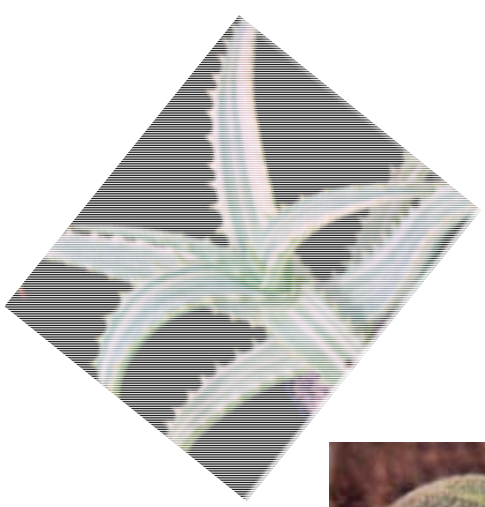
Hybrids & Cultivars

of the

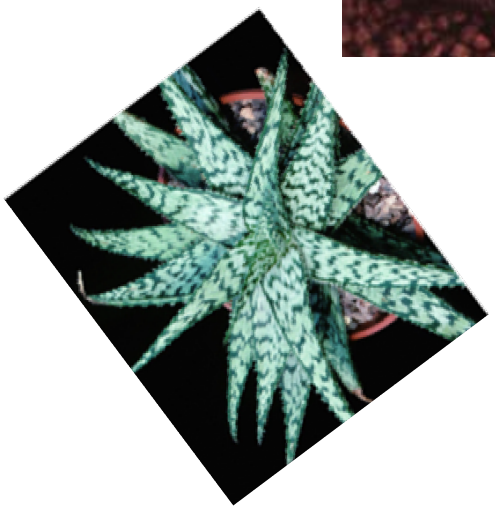
Succulent Asphodelaceae

Volume 1.

Aloe, Astroloba, Bulbine, Gasteria & Nothogenera







Contents.

Editorial Observations

Harry Mays
Woodsleigh, Moss Lame, St Michaels on Wyre, Preston, PR3 0TY, UK
hmays@freenetname.co.uk

The International Code of Nomenclature for Cultivated Plants (ICNCP) lays down the rules for naming cultivars; the International Code of Botanical Nomenclature (ICBN) the rules for naming wild plants. The International Organisation for Succulent Plant Study (IOS) is the recognised central authority for recording and checking names published under the ICBN. New names, both valid and invalid, can be found in the IOS annually-produced Repertorium Plantarum Succulentarum (RPS). This is the reference centre for wild plant names, which can be accessed by anyone. It performs a valuable service.

The ICNCP provides for International Registration Authorities to register cultivars - each for selected groups of genera - and produce appropriate material. For a variety of reasons Registration Authorities have not been appointed for all genera, consequently there are no central records for some cultivars including those of haworthias, aloes and gasterias. There was once an International Registration Authority for aloes, but it ceased to function some time ago. It did not respond to my and other peoples enquiries before it ceased to exist and it has not subsequently proved possible to obtain any details of their records .

Books dealing comprehensively with a genus are relatively common. There you find the species listed, described and probably illustrated, but cultivars do not get the same systematic treatment. For example, the six volumes of the *Illustrated Handbook of Succulent Plants* cover all genera and accepted species, but for practical purposes cultivars are ignored. Similarly *Haworthia Revisited - A Revision of the Genus* deals comprehensively with all the Haworthia species, but it is silent about the cultivars. *Gasteria of South Africa - A New Revision of a Major Succulent Group* also records cultivars published by the author in addition to species, but not cultivars published by others and so on.

Some time ago, for my personal use, I started a simple cultivar project to compile a list of cultivars for *Aloe*, *Gasteria*, *Haworthia*, related small genera and their nothotaxa (hybrids between genera). As this progressed, the need to check names and description assumed more and more importance, which encountered more and more problems. It was difficult to impossible to trace the original publications for many names and descriptions. These can be published in any language in almost any written, dated form available to the public, from prestigious books to short lived dealers catalogues no matter how brief. When I edited Haworthiad from 1995 to 2001 I thought the scope for developing my own efforts might be improved. There was even a glimmer of light in that Myron Kimnach, U.S.A. invited me to join a group to deal with collating a cultivar list for all succulent plants. A botanist at the Huntington was to be in charge. It soon became apparent that his main duties did not allow him the time necessary for the successful prosecution of this work and the scheme was abandoned, with some individuals continuing to pursue their own lines of interest. I continued mine and developed them when new opportunities arose on my changing to editing and publishing Alsterworthia International in 2001.

