.)2:306, 1930. Referred to ×Gasteraloe, q.v.

×*Gastrolirion* Walther in Cact.Succ.J.(U.S.)5:467, 1933. Referred to ×Gasterlirion, q.v.

×**Gastroloba** Cumming in Bull.Afr.Succ.Pl.Soc. 9:36, 1974 (Astroloba × Gasteria). One indigen and at least 1 cultigen.

×*Gasworthia* Gates in Jubilee Retail Price List (Gates Cactus Inc.), back cover, 1955. Referred to ×Gasterhaworthia, q.v.

×*Haworthio-Gasteria* Kondo & Megata ex Megata in Seiken Ziho 2: 69-82, 1943. Referred to ×Gasterhaworthia.

×Leminia Heath in Calyx 4(4):146, 1994 (Guillauminia x Lemeea).

×*Leptaloinella* Rowl. in Nat.Cact.Succ.J.28: 7, 1973. Referred to X Allemeea. Aloinella Lemée, one parent, is a later homonym of Aloinella Cardot, and was renamed Lemeea Heath.

×Leptauminia Rowl. in Nat.Cact.Succ. J.22:74, 1967 (Guillauminia x Leptaloe).

×Lomataloe Guillaumin in Bull.Mus.Hist.Nat.Paris 3:339-340, 1931 (Aloe x Lomatophyllum).

×Lomateria Guillaumin in Bull.Mus.Hist.Nat.Paris 3:339-540, 1931 (Gasteria x Lomatophyllum).

×Lomatoloba Cumming in Bull.Afr.Succ.Pl.Soc.9: 35, 1974 (Astroloba x Lomatophyllum).

×**Maysara** Cumming in Haworthiad 13(3):115, 1999 (Astroloba x Gasteria x Haworthia). One cultigen and several experimental crosses recorded by Cumming (2006)

×**Poellneria** Rowl. in Nat.Cact.Succ.J.28:7, 1973 (Gasteria x Poellnitzia). One cultigen.

×*Rowleyara* Cumming in Haworthiad 13(l):20, 1999, non ×Rowleyara Heath in Calyx l(2):36, 1992. Referred to ×Maysara.

×*Smithara* Cumming in Haworthiad l3(l):20, 1999, non ×Smithara Gar. & Sweet in Bull.Mus.Leafl.Harv.Univ.21: 180, 1966. Referred to ×Cummingara.

Intergeneric hybrids have fared badly in the botanical press in the past. Even the exalted I.H.S.P. treats them patchily, with notable omissions. A ×*Gasterhaworthia* is neither a *Gasteria* nor a *Haworthia*, and so gets left out of books on either genus. Yet bigeners have much scientific interest beyond their immediate appeal (or repulsion) to collectors.

First, let us analyse the findings in the light of the gene-flow diagram (Fig. l, page 11).

There is a high degree of intercompatibility between what are regarded as 6 separate genera. The gaps, such as that between *Chortolirion* and *Poellnitzia*, less-than-common genera in cultivation, may simply mean that no-one has tried to cross them. Further, the existence of four trigeneric combinations proves that the F_1 bigeners are still sufficiently fertile to permit further crossing - an unusual situation for wide crosses (Rowley 2002). Indeed, the Alooideae are among the few groups of plants that exhibit such interfertility - "comparium" is the word used to define such a complex. Other examples are in the Cactoideae and other major groups of succulents, as well as orchids and grasses - all highly specialised "climax groups" in which basic flower structure has diverged less than the plant body, at least in setting up genetical barriers to outcrossing.

Of course, another interpretation is that the taxonomists have got it all wrong and created too many species and genera. This is the viewpoint of supporters of the biological species concept, where barriers to interbreeding define species boundaries. This works well in the Animal Kingdom, where mobile organisms choose their own mates, but never found favour among botanists - even if we knew the breeding potential of every plant.

Nearly all the plants falling within these nothogenera are cultigens, that is, plants arising in gardens from chance or controlled hybridisation. ×*Gasterhaworthia squarrosa* and ×*Gastroloba apicroides* were described (as gasterias) by Baker in 1880 from plants at Kew that may have come from the wild, but their origin is unrecorded. One certain example of an indigen, a plant born in the wild, is ×*Astroworthia bicarinata* from the Western Cape where populations of *Astroloba corrugata* and *Haworthia maxima* have intermarried. Hybridisation in the wild is less likely if the respective flowers have different opening times, or different pollinators. Thus *Haworthia* flowers are more or less zygomorphic and typically attractive to bees and butterflies; the bright red or yellow tubular blooms of Aloe are mainly visited by birds. But at yet we still

have too little data from the field to gain a clearer picture of pollinator preferences.

Active breeding of new hybrids in Europe seems to have begun in the 1890's when succulents were peaking in popular favour and novelties were in demand. F. Radl described a number of new ×*Gasteraloe* crosses and other bigeners in the German Society journal in 1896. They were raised by Beguin and offered for sale the same year by the Erfurt nursery of Haage & Schmidt, listed under *Aloe*. But there were already in cultivation at least three older bigeners, the best documented of which is ×*Gasterhaworthia bayfieldii,* described and beautifully illustrated by Salm-Dyck in 1842, and the same clone is still in cultivation today (Rowley 2002).

