

ALSTERWORTHIA INTERNATIONAL THE SUCCULENT ASPHODELACEAE JOURNAL



Fig. 1. *Haworthia pygmaea* variegated
A single plant produced from a quarter plant. 3 years old.

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CHORTOLIRION Berger

INFERRED RELATIONSHIPS FROM LIMITED HYBRIDIZATION

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Keywords: Relatedness, *Chortolirion*, *Gasteria*, *Aloe*, *Haworthia*, intergeneric hybrids.

Abstract. Intergeneric hybrids within *Aloaceae* have been achieved with genera other than *Chortolirion*, (Cumming 1999a), those with *Chortolirion* have been few, with doubt being expressed as to their existence. The following experiments were carried out to explore relationships between *Chortolirion* and the other genera.

Introduction: *Chortolirion* A. Berger is, following a recent revision (Smith 1991a; 1991b; 1995), a monotypic genus, *C. bergerianum* Dinter, *C. stenophyllum* (Baker) A. Berger, *C. subspicatum* (Baker) A. Berger and *C. tenuifolium* (Engler) A. Berger all being subsumed under *C. angolense* (Baker) A. Berger. Though *Chortolirion* has floral affinities with *Haworthia*, it is morphologically distinct in having acuminate capsules, bulbous rootstock, deciduous leaves, and different pollen germination requirements (Smith 1991b). It is found throughout much of the summer rainfall areas in southern Africa including, Angola, Namibia, Botswana as well as Gauteng, Mpumalanga, North West, Limpopo, Free State, Northern Cape and Eastern Cape provinces of South Africa.

A *Chortolirion* species that occurs in the Middelburg, Bronkhorstspuit area of Mpumalanga exhibits a number of distinctive characters: late Summer flowering, not Spring, and an inflorescence of 1,000 mm or greater, not 360mm as for *C. angolense*. As this plant flowers readily in cultivation it was the species used in the following breeding experiments.

Records show x *Gastrolirion orpetii*, E Walther, 1933, was erected for a hybrid between *Gasteria* sp. and *C. tenuifolium*. Smith (2001) rightly states that this is an invalid name and registers some doubt on the existence of such a plant. Furthermore, for x *Alolirion*, G.D. Rowley, 1973, erected for the hybrid *Aloe striatula* Haworth x *Chortolirion*, Forster (2001) expresses doubt on the existence and/or the parentage of this plant. The author would also express some doubt in this direction in that, the *Aloe* was the pod parent, which has a longer style than the pollen donor. One of the barriers to hybridization in *Aloaceae* is the apparent inability of pollen tubes to grow the full length of styles which are longer than that of the pollen donor (Cumming 1999b).

Chortolirion is the only genus on which the author has not previously carried out hybridizing experiments in order to ascertain inferred relatedness to other genera within *Aloaceae*. This has been due to the lack of flowering material. It was expected that hybrids between *Chortolirion* and *Gasteria* would be easily achieved as *Gasteria* has proved to be a universal donor. The cross *Chortolirion* x *Aloe* would be unlikely. However, if it were possible, it was thought that it would be most likely achieved using grass

Aloes, which share some morphological characteristics and distribution. *Aloe striatula* was not available. It was doubted that any other successful crosses would result from the trials.

Method & Materials; three pairs of fine forceps, a x 2 magnification 'Optivisor', coloured thread.

Plants used, *Gasteria bicolor* v. *bicolor* Haworth (pollen only) Grahamstown form; *G. bicolor* v. *liliputana* (V. Poelln.) E.J.v. Jaarsveld; *Aloe minima* Baker; *A. minima* v. *blyderivierensis* (Groenewold) Reynolds; *A. bowiea* Schultes & Schultes; *A. perrieri* Reynolds; *A. 'Jason'* *; *A. 'Zygo'* *; *A. parvula*; A. Berger x *A. albiflora** Guillaumin; an unnamed x. *Poellnaria** Rowley; *Haworthia tessellata* Haworth; *H. koelmaniorum* Obermeyer & D.S. Hardy; *H. scabra* Haworth; *H. truncata* Schonland; *H. truncata* v. *minima* Breuer; *H. magnifica* v. *splendens* Hammer & Venter; *Chortolirion* sp.

* are all hybrids/cultivars from previous investigations.

The top three tepals were removed, using the forceps, from those flowers that required their removal to gain access to the stigma, such as in *Haworthia* and *Chortolirion*. Visual contact should be made with the stigma to confirm that every effort has been made to effect pollination. Forceps were repeatedly thrust into the potting mix to remove any traces of pollen between pollinations. It was found that *Chortolirion* tepals were best removed a day prior to pollination, as a build up of nectar prior to the ripening of the pollen interferes with the transfer of pollen. Where possible, ten pollinations were attempted with any one cross. The time of day seems relatively unimportant, as pollen can remain viable for one to two days and longer, depending on prevailing weather conditions. Most pollinations were conducted in the late afternoon in late Summer. With *Aloe bowiea*, pollinations were made as soon as the style was exerted beyond the anthers.

Plants were removed from an open plant house to a pollinator free, dry, warm, well-lit environment as soon as peduncle development was noted. Otherwise the peduncle was often infected with a fungus that causes it to wilt. It should be noted that conditions, environmental and climatic, do affect the success of intergeneric pollinations. It has been found that many crosses that were easy to achieve in Brisbane, Australia are more difficult to achieve under east coastal South African conditions. Coloured threads were used to separate/mark pollinations of different parentages on the same pod parent.

In conjunction with the above experiment, a number of plants, viz. *Aloe minima*, *A. bowiea* and the *Chortolirion* sp., were observed for seed set in an open pollination situation. The seed sets were recorded.

Results are shown in tables 1 to 4.

Table 1

Example, 6/10 indicates six successful pollinations out of ten attempts, X indicates not attempted.

Pollen parent.	Pod parent.			
	Chortolirion	Gasteria bicolor v. bicolor	Gasteria bicolor v. liliputana	X Poellnaria
Gasteria bicolor v. bicolor	6/10	X	X	X
Gasteria bicolor v. liliputana	5/10	X	X	X
X. Poellnaria	0/2	X	X	X
Chortolirion	6/10	X	0/4	0/4

Table 1. As expected *Chortolirion* was compatible with *Gasteria*, *Gasteria* acts as a universal donor (Cumming 1999a). Seed was set on the *Chortolirion* rather than the *Gasteria*, demonstrating the ‘longer style’ syndrome. It was thought that the X *Poellnaria* pollen may have been compatible. However, it was noted that the pollen appeared to produce a very small amount of what might be thought of as ‘fertile’ pollen.

Table 2

Table 2. The above results were as expected with no compatibility shown between *Chortolirion* and *Aloe*. There was one

Pollen parent.	Pod parent.									
		1	2	3	4	5	6	7	8	9
<i>Chortolirion</i>	1	6/10	0/10	0/10	0/10	1/10	0/10	0/10	0/10	0/10
<i>Aloe minima</i>	2	0/10	7/10	X	X	X	X	X	X	X
<i>A. minima</i> v. <i>blyderivierensis</i>	3	0/10	X	X	X	X	X	X	X	X
<i>A. minima/parviflora</i>	4	0/10	X	X	X	X	X	X	X	X
<i>A. bowiea</i>	5	0/10	X	X	X	3/4	X	X	X	4/4
<i>A. perrieri</i>	6	0/10	5/5	X	X	X	X	X	X	X
A. ‘Jason’	7	0/10	3/3	X	X	5/5	X	X	X	2/3
A. ‘Zygo’	8	0/10	X	X	X	X	X	X	X	X
<i>A. parvula</i> x. <i>albiflora</i>	9	0/10	X	X	X	X	X	X	X	X

attempt that set seed on *Aloe bowiea*, further growing of seedlings is needed to determine if this is a true hybrid. Though self-incompatibility is the order of the day within *Aloaceae*, it is possible for foreign pollen to provide the necessary requirements to overcome self-incompatibility mechanisms without the exchange of genetic material, resulting in self-fertilization.