Since I became editor of Alsterworthia International some progress has been made, and more will be, thanks to the assistance of both members and non-members in different countries who are supplying information about cultivars. This has brought to light a number of incorrect names which have been corrected in Alsterworthia International or elsewhere or will be in due course. It has also confirmed that the names of a number of cultivars in circulation have not been correctly published and have not therefore been established under the ICNCP.

The names of cultivars can be a problem. Simply put, to name a cultivar all one has to do is allocate a cultivar name which complies with the ICNCP and add it to the appropriate scientific name - genus/nothogenus, species/ nothospecies (and lower rank if appropriate). Unfortunately this simplicity is devoid of reality because it does not take into account the conflicting and divergent approaches to taxonomy. Whilst the ICBN lays down rules for applying names to wild plants it does not stipulate how to define groups of plants in order to combine those which are the same and separate those which are different. i.e. it does not define a species, the prime category for determining different groups of plants. In the absence of an agreed concept for defining a species, taxonomists define them in different ways. This can results in different classifications with different scientific names for the same plants, all validly published under the ICBN.

The problems of plant variability, the basis of evolution allowing plants to adapt (slowly) to changing conditions, is common to many genera, but particularly so with haworthias. This simple fact can be the basis of few species because they are evolving and extremely variable, Bayer's super species, to Hayashi's many species because, by breaking them down into small groups of plants, many species can be defined on fine detail.

Haworthias have been studied and classified since before Linnaeus. Currently Bruce Bayer (South Africa), Ingo Breuer (Germany) and Dr. Hayashi (Japan) are contributing in major ways to Haworthia taxonomy with others making smaller contributions from time to time. Each has a different species concept resulting in different classification systems. In addition there are DNA studies (and probably more to come) which are producing results somewhat dissimilar from the classifications based on morphology. In brief, Bayer's species concept results in few species, Hayashi's in very many and Breuer's is somewhere in-between and there is no signs of any possibility of a common species concept being agreed in the foreseeable future. Which system should one use for allocating cultivar names? The ICNCP simply stipulates (Article 19.1) that "The name of a cultivar is the correct name of the genus or lower taxonomic unit to which it is assigned together with a cultivar epithet" It does not, and probably cannot, stipulate which classification system is correct and should be use when there are competing classifications. The genera and species used in this publication are generally those listed in the *Illustrated Handbook of Succulent Plants - Monocotyledons* (IHSP-M was published under the auspices of the IOS, editor Urs Eggli). Exceptions are noted in the text. One exception is *H. picta*, which was included in *H. emelyae* v. *emelyae* in IHSP -M. It is treated as a species in its own right in this publication following Hayashi and Breuer. Most *picta* hybrids have been created in Japan and are named as such, both there and in many other countries. Anyone who wishes to adopt a different classification is free to do so. To do this all one has to do normally is substitute the scientific name he wishes to use for the one used in this publication - the cultivar name will remain the same except in the rare case where it duplicates a name already in use in that denominational class. For further guidance please see the ICNCP.

The present state of the cultivar project is that it has

blossomed from being a (limited) list of cultivar names for my personal use to a world-wide list of cultivar names. For some of these the original references have been traced, but certainly not all. Sufficient information is now available for Volume 1 of *Cultivars of the Succulent Asphodelaceae* to be produced. It not only comprises cultivar names for which it seems the correct publication references have been traced, but also a number of cultivars for which references have not been traced. All of these have been in circulation for many years, are well know at least in certain spheres and are likely to be correctly named if only inadvertently in articles or sales catalogues. If you happen to have references for any of these do please let me know. Where an entry has been made under "Description" it is the earliest I have been able to trace. It is possible that an earlier description may exist in some obscure location for a few cultivars. If anyone has knowledge of such prior publication I should be most grateful for details. Copies of publications/descriptions would be regarded as heaven-sent.

Perhaps this is the appropriate place to mention that naming species in accordance with the ICBN and cultivars in accordance with the ICNCP is not obligatory. Nevertheless, all self respecting scientists name plants in accordance with the ICBN. The same degree of rigour is not always used when cultivars are named. It is by no means uncommon for people who create cultivars to distinguish them by letters, number, descriptive names or phrases, codes etc whilst they are developing them. These may then find their way into the literature and may continue to be used as plant names for information and trade purposes. Such names are NOT used as cultivar names in this publication, as they are not established under the ICNCP.