The second half of the twentieth century saw an increase in the number of bigeners as growers sought compact, dwarf plants for indoors or small glasshouses, combining the distinctive foliage of *Gasteria* with the smaller aloes. It was even found possible to cross South African gasterias with Madagascan dwarf aloes to create attractive cultivars, as B.J.M. Zonneveld has shown. David Cumming, another successful hybridiser, came up with the first trigeneric crosses in 1999.

REFERENCES

Eggli, U. [Ed.] (2001) Illustrated Handbook of Succulent Plants - Monocotyledons. [I.H.S.P.].

Cumming, D.M. (2006) Poellnitzia Uitewaal: Inferred relationships from limited hybridisation. Alsterworthia International 6(1)13-16.

Greuter, W., et alii. (2000) International Code of Botanical Nomenclature [I.C.B.N.] Regn.Veg.138. A new revision is in the press.

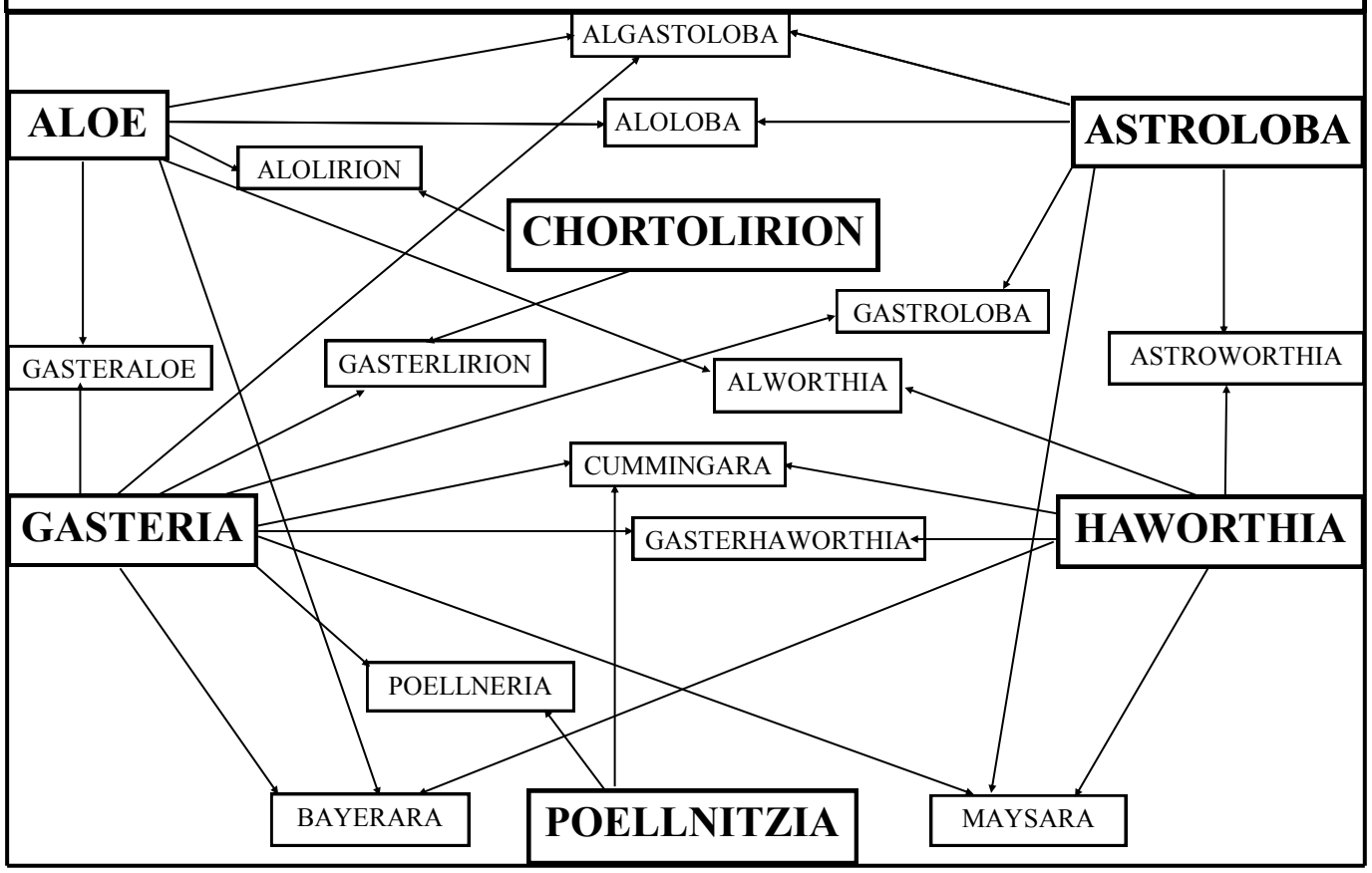
Radl, F. (1896) Neue Aloe-Hybriden. Monats.f.Kakt.6: 23-24, 27.