These results are at variance with those of Treutlein & al.(2003) where it is demonstrated that there is a relatedness between *Chortolirion angolense*, *Aloe boylei* Baker and *A. verecunda* Pole-Evans in their DNA sequencing. (Editor’s note. *Alsterworthia* International Special Issue No. 4. contains the Treutlein paper “Molecular Phylogenetics”.)

Table 3

Table 3. These were almost unexpected results, however relatedness is demonstrated in Nectar Sugar analysis (G.F. Smith et al. 2001). Here seeds were set on plants from the subgenus *Hexangulares* and not subgenus *Haworthia*, no seeds were set on the *Chortolirion*, *Chortolirion* style being longer than those of *Haworthia*. (Editor's note. For Smith et al's paper "Infrageneric classification of *Haworthia* (Aloaceae): perspectives from nectar sugar analysis" see *Alsterworthia International* 3(3)9-12, November 2003.)

Table 4

		1	2	3	4	5	6	7
<i>Chortolirion</i>	1	6/10	8/10	8/10	3/5	0/10	0/10	0/10
<i>Haworthia tessellata</i>	2	0/10	X	X	X	X	X	X
<i>Haworthia koelmaniorum</i>	3	0/10	X	4/5	X	X	X	X
<i>Haworthia scabra</i>	4	0/10	X	X	X	X	X	X
<i>Haworthia truncata</i>	5	0/10	X	X	X	X	X	3/4
<i>Haworthia truncata v minima</i>	6	0/10	X	X	X	X	X	X
<i>Haworthia magnifica v splendens</i>	7	0/10	X	X	X	4/4	X	X

Table 4. This records no seed set by bees or other vectors in an open pollination environment on *Chortolirion* and acts as a limited control.

Open Pollination. Pod Parent only.		
<i>Chortolirion</i>	<i>Aloe minima</i>	<i>Aloe bowiea</i>
0/10+	12/23	8/16

Conclusions

It appears that *Chortolirion* exhibits a close relatedness to *Haworthia* subgenus *Hexangulares* rather than to the grass aloes as suggested in Phylogeny in *Asphodelaceae*, Treutlein & al. 2003. However, unless all the genera within *Aloaceae* are subsumed into *Aloe* there appears little to be gained by changing the status of *Chortolirion*, such as to include it in *Haworthia*, (Obermeyer 198; Hayashii 2004) in which it would sit uncomfortably and require a new circumscription of the genus *Haworthia*.

References:

CUMMING D.M
 (1999a) New nothogenera proposed for trigenic hybrids within *Aloaceae*. *Haworthiad* 13(1): 20-21
 (1999b) Thirty years of twitching forceps on *Aloaceae*. *Haworthiad* 13(4)141-147
 FORSTER P.I
 (2001) Book Review: *Plant Systematics & Evolution* 229: 131-133.
 HAYASHI M.
 (2004. In submission.) Comparison of floral structures among the major groups

of *Aloaceae*. Taxon :??

OBERMEYER A.A.
 (1973) *Aloe, Chamaealoe, Haworthia, Astroloba, Poellnitzia* and *Chortolirion*. (In: *Notes on African Plants: Liliaceae.*) *Bothalia* 11: 116
 SMITH G.F.
 (1991a) Historical review of taxonomy of *Chortolirion* Berger (*Asphodelaceae: Alooideae*) *Aloe* 28: 90-95
 (1991b) Studies on the reproductive biology and palynology of *Chortolirion* Berger (*Asphodelaceae: Alooideae*) in southern Africa, *Taxon* 40: 61-73
 (1995) *FSA contributions 3: Asphodelaceae/Aloaceae*, 1029010
 (1996) *Chortolirion*. *Bothalia* 25(1): 31-33
 (2001) *Illustrated Handbook of Succulent Plants, Monocotyledons*: 189-190
 SMITH G.F. & al.
 (2001) Infrageneric classification of *Haworthia* (*Aloaceae*): perspectives from nectar sugar analysis: *Syst.Geogr. Pl.* 71: 391-397
 TREUTLEIN & al. (2003) Phylogeny in *Asphodelaceae*: *Taxon* 52: 193-207

Aloes of Madagascar. Part 2.

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In August 2003, I participated in an expedition to the centre and south of the island of Madagascar. The objectives were threefold: to observe localised species, to try to find species no longer encountered “in situ” for several decades and, finally, to find new species.

In spite of the damage done to the environment by man, numerous species were observed during the 24 days of this expedition (please also see Part 1 in *Alsterworthia International* Vol. 5. Issue 1, 2005). One can speak of a true expedition, when the difficulties encountered were numerous. The absence of road maintenance was the main cause.

For this second part, we are going to retrace the main route, but concentrate on the many detours, which were not mentioned in the first part. The first day, before commencing our descent towards the

Fig. 2. *Aloe madecassa* Arivonimama
Fig. 3. *Aloe macroclada*. E. Soanindrariny.
Fig. 4. *Aloe macroclada* flowers. Soatanaana



south, we visited a site near to, and to the east of, Arivonimano. On the summit of imposing granite domes, grows a form of *Aloe madecassa* H. Perrier (Fig. 2, page 5). These superb plants, exposed to the full sun, glowing red, are without doubt very near to the species *Aloe deltoideodonta*. Another *Aloe* was present at this site, *Aloe macroclada* H. Perrier (Fig. 3, Page 5). This tall, stemless species is without doubt the most widely distributed on the island, covering two thirds of the country. A week later, we had the opportunity to see at Soatanaana, to the east of Fianarantsoa, an individual in flower (Fig.4, page 5). This species was also seen throughout the extensive burnt prairie. Despite damage to leaf extremities, the plants seem to resist burning.

To the west of Fianarantsoa some surprises awaited us. To begin with, the delightful *Aloe haworthioides* Baker (Fig. 5). It is a small, remarkable plant, difficult to locate in the midst of lichen and clumps of *Euphorbia fianarantsoae* (Fig. 6). Roundabout grow large bushes of *Aloe acutissima* var. *acutissima* H. Perrier (Fig. 7) with stems more or less erect. Returning to Fianarantsoa, to the east of Isorana, we came across an *Aloe* sp. (Fig. 8) growing on the vertical cliff. By using binoculars we could see certain individuals hanging down with very thick stems, about 1.50 metres long. It is possible that we were in the presence of a new species.

Continuing our descent to the south, we halted on domes of gneiss, to the south of Ambalavao, to look for *Aloe ibitiensis* H. Perrier (Fig. 9), which we failed to find on Mont Ibity. The information we had been given before our departure by John Lavranos was precise. The plants were there, in full sun, in brilliant orange, allowing us to locate them from afar. It is without doubt one of the most beautiful small species we encountered during our journey. After having passed the twin Inselberg de Zazafotsy, which marked a change in the climatic region, and before arriving at Ihosy, we stopped at Ampataka, where interesting succulent plants grow, particularly imposing *Adenia olaboensis*. On this occasion we were able to see *Aloe intermedia* (H. Perrier) Reynolds (Fig. 10). Some kilometres further south, we came across a large number of *Aloe deltoideodonta* var. *candicans* H. Perrier (Fig. 55



Fig. 5



Fig. 6



Fig. 7

Fig. 5. *Aloe haworthioides*. Andoharanomaitso.
 Fig. 6. *Aloe haworthioides* & *Euphorbia fianarantsoae*. Andoharanomaitso.
 Fig. 7. *Aloe acutissima* v. *acutissima*. Andoharanomaitso.