Rowley, G.D. (1976) Generic concepts in the Aloineae [Alooideae], Nat.Cact.Succ.J. 31: 26-31, 54-56.

--------- - - (1982) Intergeneric Hybrids in Succulents. Nat. Cact.Succ.J.37: 2-6, 45-49, 76-80, 119.

--------- - - (2002) Wide crosses among Succulent Plants. Cactus & Co. 6(4):235-248.

Fig. 1. Gene flow diagram.



Why Updates 2 and 3.

M. B. Bayer.

My earliest memories as a child in Namibia include the excursions into the field with my father. That is where I have always been comfortable and that is where my interest lies. *Haworthia* has always been a special fascination, but that is not the only focus of my liking for plants and nature. I fortuitously became an entomologist and then worked as a square peg in a round hole in this role for many years. Eventually the pressure became too much and I found a place at the Karoo garden at Worcester where for the first time I felt comfortable with a correspondence of interest and aptitude. I met Col. Scott and we made a happy agreement that I would do the field work and he would do the writing. However, it became clear that our perceptions and understanding were quite different. As it was also long evident that the information in the literature did not help to explain and facilitate understanding of *Haworthia* as I was seeing it and experiencing it. This is the simple issue of my early writing viz. to simply clarify my own mind, find some order in the formal herbarium record, relate this to real-life contact with nature, and record all this for other interested people.

I did not aspire to formal botanical writing and to deal with the problems of nomenclature. That I eventually did so was by the persuasion of friends and the observation that if I did not, someone else with even less competence would do so with severe injury to the subject matter. That is how Haworthia Revisited came to be written. During the writing period it also became increasingly obvious that there really was not enough known and any new populations being found were simply not conforming smoothly and easily to the known. Simultaneously other writers proved my fears of damage to the subject matter to be true. This was surprisingly not only at the grower and collector level, but also in the professional botanical literature. There are clearly huge differences among interested parties in terms of conception and understanding of taxonomy, nomenclature, variability of the plants and all that goes with trying to tack a name to a plant so that it means and brings something useful to our understanding.

My contact with Kobus Venter and my personal situation were such that I was enabled to get into the field more often and more widely. I was thus able to research and explore problem areas more thoroughly. The first product was Update Vol. 1 which was published by Umdaus with the understanding that more would follow. Sadly the venture did not seem to have any commercial merit and writing about *Haworthia* is not a field that Dan Brown would consider likely for a blockbuster. Umdaus were not very forthcoming about print or sales numbers or even about how the book was received. The manuscript of Update 2 must have lain about their offices for two years before I claimed them back for Kobus to edit. Due to other heavy commitments Kobus had to relinquish the job and I had to reclaim it and do my own onerous editing and checking. If nothing else it did make me more sympathetic to Umdaus and my readers. At this stage Kevin Belmont in the Philippines expressed an interest in publishing the essays and might well have done so if Harry Mays had not been willing.

Update 2 and 3 comprises 33 more-or-less independent essays dealing with a range of topics, sometimes discussing single populations or single species, and sometimes complex relationships which the closing chapter "The Superspecies Proposal" covers. There are also chapters which confront critics and commentators. Several chapters are reprinted from other publications. This is done for three reasons a) to correct errors, b) to answer criticisms and c) to overcome what I refer to as fragmentation of the literature. There are so many journals available and my writing covers such a long time span, that readers will be hard pressed to appreciate the context of essays. G. G. Smith was exacerbated to the point of total resignation by the frustration of contrary writing in the short time span of 6-7 years that he wrote. I sympathise fully and consider him lucky that he did not have to live with that frustration for 45 years as I have done. If I think of the confusion that existed in the Compton herbarium record in 1969, and the order that prevails there now, I feel I have accomplished something. It is very difficult to convey the fact to people that there are writers out there who have effectively taken the opportunity of a clean slate to start a new slide to chaos.

In Update 2 and 3 I have been at pains to explain that taxonomy has to meet the needs of science and botany. Collectors, growers and their suppliers need to recognize that the nomenclatural system and its Latin names are for that purpose and that primary purpose. If the scientists and botanists are not a lot more thorough and competent they promote a climate in which the incompetent can sport themselves. This has happened in *Haworthia.* I do not doubt that I can be seen to have benefited in this hiatus. I would like detractors to know that I would hardly have waited from 1962 to 1996 to have formally entered the fray had there been a competent botanist to do the work. It is most gratifying that this year has seen a request from the South African Institute of Biodiversity for me to generate the synopsis of *Haworthia* for a proposed Flora of the Eastern Cape. I would like to record my especial appreciation to the Director Research, Prof. G. F. Smith, for initiating and facilitating this. I would also like to record my appreciation to the staff of the Compton herbarium where the collection follows my taxonomic treatment, and to the Haworthia Society and its committee who also base their show schedule on Haworthia Revisited.

Updates 2 and 3 include over 1000 photographs. A picture is more meaningful than words and I have tried to capture the essence of variation of plants and

populations in pictures. My camera work is not of a professional and some pictures certainly do not stand on their own. I have left them there because they are still as adequate as a tacky piece of dried material in the herbarium can be to convey a meaningful impression. What is discouraging is that quite apart from real difference, there is the change that is wrought in a single plant by virtue of its growing conditions. The plus points to this problem is the huge opportunity for journals and growers to generate pictures to highlight interesting characters and aspects of their plants.

I am not convinced that my answers are complete. Derek Tribble, whom I understand was a founder member of the Haworthia Society, wrote after his travels in South Africa, of the many mountains and the unknown plants and secrets they surely held. I apologise that I was so critical of this comment. However, my criticism was generated by the nonsense treatment of all those plants we already know and my expectation that exploration would simply lead to a proliferation of another unrelated and mindless set of names. My exploration confirms what Tribble conjectured and my latest essays often deal with complexity in very small areas. Often I have turned up new and problematic populations in very accessible situations and can confirm that indeed there is a great deal still more to discover. Despite this, I must say that it has been possible to largely accommodate new finds within the 1966 revision without undue stress on the taxonomic structure. The names meet the needs of a structured system which is compatible and comparable with the standard herbarium treatment of other genera.

What I think now needs to be done is for the supplier, grower and collector (all legal and conservation orientated and even embodied in one individual) to require of their hobby organizations to fulfil their entrusted obligations. Primary among these is the furtherance of knowledge. Certainly taxonomic confusion is the very first obstruction to knowledge. I find it extraordinary that this critical subject reigns as the most divisive and misunderstood element among interested people. Haworthia Updates 2 and 3 strives to address this singular problem. Do I have regrets? The first is that here are so many people with whom I have come in contact during this long journey and whom I would like to acknowledge, and cannot. Secondly, is that there is still so much tantalizing country out there begging for exploration and knowing that I will never make it.

The Socotran tayf - *Aloe forbesii* Balf. f. in habitat

Miroslav Řičánek [1] & Pavel Hanáček [2]

[1] Výhon 11, 635 00 Brno, Czech Republic, e-mail: mricanek@volny.cz
[2] Department of Botany and Plant Physiology, Mendel University of Agriculture and Forestry Brno, Zemědělská 1, 613 00 Brno, Czech Republic

Tayf is a Soqotri (native language of the island of Socotra) name for aloes in general. Miller and Morris (2004), in their comprehensive ethnoflora cite only three species of *Aloe* for this island – *A. squarrosa, A. jawiyon* and *A. perryi.* During our stay on the island we had the opportunity to observe all of them. *A. squarrosa* grows "head down" on inaccessible, north oriented vertical cliffs in the western part of the island. Miller and Morris (2004) mention it only "from a few scattered sites on the western limestone plateau". We observed it altogether in three different places. One of them was on north-eastern slopes of Jabal Buzayri (9 km south of Qalansiyah), where it was not growing hanging down the cliffs, but rather conventionally "head up" in the protection of *Buxanthus pedicellatus* shrubs, reaching up to 40 cm in height. Certainly it would be interesting to compare these two forms to see whether they are conspecific or not. To the western part of the island is also limited the recently (Christie, Hannon & Oakman, 2004) described *A. jawiyon*, growing at the altitude of 500 – 800 m, characteristic with its yellowish -green leaves and unbranched inflorescence, with the lowest orange flowers held immediately above the leaves. *Aloe perryi* seems to be the most widespread aloe on the island. It occurs on the whole island at altitudes ranging from sea level up to 900 m and is the most robust species there. Conversely, the most gracile among Socotran aloes is *A. forbesii* that inhabits high altitudes. Miller and Morris (2004) mention it under *A. perryi*. We suggest that *A. forbesii* deserves species status; however both taxa need further study to reveal interspecific relationships and connections, perhaps also to other, still undescribed aloe(s) of the island.

The particular *Aloe forbesii* site we would like to introduce in greater detail lies in the uppermost parts of the granite range called Haggeher, not far from Adho Dhemalu (Aduna) Pass. The range dominates the eastern and central part of the island; several of its peaks reach over 1500 m. A relatively moist climate and frequent fog support a rich vegetation. The Haggeher range harbours a number of endemites, from which about 80 are higher plants.

From the "capital" of the island, Hadiboh, Adho Dhemalu Pass is about 10 km distant, in an easterly direction. One must first cross an extensive dry plain laying only a few meters above the sea level and then climb the northern slopes, densely covered by shrubby vegetation. There used to be an unpaved road, but frequent landslides have destroyed it. Today the road is certainly undrivable, but still well defined and for a pedestrian quite sufficient.