Fig. 8



Fig. 9



Fig. 10.

back cover), with delightful, reddish rosettes, on sparsely vegetated rock.

The next day, an excursion was scheduled to the Pic d'Ivohibé, where the vegetation, at about 1800m, is not well known. On departure from d'Ihoso, we saw the first *Aloe divaricata* Berger (Fig. 12, page 8), with majestic bearing and a superb inflorescence in the form of a scarlet red, pyramidal panicle. We would find quantities of them in all the southern parts of the island. Six hours were necessary to travel the 110 km, which separated Ihoso from Pic d'Ivohibé. Three more hours were necessary to climb to the summit. During the ascent we came across an *Aloe capitata* Baker (Fig. 13, page 8). It was perhaps a form of *Aloe capitata* var. *quartziticola* H. Perrier (Fig. 11, page 8) a species well distributed between Ansirabe and Ihoso. The glaucous, grey-green leaves and yellow, capitate inflorescence are characteristic of this fine species. Almost at the summit grew an *Aloe* sp. having affinities with *Aloe macroclada* Baker.

After this long detour, our route continued towards Fort Dauphin (Taolanaro). Before arriving at Fort Dauphin, we branched off towards the north in the direction of the xerophytic forest, the Behara region. Midst *Alluaudia procera* and *Euphorbia plagiantha* arose some magnificent *Aloe vaotsanda* R. Decary (Fig. 14, page 8). This species is very near to *Aloe vaombe* Decorse & Poisson (Fig. 15, page 9), but is distinguished from it by its recurved leaves and by its shorter inflorescence. In other respects, the racemes are bent, are shorter and the flowers are denser than those of *Aloe vaombe*. This latter flowers in general two month before *Aloe vaotsanda*, which allowed us to collect seed.

Keeping to the coast, south to Tsiombe, we stooped in a very dry forest dominated by *Alluaudia comosa* and *Operculicarya decaryi*. We were able to prospect different sites for *Aloe antandroy* (R. Decary) H. Perrier (Fig. 16) and take account of the great variability of this species. In the same region we came across a more robust form, which corresponded with the description of *Aloe decaryi* Guillaumin (Fig. 17), considered by Reynolds as "Species non satis cognita".

The next day, whilst going up towards Antanimora, we stooped at the site of *Aloe acutissima* var. *antanimorensis* Reynolds

Fig. 8. *Aloe* species. 10km E. Isorana.

Fig. 9. *Aloe ibitiensis*. Anara. S. Ambalavao.

Fig. 10. *Aloe intermedia*. Ampataka.



Fig. 11



Fig. 12

(Fig. 21, page 10), which was discovered by Reynolds. This plant grows as a bush on flat, rocky surfaces and differs from the typical form, principally by the shorter stems and leaves.

Fig. 11. *Aloe capitata* var. *quartziticola*. E. Iohosy.
 Fig. 12. *Aloe divaricata*. West Tsiombe.
 Fig. 13. *Aloe capitata* forma nova.. Pic d'Ivohibe
 Fig. 14. *Aloe vaotsanda*. N. Behara.



Fig. 13



Fig. 14



Fig. 15

The last days were devoted to exploring the region of Fort Dauphin (Taolanaro). We had the opportunity to find in the region of Amboasary, the very rare and majestic *Aloe suzannae* R. Decary (Fig. 19, page 10) in the middle of a dense forest of *Alluaudia ascendens*. In point of fact, only two were found. One was about 7 metres tall (Fig. 20, page 10). It is the tallest of the Madagascan aloes. According to Reynolds, the flowers open only in the night. It is a species threatened with extinction.

When approaching Fort Dauphin, to the south of Manambaro, we found *Aloe helenae* P. Danguay (Fig. 18) in flower. It is an arborescent species, up to 4 metres high with superb scapes bearing greenish-red to yellow, campanulate flowers. All around grow a large number of *Euphorbia francoisii*. Unfortunately the site is invaded by *Eucalyptus* sp., which suffocates the local vegetation.



Fig. 16

The last day was the occasion to visit the site of *Aloe bakeri* Scott Elliot (Fig. 22). We located some clumps of this small, fine plant beside of the sea, on a rocky hill to the west of Fort Dauphin.

To prospect a large island such as Madagascar is a difficult enterprise, which demands important equipment and faultless organisation. It is also necessary to have a great deal of time available and to have good physical form, because often the

Fig. 15. *Aloe vaombe* & *A. divaricata*. Tranovao East.
 Fig. 16 *Aloe antandroy*. West Ambazoa.
 Fig. 17. *Aloe decaryi*. West Ambazoa.
 Fig 18. *Aloe helenae*. South Manambaro.



Fig. 17



Fig. 18



Fig. 19.



Fig. 21

plants are found only at extreme heights, where burning and overgrazing do not take place.

Our expedition was very fruitful, not only because of the large number of aloe species seen, but also because of the great diversity of succulents encountered.



Fig. 20

Fig. 19. *Aloe suzannae*. Ranomainty. 18km Ambosary.
 Fig. 20. *Aloe suzannae*. Ranomainty. 18km Ambosary.
 Fig. 21. *A. acutissima* v. *antanimorensis*. 10km E. Andalatonosy.
 Fig. 22. *Aloe bakeri*. West Fort Dauphin.



Fig. 22

Holes, holes and more holes.

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Sometimes, what is not there can be of interest as well as that which is there. This is the case with holes. Holes in the veldt can mean the absence of a plant that could otherwise have been enjoyed by many passing humans, or perhaps have satisfied the sexual and reproductive needs of its neighbours and so contributed to the viability of a wild population that all could enjoy.

I happened upon my first hint of holes to come on my arrival in South Africa for the 2003 Succulent Convention. On the day of my appearance in Cape Town, the front page of the daily newspaper announced with great gusto, as is the wont of media everywhere, the arrest of a Japanese gentleman for digging holes in the South African veldt. There was of course also the issue of the displacement onto his person of the haworthias which were the previous residents of the aforesaid mentioned holes.

Sometime later, I met up with Bruce Bayer who was conscripted by Nature Conservation to ascertain the value of these holes, err... plants. Bruce certainly had a perspective on the matter of hole digging. He also displayed great concern about the welfare of the 564 plants, which were innocent victims in the whole affair, which were incarcerated by the gendarmes and facing a death penalty. Even if they were not to be destroyed, they would never see their friends or relatives, or even their home again. Later, I stayed with a local farmer in who's guesthouse the Japanese gentleman had resided prior to and after his arrest, who also had strong views on the creation of holes for pleasure or profit. The finding of holes seemed to haunt my trip throughout South Africa.

I had joined the pre-convention tour of the Richtersveld and immediately headed north, where holes (and *Haworthia*) are not so numerous. However, even here, in the more arid areas, there were rumours of substantial numbers of new holes. These particular holes have come about due to a recent diet fad. Apparently, drug companies learned the San people of South Africa have been using *Hoodia* to successfully stave off hunger pangs without unwanted side effects. Matched to this, was the release of a documentary about the dietary benefits of extract of *Hoodia*. Thus, *Hoodia* have become much in demand and alleged truckloads were supposedly heading south for processing.