Even though it is only nine o'clock the sun is already burning. The soil is soaked after the night rain and the air humidity is high as well. All the way along the rising road we observe an unusual diversity of woody plants, for example *Boswellia ameero, Ruellia insignis, Cocculus balfourii,…* just to name a few. We cross a creek where bright orange freshwater crabs *(Potamon socotrensis)* live and then pass big *Ficus vasta* trees on the ripening fruits of which are feasting splendid yellow-green pigeons (*Treron waalia*). We also admire stately *Dracaena cinnabari* specimens and just flowering extremely rare socotran endemite *Punica protopunica* – an evergreen shrub with stiff, leathery leaves. In the upper third of the ascent we enjoy somewhat cooler air and the fog even envelopes us from time to time. Here we find *Aloe sp.* which are in full bloom right now, in the second half of October. They resemble *A. perryi* a bit, but their leaves are horizontally spreading, more attenuate, and the plants are not suckering to form colonies. Their inflorescences are up to 40 cm long, unbranched, the flowers are clustered in compact racemes, not longer than 10 cm (see Fig. 1 & 2). It is interesting that individual plants finish their flowering quite soon. Five days later we revisited the place to see most of them faded. With higher altitude the bush vegetation gets more sparse and also its height is substantially lower. When we reach the saddle of Adho Dhemalu (970 m), a beautiful view reveals mountainous country towards the south where it gently slopes to the Nooged plain on the Indian ocean coast. Perhaps the highest diversity of succulent flora is right here, in the surrounding few hundred meters south of the pass. We encounter a large number of species which are not present at such altitude elsewhere. On granite slabs we find several interesting succulent plants, e.g. the endemic asclepiad *Duvaliandra dioscoridis*, also *Sarcostemma socotranum, Kalanchoe farinacea*, and three species of the genus *Ceropegia* are present. From higher situated rock-walls beautiful pink flowering *Begonia socotrana*, endemic *Exacum affine* and cushion forming species of *Helichrysum* and *Hypericum* find their way almost to the very pass.

Aloe forbesii occurs here solely on steep rocks, oriented towards the east and south-east, circa 200 m south of the saddle, in the altitude 850 – 900 m. It grows in rock crevices and pockets filled with humus, often with *Peperomia blanda, Plectranthus socotranus* and *Kalanchoe farinacea*. Older plants often make nice compact clumps consisting of many off-shoots. The largest clumps we observed were 20 cm in diameter and consisted of about 40 individuals. As previously mentioned, *A. forbesii* is surely the smallest representative of the genus on the island. Its leaves are only 4-7 (-10)cm long and (10-) 13-15 mm wide at the base. They clasp the stem at the base, are slightly bent upwards, attenuate. They are half-round at cross-section, both its parallel and toothed margins are also lightly bent upwards, teeth are 2-4 mm spaced and towards the tip almost disappear. Only rarely there is a toothless keel on the lower side towards the tip. The leaves are a vivid dark green to reddish in colour, usually there are 6 - 7 leaves forming a rosette on a single shoot. We were fortunate to observe this rare

aloe in flower also. Inflorescences are single, unbranched, up to 2 mm wide at base, max. 17 cm long, bearing 4 - 15 flowers. Pedicels are 7 mm long, perianth 13 mm long, dull red turning to green at mouth.

These plants differ widely from any form of *A. perryi* that we observed on the entire island. They are also very different from *A. jawiyon*. As a matter of fact, the latter appears to be very much closer to some forms of *A. perryi* than is the diminutive *A. forbesii* with its relatively long, erect stems and clumping habit, characters that are conspicuously absent in *A. perryi*

Fig. 1 & 2. *Aloe* sp. aff. *perryi*, N slopes of Haggeher Mts. - on the way to Adho Dhemalu & raceme.
Fig. 3 & 4. *A. forbesii* – detail of the raceme .

Fig. 5. A view towards the south from the saddle of Adho Dhemalu, the locality of *Aloe forbesii.*
Fig. 6. *Aloe forbesii* inhabits sheer east-facing cliffs.

Figs. 7 & 8 Compact clumps of *A. forbesii*

Fig. 9. Young plant of *A. forbesii*

and are retained in cultivation, a fact proved by plants collected on Adho Dhemalu Pass during the 1967 expedition, which are still in cultivation to this day.

References:

Christie S.J., Hannon D.P. & Oakman ex Miller A.G., Morris M. 2004. Ethnoflora of the Soqotra archipelago 723 (297, 234; fig.)

Miller A.G., Morris M. 2004. Ethnoflora of the Soqotra archipelago. Royal Botanic Garden Edinburgh.

Photographs, pages 15-17, by the authors.

Haworthia 'Pale Peace'- its history revealed.

Following the publication of Jos Verhoven's photograph of *Haworthia* 'Pale Peace' and comments in the November 2005 issue of Alsterworthia International, the history of this cultivar has become available. Rudolf Schulz, the proprietor of Tarrington Exotics Nursery, Australia informed the editor that *Haworthia* 'Pale Peace' arose as a mutation in his nursery in 1991 from *Haworthia* 'Big One' and has since been propagated vegetatively. *Haworthia* 'Big One' is a David Cumming hybrid produced from *Haworthia* 'Bronze Giant' and an unnamed hybrid *Haworthia* pollen donor.

Fig. 1. Succulent Tissue Culture Laboratory.

The induction of variegation into *Haworthia* by means of different tissue culture techniques.

Dr. Robert Wellens
Succulent Tissue Culture, Sint Felixstraat 13, 4411 DB Rilland, The Netherlands.

During the last 5 to 10 years STC has developed a very good in vitro multiplication system for almost all haworthias that exist. We have developed special techniques to multiply even the rarest and hardest haworthias, including *H. sordida*, *H. wittebergensis*, *H. koelmaniorum*, several Japanese elite cultivars and many, many more. It is now possible to multiply almost every single *Haworthia* clone starting with a single, young inflorescence. The procedure followed is the induction of embryogenic callus on parts of the flower stalk, followed by inducing differentiation into shoots. Using this method it is possible to produce over 1000 plants from one single flower stalk in 8-10 months time. Higher rates of multiplication are easy to accomplish, but, as the demand for such high numbers is limited, there seems to be no sense in doing this, although theoretically and practically it is very easy to do.

Beside this successful multiplication, STC started 4 years ago with a thorough study of the origin of variegated plants, specifically focussed on variegated monocotyledon plants, mainly *Haworthia*, *Aloe*, *Agave* and *Yucca.* Based on current knowledge of variegation, for which there is only little literature available, STC started to initiate experiments under supervision of Dr. Robert Wellens to try to induce variegation in monocotyledon plants. This study was first focussed on haworthias. Because of the large fund of knowledge available at STC for tissue culture techniques for *Haworthia*, the focus was put on in-vitro tissue cultures experiments. During 2003 and 2004 an enormous amount of work and time was put into these experiments, completely funded by STC with no financial support from any other parties.

The first results showed up in 2004 when it was shown possible to mutate in vitro grown callus tissue material into partly green-white structures and finally plants. The first real variegated plants were formed in 2004. As a result of these first result, STC increased its effort and time on these experiments in 2004 and 2005 resulting finally in an almost standard procedure for the induction of variegation in haworthias by means of tissue culture. Currently it is possible to induce mutations on almost any clone of callus tissue of *Haworthia* and finally turn the mutated callus into variegated shoots. This technique was then transferred to tissue cultures of *Yucca*, *Aloe* and *Agave* and all gave similar successful results in obtaining variegated plants.

Some results are shown here from the latest experiments, being the induction of variegation in *Haworthia maughanii* (a Kobayashi clone) and *Haworthia truncata*, also a Kobayashi clone. These two clones themselves were already magnificent plants, but the original material kindly donated by Diederik van den Abbeele from Belgium (inflorescences) was NOT variegated; the two original plants remain in Vanden Abbeele's collection as totally green plants. From the pictures, page 20, you can see a wide range of variegated plants, all originating from mutated callus tissue.

The variegated patterns, which can be seen in many plants, all differ; each plant is not the same. It is not possible to clone individual variegated plants by in-vitro tissue culture into similar variegated clones, although there are exceptions, for instance in *Gasteria*, *Hosta* etc. Furthermore, once you have a variegated *Haworthia* plant it is hard to get it multiplied by means of offsets, as the majority of the offsets will be completely green or completely white. Only 5% will be variegated.

It is also not possible to produce variegated plants by tissue culture from flower stalks from variegated plants; these flower stalks will only make callus for white or callus for green shoots; never a combination. It is always necessary to re-start by inducing mutation on green callus and then have it slowly regenerate into variegated plants.

Each individual variegated plant is genetically different even when they all originate from the same clone. A mutation for variegation may be partly in the genome, from which you also get so-called monstrose haworthias (see fig. 5, page 20), or in plastids, which carry small, mostly circular, DNA fragments inside the cytoplasm.

Seed propagation of variegated plants is possible when the variegation is controlled by mutations of the genomic DNA and also when seed is harvested from a variegated mother line, where the variegation is passed over through the cytoplasm (mother line only), not in the genomic DNA.

The cases mentioned above in which vegetative cloning of variegated plants is possible (like some gasterias, hostas, agaves and such) is purely based on the fact that the mutation lies on the genomic part of the plant's DNA, which is then translated into functional mutations in plastids, like chloroplast, which do give the plant its green colour. It is then possible to let the plant develop in a natural way to produce offsets with the same characteristics. However, cloning a piece of green tissue from such plants give again 100% green plants. Cloning of variegated haworthias is almost not possible, but not 100% impossible, and this applies to both in vitro and in vivo cloning. Leaf propagation in variegated haworthias might give a new variegated shoot when it emerges from the exact edge of leaf pattern variegation, so that both green and white come together. The whole story behind variegation in plants

is not fully known. A thorough study of the process is required.

During the last year STC has received numerous requests for the total protocol of their methods for creating variegated plants in vitro. However, as the funding was made solely by STC itself, STC cannot share the protocol at this moment with other TC labs. We hope people will understand. The potential for inducing variegation in monocotyledon plants in general is huge and some markets have still to be explored.