The Richtersveld did provide us with *Haworthia venosa*, *H. arachnoidea* and of course *Gasteria pillansii*. Fortunately, the only holes to be found were the bite-sized pieces grazed from *Gasteria* leaf tips (Fig. 23) and in some cases grazed, succulent, growing- centres, (Fig. 24, page 11), which left a pile of leaves from which new plants could develop. However, at the site of *G. pillansii* v. *ernesti-ruschii*, the plants were nowhere to be found. This may have been a problem with holes, or hopefully well camouflaged plants.



Fig. 23.



Fig. 24.



Fig. 25.

Fig. 23. *G. pillansii* with bitten leaf end.
Fig. 24. *G. pillansii*. Centre eaten, leaving parts of leaves, which may root and form new plants.
Fig. 25. *Aloe longistyla*

Back in the Western Cape, as part of a 2003 Succulent field trip, run by the South African Succulent Society, delegates were taken to a number of succulent sites. These were close to Calitzdorp, the location of the convention. The first site visited was the location of *H. truncata* v. *maughanii*. This site was flat with red soil (Fig. 26). The obvious succulents were large masses of *Glottiphyllum regium*, some in flower. They dominated the succulent



Fig. 26.

landscape. There were also some nice *Aloe longistyla*, (Fig. 25, page 11), some clumps of *Astroloba* and a veritable array of small succulents. There were a number of holes in this area. At this time, the first thought was that hole diggers had recently been here and secreted away the *Haworthia* we were seeking. However, more realistically, these holes could probably be blamed on the activities of porcupines. Of note is that *H. truncata* vars. *truncata* & *maughanii* are plants that can make their own holes (Fig. 27). They do this with the aid of contractile roots, which draw the plant bodies into the soil. This was also observed in *H. mucronata* (Fig. 30), which grew in the same habitat alongside *H. truncata*, east of Oudtshoorn.



Fig. 27

After the conference, I met up with Bruce and Daphne Bayer. We stayed with a local farmer in his guesthouse near De Rust for a few days. There were holes aplenty in this area. The farmer showed us a population of around 80 holes in which a nice population of *H. scabra* allegedly recently resided. This was in a localised area by the side of the road. Fortunately, another population, well off the beaten track was spared, although only a few plants could be found (Fig. 28).

A bit later Bruce took us to the site of *H. comptoniana* to check on the current population. Bruce also wanted to see how the plants he had replanted a few years before were getting on. While we found several holes, some were obviously the result of porcupines digging for bulbs that were in this area. After an hour of so searching no *H. comptoniana* was found. This was a great disappointment. However,



Fig. 28.

Fig. 26. Holes resulting from the disappearance of *H. truncata* v. *maughanii*.
 Fig. 27. *H. truncata* v. *maughanii* creating its own hole.
 Fig. 28. *Haworthia scabra*.

I understand we simply may have missed them as later visitors to this site did locate some.

Haworthias were not the only ex residents of the holes in the De Rust area. *Dioscorea* holes nearly a meter across were also found on the slopes of the mountains (Fig. 29). Local information suggests that hole digging is a particular problem in this region, as it is close to the Eastern Cape region where rules are more lax and there is a major plant wholesaler present, allegedly bulk-trading in field collected plants. It purportedly is a common practice to drop someone off by the side of the road, pick them up later with their bag of plants and quickly move across the border into the Eastern Cape.

Other holes in the veldt involve the traditional *Aloe* industry. Holes are made for gathering of aloe sap or bitter aloe - the bitter yellow juice found just below the skin. The extraction process involves draining the leaf of its bitter sap in the fields where the leaves are harvested, by placing them in a circle with the severed leaf ends draining into a hole (Fig. 32). Often, two to three hundred leaves are stacked in a circle, cut surfaces facing inwards and overlapping, so that the sap drains and collects in the hollow (below middle). This is seen in many areas where aloes grow. While it is harvested as a 'renewable' resource, some of the aloes are harvested to within an inch of their lives (Fig. 31) and it is quite likely many would die if a poor rainfall season ensued.

It is important to point out that not all holes in the veldt are of the illegal variety. Some occur in the pursuit of scientific understanding of plants and are dug with the appropriate

permits. The work done by Bayer in *Haworthia* and van Jaarsveld in *Gasteria* spring to mind. The critical issue is that the holes are not created simply for the sake of scientific curiosity and subsequent publishing of findings in some obscure journal. Rather, the plants form living collections where material is eventually propagated and eventually distributed to collectors around the world.

Fig. 29. Hole created by the removal of a *Dioscorea* near De Rust.
 Fig. 30. *Haworthia mucronata* creating its own hole.
 Fig. 31. An *Aloe* with few leaves remaining.
 Fig. 32. Aloe leaves stacked for draining sap into the centre pit.



Fig. 29



Fig. 31



Fig. 30



Fig. 32

Miniature Aloes

Brian Kemble

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Fig. 33

Miniature Aloes have long held a particular fascination for me. An *Aloe ferox* in flower is certainly an awe-inspiring sight, but there is a special kind of charm in a compact, little plant that you can hold in your hand and admire at close range. Amongst the smaller species, there are differing points of appeal, such as the glossy white-speckled leaves of *Aloe jucunda* or the triangular banded wedges of an *Aloe variegata* rosette. One of my favourites, however, has always been *Aloe humilis*, with its tubercled, glaucous little fingers for leaves and its fiery little spikes of scarlet flowers, figs 33 & 34. In the 1980s I began a series of Aloe hybrids centring on *Aloe humilis* var. *echinata* and other species of small stature that I thought might combine well with it. In particular, I crossed *Aloe humilis* with *A. pratensis* fig. 35, *A. glauca* fig. 36, *A. pachygaster* fig. 37, *A. claviflora*, and *A. erinacea* fig. 38. I refer to these hybrids

Fig 33. *Aloe humilis* 'Hummel's Select'. Fig. 34. The flowers of *A. humilis*.
Fig. 35 *A. pratensis* x *A. humilis*.



Fig. 34



Fig. 35

Fig. 36.
Aloe 'White Fang' (*A. humilis* 'Edward Hummel' x *A. glauca*)

Fig. 37.
A. pachygaster x *A. humilis*

Fig. 38.
Aloe humilis x *A. erinacea*

Fig. 39.
Aloe [(*pachygaster* x *humilis* 'Edward Hummel') x (*A. humilis* 'Edward Hummel' x *A. glauca*)]



Fig. 37



Fig. 36



Fig. 38



Fig. 39

and the subsequent generations descending from them, fig. 39, as the Spiny Dwarf series. I am also fond of *Aloe longistyla*, and I attempted hybrids between this and *A. humilis*, but found the resulting plants to be rather weak growers and very prone to attack by mealy-bugs, so I abandoned that tack. *Aloe melanacantha* might well have been included in the breeding program as well, but it is quite close to *A. erinacea*, and the glaucous leaf-colour of the latter led me to use it instead. There is also much to be admired in the miniature Madagascan species of *Aloe* with interestingly-textured leaves, such as *Aloe parvula*, *Aloe descoingsii*, and *Aloe haworthioides*. However, their small flowers and lax inflorescences worked against what I wanted to aim for florally, so I did not use them in this breeding program.