The plants that STC produced and will produce will all be for sale on STC's website under the VARIEGATION button. STC expects to increase the number of plants on offer in 2006 and on. The website of STC can be found at:

www.succulent-tissue-culture.com

Photographs pages 18 and 20
by the author.

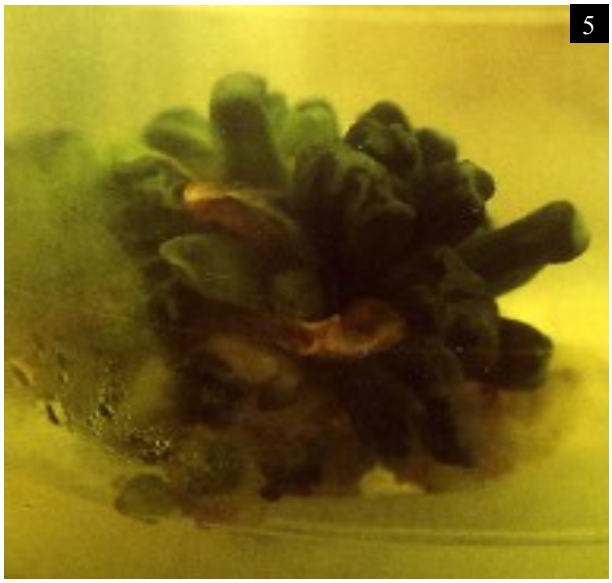


Fig. 1. *Haworthia maughanii* variegated - from green plants ex Kobayashi.

Fig. 2. *Haworthia truncata* variegated - from green plant ex Kobayashi.

Fig. 4. Hybrid variegated plants from a *Haworthia* hybrid ex D. v.d. Abbeele.

Fig. 5. *Haworthia maughanii* monstrose. A mutation of a normal plant ex Kobayashi.

Ten Japanese Haworthia Cultivars.

Dr. M. Hayashi & Harry Mays.

Local names were used in Japan during the development of these ten *Haworthia* cultivars. The opportunity is now being taken to name them in accordance with the International Code of Nomenclature for Cultivated Plants, Edition 7, 2004. Photographs: Dr. Hayashi.


1

***Haworthia splendens* 'Silver King'**

Splendens was originally classified by J.D. Ventner & S.A. Hammer as a variety of *H. magnifica*. Dr Hayashi reclassified it as a species in its own right. Whichever classification you accept, this cultivar is a selected clone developed from *splendens* by Mr. Nishiaki, Japan. During the development process it was known as Nishiaki No. 1.

The overall form of the cultivar is similar to that of the normal form. Distinguishing differences of the cultivar are that the leaf ends are distinctly rounded and the retuse leaf ends are predominantly silvery-white because of the increase in size and number of tubercles. The brown lines are obscured in some areas by the tubercles, but in others they appear more prominent because of their size and the contrasting white.

Propagation: offsets and leaf cuttings.

***Haworthia* 'Garasu'**

This cultivar is a selected clone of a hybrid between *Haworthia comptoniana* G.G. Smith (*H. emelyae* v. *comptoniana* J.D. Ventner & S.A. Hammer) and an unrecorded species. During development work it was known in Japan as *Haworthia comptoniana* Glass Compto.

In form it very closely resembles *H. componina,* which suggests that successive hybrid progeny have been bred back to pure *comptoniana* on a number of occasions.

The cultivar has a distinctly glassy appearance and more extensive pale-yellow reticulation than the species. The light green and yellowish lines and glassy appearance are the prime features of the cultivar. Garasu means glass.

Propagation: offsets and leaf cuttings.


2


3

Haworthia 'Marilyn'

This cultivar is a complex hybrid. It was grown from seed produced by *Haworthia* 'Garasu', the pollen donor being unrecorded. 'Garasu' itself is a hybrid with an unrecorded pollen donor.

The retuse leaf ends are covered with large white tubercles coalescing into closely-packed, longitudinal rows, which overflowing to some extent into the non-retuse upper and lower leaf surfaces. These are otherwise only marked with random pale, greenish-white spots and occasional irregular white blotches.

Because of its fascinating beauty it was named Marilyn after Marilyn Monroe, front cover & fig. 3. The editor was inundated following an appeal for a photo of Marilyn. *The response was far greater than when he requests photos and articles*!!

Propagation: offsets and leaf cuttings.


4

***Haworthia pygmaea* 'Tsuyu-Simo'**

This clone was developed along the same lines as *Haworthia pygmaea* 'Seiji', again by Mr. Ohokuwa, but this time the selection was made for even increased whiteness brought about by white hairy papillae. In this cultivar the circa two to five lines are dark coloured which comprise the surface tissue between tubercles. During development work this clone was again simply known in Japan as *Haworthia pygmaea.* Tsuyu-Simo means Dew Frost

Propagation: occasional offsets and leaf cuttings.