After embarking on the hybridizing efforts outlined above, I began a second group of crosses inspired by the well-known hybrid named *Aloe x spinosissima*, a plant that has always appealed to me. It is reputed to be a hybrid between *Aloe humilis* and *A. arborescens*, and the influence of *A. humilis* is evident in its leaves. While it loses some compactness due to the *arborescens* genes, it gains greatly in flower-power in the bargain. The thought occurred to me that if *A. humilis* could combine so well with a large plant such as *A. arborescens*, why not try it with other spectacular-flowering species such as *Aloe ferox*, *A. marlothii*, and *A. excelsa*? (Figs. 40-42) These species not only have very showy candelabras of brightly-coloured flowers, but also

possess a spininess of leaf that I thought would meld well with the tuberculate texture of *Aloe humilis*. In addition to the three species mentioned above, I included *Aloe africana*, *A. petricola*, and *A. aculeata* in the mix. Many of the resulting hybrids have considerable horticultural appeal in themselves, but they are a little on the large side for what I was seeking. Thus, my next step is recombining them with each other and with the results of my first series of crosses in order to get an array of plants from which I might select for outstanding combinations of leaf and flower characteristics, while keeping the plants small. I am proceeding with this effort at present, and over the next few years I hope that many of the resulting batches of seedlings will attain flowering size and reveal how successful I have been.

Fig. 40. *Aloe humilis* x *ferox*

Fig. 41. *Aloe humilis* x *marlothii*

Fig. 42. *Aloe humilis* x *excelsa*



Fig. 40



Fig. 41



Fig. 42

Notes on the propagation of *Haworthia*.

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Introduction

As succulent growers, it is always our wish, for a number of reasons, to propagate our plants. We need to ensure that we always have spare plants in case the parent plants die, we may wish to be able to share our beloved plants with others of similar interests, we may propagate for the purpose of conservation etc. Whatever the reasons, we are always learning how to propagate more effectively. This adds tremendous pleasure to our hobby. When we propagate, we witness the magic of plant growth. In the process, we extend our care, love and patience to the plant world. We appreciate how seeds germinate, produce seedlings and grow into adult plants. We are amazed when a leaf, or a root or a portion of it, eventually produces a whole plant or a quarter plant regenerates into a whole plant [Fig.1, front cover. Just a single plant (variegated *Haworthia pygmaea*) from a quarter plant after 3 years!]. We enjoy the process of creating new life and new distinct plants. Life is not perfect. Occasionally, our lovely little plants die. We may feel sad. However, we understand that it happens naturally and is normal. We have done our best! We learn from the process. We accept losses as a part of our lives. The more we learn, the more we become aware of how little we know. Knowledge is without limit. The wonder and beauty of plants gives us the motivation to experience and learn more. The following is a short account on my experience of *Haworthia* propagation.

Seed-sowing.

This is the universal way of propagation for all haworthias. Large number of individuals can be obtained in a few years' time. This sexual reproduction gives variation in the offspring. Some may be much choicer than the others. Sometimes we have surprises. The individuals may be very distinct. Cristates, variegates and monstrose forms are the extremes. Within the previous six years, I did encounter one cristate and one variegate amongst the seedlings of *Haworthia*. Seed-sowing is always enjoyable and exciting to me.

Some haworthias need to be propagated by this method, as they resist other methods. Examples are: *arachnoidea* v. *scabrispina*; *arachnoidea* v. *aranea*; *bolusii* (small form), *cooperi* v. *venusta*; *lockwoodii*; *marumiana* v. *dimorpha*; *marumiana* v. *archeri*, *nortieri*; *pubescens*; *pulchella*; *semiviva*; *springbokvlakensis*; *bruynsii*, *koelmaniorum*;

sordida; *scabra* (solitary form); *kingiana*; *marginata*; *pumila*.. A full discussion on seed-raising will be dealt with in later articles.

Offsets.

This is the easiest method for those haworthias which naturally produce offsets. For the solitary ones, we need to induce offsets by removing or damaging the growing



Fig. 43

Fig. 43. Offsets from a *Haworthia pumila* hybrid after removing the top.
Fig. 44. Second round of buds emerging after the first harvest.



Fig. 44

point. This can be done by cutting off the top. Figure 43, page 17, shows offsets produced following the removal of the top. Figure 44, page 17, shows a second round of offsets emerging after the first round of offsets have been removed. There are several ways to remove the top. One way is to use a sterilised sharp knife. If space between leaves is too narrow to insert the knife, a thin metal wire can be used instead. Examples which are suitable for forced offsetting are: *bayeri*; *emelyae*; *bolusii*; *lockwoodii*; *mutica*; *retusa* (solitary forms); *semiviva*, *kingiana*; *marginata*; *pumila*.

Leaf-cutting.

A fuller description can be found in an earlier article [Alsterworthia 2(1):8-9]. A general guideline for greater chance of success with leaf-cutting is that the leaves are thick and healthy. However, it does not mean that thin and unhealthy leaves must fail. Nothing is impossible! Just try your luck! One sad experience is that hard-leaved haworthias seem very reluctant to root and send out plantlets.

This year I came across a very strange phenomenon. Look at figure 45. Guess what? It looks like a *Conophytum* emerging from a dead papery leaf. This is indeed a *Haworthia* plantlet emerging from its mother leaf. The new plantlet absorbed nutrients from the mother leaf which became a papery skin. Finally the plantlet broke out of the sheath. This phenomenon occurs with the leaves of *Haworthia* ‘Green Gem’ and *Haworthia* ‘Hakuteijoh’. Figure 46 shows two plantlets emerging normally.

Root-cutting.

To use this method, the root must be thick. There should be enough nutrients/stored energy to support the growth of new plant from the root. I have tried the followings with success: *bayeri*; *emelyae*, *emelyae* v. *comptoniana*; *truncata*; *mirabilis* v. *badia*, *mirabilis* v. *beukmannii*; *retusa* (solitary form).

The easiest and best way to obtain root cuttings is to remove the whole plant from the pot while leaving some roots behind. To do this use a sharp knife to cut carefully some thick roots at the base of the plant before it is removed. The plant with roots can then be removed and potted up. This process ensures that the root cuttings are not disturbed too much and some feeder roots are still functioning. This maximises the chance of success. If this cannot be done, just pot up roots with fresh compost and keep it moist but not wet. When the roots are established, they look turgid (figure 47), occasionally greenish in colour. It takes one and half month to more than a year



Fig. 45



Fig. 46

Fig.45. *Conophytum* or what?
 Fig. 46. *Haworthia* ‘Hakuteijoh’ plantlets produced by one leaf.
 Fig. 47. An established *Haworthia truncata* root.
 Fig. 48. A *Haworthia mirabilis* v. *beukmannii* root with a bud emerging.
 Fig. 49. A *Haworthia truncata* plantlet from a root



Fig. 47



Fig. 49



Fig. 48

for the first emergence of bud. Figure 48 shows the emergence of a bud of *Haworthia mirabilis* v. *beukmannii*. Figure 49 shows a little *Haworthia truncata* growing from its mother root while figure 50 shows several *Haworthia emelyae* v. *comptoniana* plantlets on two roots.

Whole plant divisions.

When plants are solitary and reluctant to offset, they can be forced to offset. The division of a whole plant is just a way to encourage offsetting. To carry out this method, the plant involved must be big and healthy. It is cut into a number of parts vertically right through the centre (growing point). Traditionally, the Japanese divide the plant into 4 parts. The knife used must be sharp and sterilised. Ideally each portion contains its own roots and with a damaged growing point. Some of the leaves are not whole. The plant portions are then left about a week to allow the wounds to dry before potting. Figure 51 shows a quarter of *Haworthia emelyae* v. *comptoniana* regenerating. If the growing point in a portion is damaged or removed, several plantlets will be produced, figure 52. Otherwise, only one plant will be generated.

Grafting?

So far I have not seen a grafted *Haworthia*. Theoretically it is possible and it seems to be the only possible method to propagate haworthias without chlorophyll or with not enough chlorophyll to sustain the plant on its own roots. Or, it might be used to propagate very slow growing haworthias such as *H. bruynsii* and *H. pubescens*. Still further, it might be used to propagate cristate haworthias which tend to push the plant body out of the soil after growing for some time. It would be very interested to know of any such attempts!

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Fig. 50

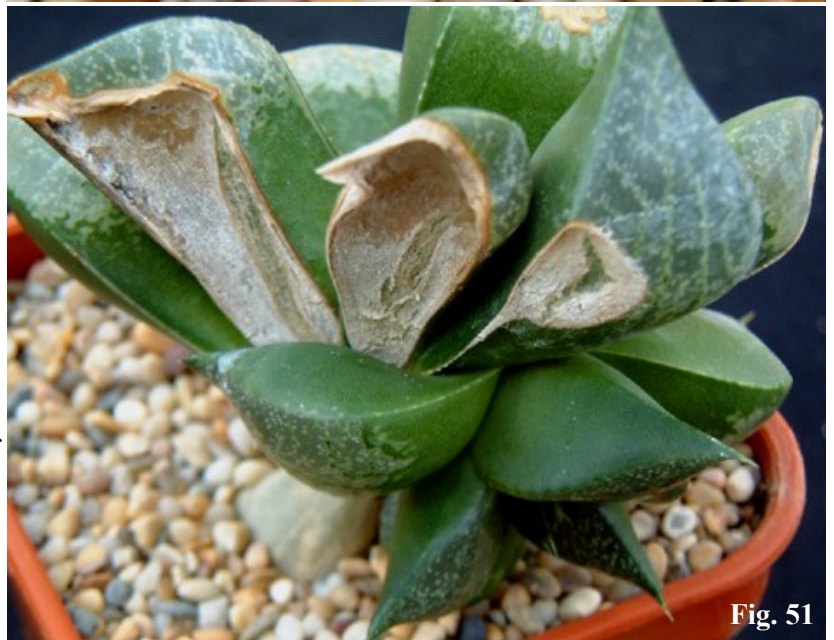


Fig. 51



Fig. 52

Fig. 50. *Haworthia emelyae* v. *comptoniana* plantlets from roots
 Fig. 51. *Haworthia emelyae* v. *comptoniana* regenerating from a quarter plant
 Fig. 52. Several variegated *Haworthia bayeri* offsets from a quarter plant after 3 years!

Haworthia magnifica var. *splendens* (J.D. Venter & S.A. Hammer) Two different localities, two different species?

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Introduction

During 1998, Venter and Hammer described *Haworthia magnifica* var. *splendens* from a locality west of Albertinia. They also mentioned “the recent discovery of an ambiguous population east of Albertinia”. In *Haworthia Revisited* both plants (from East as well as West of Albertinia) are regarded as *H. magnifica* var. *splendens*. Dr Hayashi, however, described the plants from East of Albertinia as *H. esterhuizenii*. By doing this, Dr Hayashi drew my attention once again to the plant that I had a close relationship with in the early 1990’s. Although he mentioned that I was the real re-discoverer of *H. splendens* in the field, I would like to put this in perspective and also give my view on *H. magnifica* var. *splendens*.

Discussion

Plants from type locality

During 1992 Kobus Venter showed me an interesting plant in his collection and asked me for my opinion. My honest reaction was that the plant was so unreal that I did not think that one would be able to find it in the wild. He mentioned that he had some indication as to the farm on which it grew. During 1993 we went to look for the plant on that farm, but without success. The farmer mentioned that we were welcome to have a look for the plant on his other farm. It was on that farm where I first noticed the plant. It is unnecessary to say what our topic of discussion was that evening around the “Braaivleisvuur” barbecue in Still Bay!

In an article “More notes on *H. magnifica* and *H. heidelbergensis*”, I referred to *H. magnifica* var. *splendens* when I wrote “Westwards near Dekriet a very strange looking plant (JME 22/93) is found (Fig. 3) with the structure of *H. retusa* var. *retusa*, but with dark and rough leaf surfaces.” In the years thereafter I explored the field northwest of the type locality to establish its relationship with *H. magnifica*. The only *H. magnifica* plants found, were the typical dark purple/brown plants, which also grow between Riversdale and Heidelberg (See fig 53). This is only a few km west of *H. magnifica* var. *dekenahii*. More recently I explored the areas 13 km east and 13 km west of the type locality of *H. magnifica* var. *splendens*, but without success. This is not to say that the plants are not there. Anyone who has been to the veldt will realize that one can easily miss a locality by searching either a meter to low or to high. I must admit that up to now I had minimal success in the coastal areas as far as new localities are concern. Every time I return from a fruitless outing in the coastal area I convince myself that it is just as important to know where plants do not grow as well as to know where they do. When I returned from the Olifantsberg, south of Albertinia, for the first time since I re-discovered *H. magnifica* var. *splendens* in 1993, I drove past the locality and still cannot believe that one find a *Haworthia* there. For me it is the most uninteresting habitat for *Haworthia*. If someone today would say that I must spend time in a similar habitat, I am sure that my courage will let me down. Maybe it is only such an unbelievable habitat that can produce such unbelievable plants.



Fig. 53

Fig. 53. *Haworthia magnifica*. Typical purple brown form.

Fig. 54. ISI 2004-25. *Haworthia magnifica* v. *splendens* = *Haworthia esterhuizenii*.



Fig. 54

The relationship with the *H. magnifica* “mainstream” remains unknown. Nowhere in the description of the plant could I really find a logical reason why it is a variety of *H. magnifica* and not a species on its own.

Marx explained the relationship by writing “Unlike some other varieties of *H. magnifica*, which can be rather dirty and unimpressive in the wild, *H. magnifica* var. *splendens* shines with the same splendour as perfectly cultivated specimens. Its habitat of growth in the wild and general resemblance to *H. emelyae* is indeed very close, but it differs from *H. emelyae* mainly in its florescence and flowering time, which corresponds more closely with that of *H. magnifica*. A further link with *H. magnifica* is that there are populations of var. *magnifica* which share the dark colours, pimpled upper leaves and a tendency

towards glossiness”.

Robert Kent wrote in Cactus and Succulent Journal (U.S.) Vol 70 (1998) “Here is *H. magnifica* var. *splendens*, long known under many pseudonyms, but for the first time described in the last issue (although I would have preferred to see it published as a full species)”

H. magnifica var. *splendens* for me stand in the same relationship to *H. magnifica* as *H. picta* to *H. correctata* or *H. mutica* to *H. retusa* and should therefore be treated in the same way and that is as a separate species. Although in my original framework I regarded it as a variety of *H. asperula* (*H. magnifica*), after taking note of the reasoning of Breuer and Hayashi I am now convinced that it should be a species in its own.

Plants from east of Albertinia

The plants from east of Albertinia are somewhat more difficult to place either as *H. magnifica* var. *splendens*, a variety of *H. splendens*, a species on its own (as seen by Dr Hayashi), or a variety of another species (*H. acuminata* or *H. paradoxa* etc.). The shape of the leaves is more like that of *H. acuminata*, but with the colourful surface of *splendens*.