6

***Haworthia* 'Yayoi-Nishiki'**

This cultivar is a hybrid between a *picta* form of *Haworthia emelyae* and an unknown pollen donor (possibly *H. pygmaea*). It was created by Mr. Ohkubo, Japan. In Japan during development work it was known as *Haworthia picta* aff *H. dekenahii* variegated.

The basic colour of the smooth leaves is greyish lavender, which is heavily laced with white flecks coalescing into stripes of varying thickness on the upper leaf surfaces, with a suggestion of diffused pink. The lower surfaces have scattered faint spots. In addition there are pinkish-yellow stripes of varying thickness on some of the leaves on both surfaces. Yayoi is the name of an ancient age in Japan and Nishiki means variegated.

Propagation: offsets and leaf cuttings.

***Haworthia pygmaea* 'Seiji'**

This cultivar is a clone of *Haworthia pygmaea* Poelln. developed by selection for increased number and size of the whitish papillae, which give the cultivar an impressive appearance on a grey background, with two to three enhanced white lines comprising papillae. The clone was developed Mr Ohokuwa, Japan, a noted breeder of *pygmaea* cultivars. During development work this clone was simply known in Japan as *Haworthia pygmaea.* Seiji means Celadon Porcelain.

Propagation: occasional offset and leaf cuttings.


5

***Haworthia emelyae* 'Royal White'**

A plant with smoothish leaves and white flecking, at present classified as a clone of *emelyae* (but it may be a species in its own right - not *H. picta,* further research required - Dr Hayashi), was used as the starting point of 'Royal White'. Selection has resulted in this cultivar with an impressive amount of white-speckled-green and green lines in the retuse leaf ends. The sides of the leaves have fewer white spots and the green is replaced by reddish brown towards the base, with reddish brown lines projecting into the retuse leaf ends on some leaves. The cultivar was developed for its markings and colour. During development it was known in Japan as *Haworthia picta* 'Royal'.

Propagation: occasional offsets and leaf cuttings.


7

***Haworthia dekenahii* 'Sanekata's Variegated'**

The origin of this cultivar is a habitat plant collected by Mr. Rossouw from the type locality, Draai Hoek, SA. Mr Sanekata, Japan, established its variegation and named the cultivar. During development work the cultivar was known simply as a variegated *H. dekenahii.*

'Sanekata's Variegated' is a very large and broad form of the species with pink and blackish green variegation on some of the leaves.

Propagation: offsets and leaf cuttings.

Note. If you follow Bayer's classification the cultivar name is *Haworthia magnifica* v. *dekenahii* (G.G. Sm.) M.B. Bayer 'Sanekata's Variegated'. Dr Hayashi considers *dekenahii* a distinct species.


8


9

***Haworthia picta* (Moegi Group) 'Mr. K. Ohkuwa's Silver Green'**

The Moegi Group comprises greenish plants from seed from large clones of *H. picta* v. *janvlokii,* which have dense small flecks and roundish, large leaves.

The leaves of this cultivar are medium green with just a touch of reddish-brown on the non-retuse upper leaf surface on some leaves. The retuse leaf ends have dense, silver flecks coalescing into broad longitudinal stripes, separated by green lines of variable width. Silver dots extend into the non-retuse surfaces. Mr. Ohkuwa's development of this green and dense silver leaved plant provide the name for this cultivar.

Propagation. Offsets and leaf cuttings.

***Haworthia bayeri* 'Zaramado Variegated'**
Fig. 10 back page.

This cultivar has the form of the species, but the retuse leaf ends are modified with more prominent lines and variable reticulation, which may extend into the non-retuse upper surface. The retuse leaf ends are bluish-green compared with the usual brownish to blackish green of the species and some are variegated. The non-retuse parts have substantial, but variable, amounts of blackish-green and are more extensively variegated. The variegation, which is either concentrated in stripes or diffused over large areas, is predominantly pink, sometimes yellow. During development work this plant was known in Japan as *Haworthia correcta* L8 (Kobayashi).

Propagation. Offsets and leaf cuttings.

The following changes need to be made to comply with the ICNCP (Seventh Edition) 2004.

Moegi Group replaces Silver Green Picta Group [Alsterworthia International 5(3)23], an invalid name. The Moegi Group comprises large clones with greenish, large, roundish leaves with dense, small flecks, which were grown from seed of *Haworthia picta* v. *janvlokii* I. Breuer. The original clones were developed by Mr. Ohkuwa, Japan, who chose the name Moegi = verdure.

Haworthia picta 'Horikawa Picta' published in Haworthia Study 5 (10) is amended to *Haworthia picta* (Galaxy Group) 'Horikawa'. A species name cannot be a component of both a group name and a species name.

Marble Group is confirmed because marble is a feature of the Group. *Haworthia picta* 'Marble Star' is therefore invalid because marble cannot be used in both the group and cultivar names. The clone is not now being given a cultivar name. It will be known as clone no. 1 in Mr Ohkubo's breeding collection.

Sakai Silver Group, Alsterworthia International 5(3) is confirmed. Haworthia picta 'Silver' is amended to *Haworthia picta* v. *janvlokii* 'Mirror'.