This plant is constantly referred to as the "Parisi plant" or the "Splendens type plant from east of Albertinia". It is so different that whenever someone writes about *H. magnifica* var. *splendens*, he refers to this plant’s differences:-

- It started off in the original description of *H. magnifica* var. *splendens* when the authors wrote “In this connection, another factor should be noted: the recent discovery of an ambiguous population east of Albertinia that blooms over a long season, starting in the late winter! These plants have many characters of var. *splendens* but, especially in their white-flecked lower leaf surfaces, they also resemble the plants currently known as *H. magnifica* var. *major* (G.G.SM:) M.B. Bayer; occurring ca. 50km to the NW of Albertinia.”
- At the end of the description “It is also likely to be its last, unless the taxon is found further a field or is defined so broadly as to the accept the ambiguous population from East of Albertinia.”

- Marx continues in Aloe 35:3&4 1998 with “In 1994 Mary Parisi and Ed Dunne from California visited South Africa and explored, amongst other areas, the hills to the east of Albertinia. Here they discovered something very similar, yet also somewhat different from *H. magnifica* var. *splendens*, Dunne & Parisi 94-01. It shares the pimpled and glossy upper leaves of var. *splendens* (although not as highly polished), but differs by having lighter coloured, smaller and more acuminate leaves, which have flecked leaf sides in contrast to var. *splendens*, which has unmarked, chocolate brown to dark green leaf sides. A further and most important difference is the flowering time, which is mainly in late winter (I say mainly, because in cultivation in Grahamstown it flowers twice or more per year!). The typical *H. magnifica* var. *splendens* flowers only once per year and, as said, in early summer. Both the development of flowers and the general speed of growth is also much slower in *H. magnifica* var. *splendens* than in the *Dunne & Parisi* plants.”

- Mary Parisi wrote in her article “Haworthias in the field” Cactus and Succulent Journal (U.S.) Vol 70 (1998). No.4. “The plants are thought to be close to *H. magnifica* var. *splendens*, time will tell where their ultimate placement will be. They have different flowering time from that of the plants at the other locations of var. *splendens* and their leaf-shape is narrower. Also the sides of the leaves are covered with tubercles, whereas “typical” var. *splendens* has solid green sides.”

- If that is the case, it is no surprise that Hayashi named the plant, found by Dunne and Parisi east of Albertinia, in Haworthia Study: “**H. esterhuizenii Hayashi M. Spec. Nov. Type: Hayashi 96-6 (Albertinia).** Affinis *H. splendens*, sed foliis opaca, angustiore, foliidorso maculata differt. (See fig. 54).

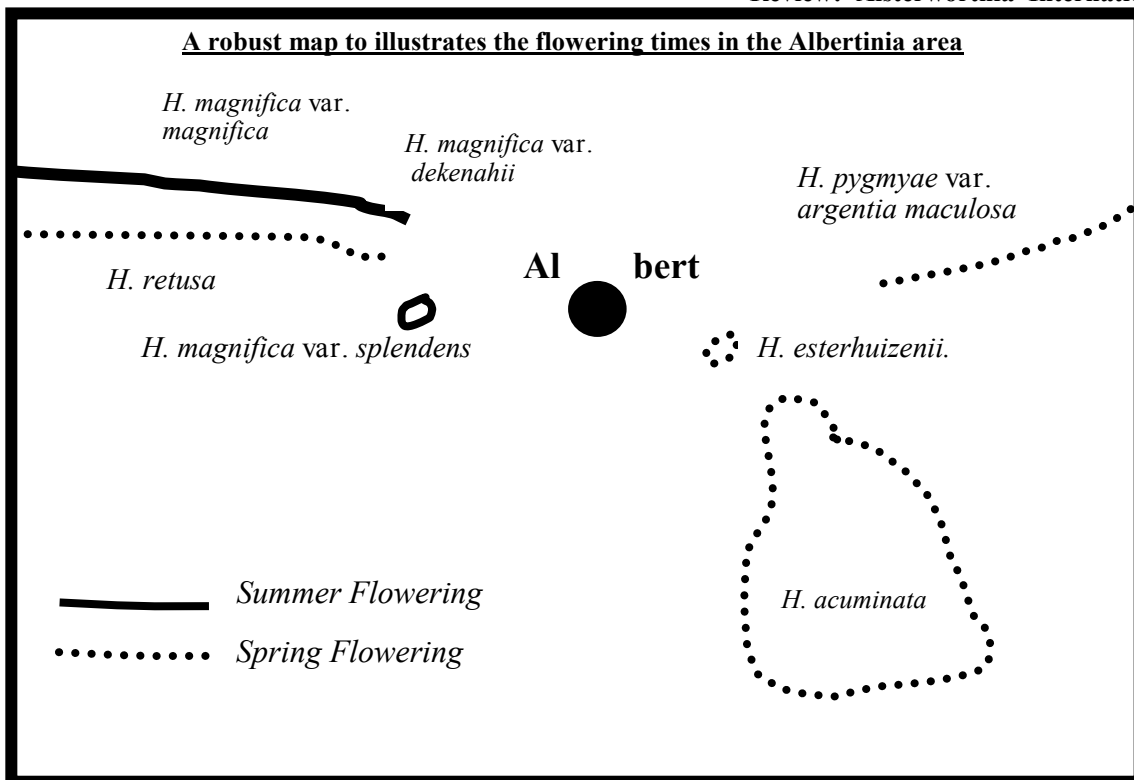
- “This is “pseudo splendens” found by Dunne & Parisi. The name was dedicated to Mr. J.M. Esterhuizen, the real re-discoverer of *H. splendens* at field.” (In an article called Localities of Haworthia 1. Haworthia Study No. 8 (2002.12) Dr Hayashi shows the differences with a number of coloured pictures)

- Breuer wanted to name it *H. albertinensis* n.n. and Paul Forster wrote in Alsterworthia International in his **Book Review: Alsterworthia International, Special Issue No. 1.**

Ingo Breuer An Haworthia species concept update “Some of the “new species and varieties” to be recognised such as *H. albertinensis*, *H. jansenvillensis*, *H. tradouwensis* and *H. multifolia* var. *sandkraalensis* are so obvious that it is a wonder that they haven’t been named already”.

- In my framework I regarded it as a plant different from *H. magnifica* var. *splendens*.

I am convinced that naming the plant is correct, but still not convinced that the plant is placed correctly. The area East, and South East of Albertinia is not that well explored to determine the plant’s relationship with



plants found to the south of the current locality, specially also with the *acuminata* complex explored by Vincent de Vries. Therefore Mary Parisi's words "time will tell where their ultimate placement will be" still remains valid.

Conclusion

One of the most important goals of plant taxonomy is to develop a uniform, practical, and stable system of naming plants that can be used by both taxonomists and others needing a way to communicate information about plants.

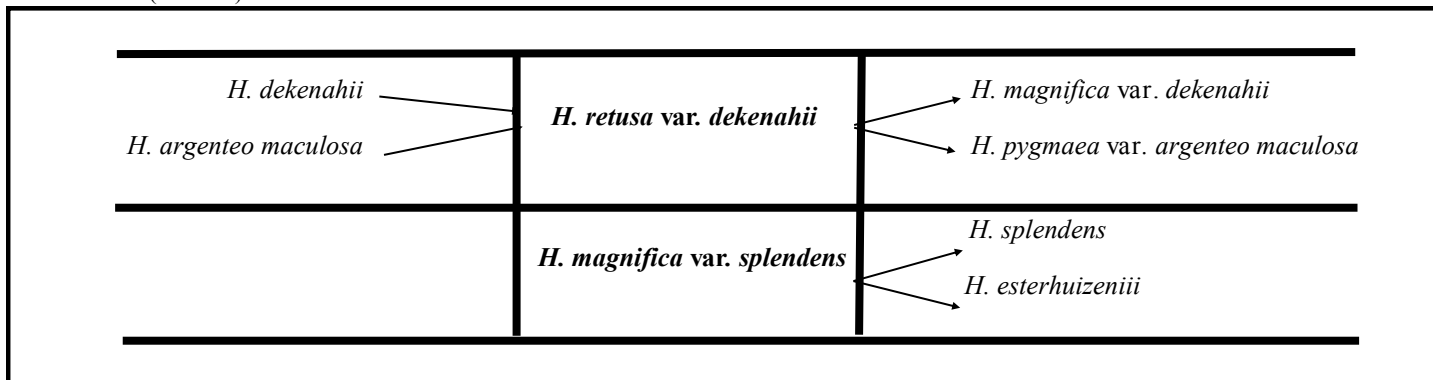
H. magnifica var. *splendens* reminds me very much of a similar situation where two different plants were put together as *H. retusa* variety *dekenahii*. All the time these two plants were referred to as the scabrous Draaihoek plant flowering in summer and the more smooth Cooper plant flowering in spring. Applying the criteria of floral characters, flowering time, type of habitat, morphological characters of the plant, distribution and localities, it becomes clear that the current view on the two plants seems more correct. Should the same criteria be applied to *H. magnifica* var. *splendens* one may come for the moment to the conclusion as illustrated below.

Bibliography

- Bayer, M.B. 1974.** New Haworthias. Cactus and Succulent Journal (US) 42:75.
Bayer, M.B. 1975. The "Retuse" Haworthias. Excelsa 5:86.
Bayer, M.B. 1980. A story of Haworthia nitidula. Cactus and Succulent Journal (US), 52:11.
Bayer, M.B. 1982. The new Haworthia handbook. National Botanical Gardens of South Africa, Kirstenbosch, Cape Town.
Bayer, M.B. 1978. Reflections on G.G. Smith's Haworthia collection, Excelsa 8:46-52.
Bayer M.B. 1999. Haworthia Revisited, Umdaus Press
Dr. Hayashi 2002 Localities of Haworthia 1. Haworthia Study No. 8 (2002.12)

- Dr. Hayashi 2002** Some new species of section Retusae. Haworthia Study No. 7 (2002.7)
Hammer, S. 1998 An old new variant of Haworthia magnifica Poelln. Cactus and Succulent Journal (U.S.) Vol. 70, No 4, 180-182
Mary Parisi 1998. Haworthias in the field Cactus and Succulent Journal (U.S.) Vol 70 No.4.
Marx 1998 Introducing a new and aptly named Haworthia: *H. magnifica* var. *splendens* J.D. Venter & S.A. Hammer Aloe 35:3&4
Paul Forster 2003 Book Review of Alsterworthia International, Special Issue No. 1. Ingo Breuer An *Haworthia* species concept update. Alsterworthia International Vol. 3. Issue 3
Robert Kent 1998 Cactus and Succulent Journal (U.S.) Vol 70. No.5.
Scott, C.L. 1973. A revision of the genus Haworthia, section Retusae. Aloe 11:40.
Scott, C.L. 1985. The genus Haworthia : a taxonomic revision. Aloe Books, Johannesburg.
Smith, G.G. 1948. Some new species and varieties in the genus Haworthia. The Journal of South African Botany, 14:42.

Photo. 53 JM Esterhuizen. 54 John Trager.



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Dealing with intergradation of species

Len E. Newton
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Norbert Göbl (2004) has touched on some different situations in his article. He points out that environmental change can lead to evolutionary change because successive generations become adapted to the changing environment by the process of natural selection. Then he asks when diverging populations can be regarded as new species or varieties. More interestingly, he asks about distinctive “invisible” characters, such as cold tolerance. This last point caught my eye because I have found plants in Kenya that are morphologically identical as *Aloe rabaiensis*, but differ in the colour of the leaf exudate.

Traditionally, morphology has been used as the basis for sorting plants into different taxa. Attributes taken into account include shape, size, surface features and arrangement on the plant of visible structures. Eventually another factor was introduced, namely reproductive compatibility. This led to what was called the “biological species concept”. A species was defined as “a series of intergrading and interfertile populations, morphologically distinct from and reproductively isolated from other such series”. Therefore two criteria are used to distinguish between species — discontinuity in the range of morphological variation and inability to interbreed (i.e. to produce fully fertile offspring). Theoretically it should be possible to apply this concept in assessing relationships between populations, but in practice it can take many years to determine reproductive compatibility because this involves crossing experiments and study of the next generation when they start to flower.

From the above it is seen that physiological characters such as cold tolerance are not taken into account in determining taxonomic relationships. Of course it is known that there is such physiological variation, and the breeding of crop plants includes making use of variants with greater degrees of disease resistance, drought tolerance, etc.

When seemingly different populations do not have both discontinuity in variation and reproductive isolation, they can be treated as infraspecific taxa. If the different populations occupy different geographical areas they are treated as subspecies, e.g. *Aloe volkensii* subsp. *volkensii* and *Aloe volkensii* subsp. *multicaulis*. When the populations approach closely or even overlap in their geographical ranges they are treated as varieties, e.g. *Aloe lateritia* var. *lateritia* and *Aloe lateritia* var. *graminicola*. Minor variants within a population that persist from generation to generation are designated as forms — there is no currently accepted example in the genus *Aloe* but *Lithops optica* fa. *rubra* will illustrate this rank (though treated as a cultivar by Desmond Cole). However, a study carried out just over ten years

ago showed that there is no consistency in the use of infraspecific ranks by different authors (Hamilton & Reichard, 1992).

Now let us turn to the situation where a species has a very wide range of geographical distribution. In many such species, plants at one end of the range have recognisable differences from plants at the other end, yet they are linked by a series of intermediate populations. This is called clinal variation. Such populations are regarded as belonging to a single species, and the implication is that adjacent populations anywhere along the range of distribution are inter-compatible. It is the reproductive isolation of a population (or local cluster of populations) that could lead to speciation, as local environmental selection factors result in morphological discontinuity in due course. Both criteria of the biological species concept will then have been achieved.

I am trying to explain fairly briefly some principles that form a large subject, often called biosystematics. Textbooks on the principles of plant taxonomy published during the last few decades (e.g. Stuessy, 1990) should be consulted by those wishing to know more.

Let me end by correcting the opening of Norbert Göbl’s first sentence. It is not the case that the name Linnaeus is a Latinised form of Linné. Although Latin in form, Linnaeus is a Swedish name. Linné is an abbreviated form of Linnaeus, and was adopted when Linnaeus was ennobled by the Swedish government (as Carl von Linné) in later life. More details on the name “Linnaeus” are given by Stearn (1992).

References

- Göbl, N. 2004. Philosophical views about the intergradation of species. *Alsterworthia International* 4 (2): 25, 27.
- Hamilton, C.W. & Reichard, S.H. 1992. Current practice in the use of subspecies, variety, and forma in the classification of wild plants. *Taxon* 41: 485–498.
- Stearn, W.T. 1992. *Botanical Latin*. Edn. 4. David & Charles, Newton Abbot.
- Stuessy, T.F. 1990. *Plant Taxonomy. The Systematic Evaluation of Comparative Data*. Columbia University Press, New York.



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