This volume is the product of much work by many people. Without their contributions it could not have been published. Work on volume 2 has already started but additional help will facilitate its publication. Any information on any of the following would be greatly appreciated:

1. Names of cultivars not included in volume 1 (this volume) and where you came across them. (The name of a supplier or breeder etc can sometimes enable us to trace the original publication for a cultivar name.)
2. A photograph where possible for each name. (Not only does this help to define the cultivar, it also helps to eliminate duplicate names.)
3. If possible details of where a species name was originally published. This is essential information for validating a name.
4. If you think you have other information which might be of use do please supply it. It could turn out to be of value.

You can be certain that any information you provide will be put to good use and that it will be recorded and made available for posterity in the following ways:

1. Soft back books will be published from time to time starting with this, the first. The books will be available to booksellers and libraries at about cost price including postage. Each will have a recommended price for the public. Few are likely to be sold to the public direct by me, as I do not have the time to deal with individual sales. Book dealers will be the main method of distribution.
2. In due course lists of cultivar names with references to original publications will be available from me free of charge by file attached to e-mail or for a small charge by post to cover costs. E-mail is preferred as it involves less work. Time is of the essence as they say!
3. Lists of names for which original publications have not so far been traced will also be available free of charge as above. I am ever-hopeful that someone may be able to assist with tracing the required information.
4. If possible I am willing to make additional information available free of charge by e-mail on request.

All my records - papers, disks, publications, etc - will be passed on to a recognised authority in due course. Some members of the Commission for the Nomenclature of Cultivated Plants are also officials of the Royal Horticultural Society and it has been indicated that the RHS is willing to accept my records for safe keeping. The Herbarium, RHS Garden Wisley, Woking, Surrey, GU23 6QB, UK is one of a number of world-wide organisations maintaining nomenclatural standards for cultivars (see Appendix IV of the ICNCP). A Nomenclatural Standard is a herbarium specimen or its equivalent such as the original description and photograph(s) to which the name of the cultivar is attached. It defines the cultivar and therefore distinguishes it from other cultivars. For succulents, not many specimens seem to be submitted for preservation, so it is the equivalent which is normally sent for recording purposes.

Details of all new cultivars published in Alsterworthia International are automatically sent to the RHS Herbarium at Wisley for recording. The Herbarium will also gladly receive a specimen for preservation if one can be spared.

This cultivar project is run on a voluntary basis. All projects incur costs, but as I have a small commercial printer, binder, guillotine and a PC there are no capital costs to meet, only running costs. These are being kept well within reason.

Finally, and with a note of deep regret, I am concerned that I am not able to record my thanks individually to everyone who has helped in one way or another, directly or indirectly, with the production of this first volume. Some are actually unknown to me. To my great regret the identity of some has been lost with the passage of time. In many cases just a small piece of information or a photograph has been invaluable. In other cases much information and many photographs have been supplied after much effort by a few people. To all who have assisted I wish to express my sincere appreciation. Their assistance has resulted in the production of this volume, but I accept full responsibility for the contents. No doubt readers will advise me of any additional information they may have, which would add to the information already supplied?

The Creation & Naming of Cultivars.

The cultivar.

Generally, a cultivar is a plant, or group of plants, with special characteristics, which is maintained in cultivation by man rather than in habitat by nature and is different from all other cultivars.

A cultivar may be a particular clone or clones from a wild population selected for unusual characteristics, which are rarely found in other plants in that species. The unusual characteristics will not normally be reproduced by seed in habitat. Seed produced by cross pollination combines half the genes from one plant with half from another, consequently the progeny have a different mix of genes from the desirable clone, which may not reproduce the desired characteristics. By selecting a clone with desirable characteristics for vegetative propagation, the desirable features are preserved and the number of plants with them is increased - a cultivar is created.

Many cultivars have a much more complex origin than the simple selection and vegetative propagation of a wild plant. They are created and then preserved by man. In wild plants there are (rare) alternative forms of genes (known as alleles), which may be found in only a few plants and which may be visibly expressed in one way or another in even fewer plants. Random crosspollination rarely results in progeny expressing characteristics produced by the rare genes, but these may be the characteristics worthy of consideration for cultivar status. Random propagation is a hit or miss affair with many, many misses!

The alternative to random crosspollination is selective, which may increase the chance of producing cultivars with selected characteristics enhanced and/or combined. New ones may sometimes be produced. Crosses may be within species or between species of the same genus or even between different genera. This is not a fast process. The key to success is selection and luck. The original plants for cross pollination are selected for characters which are to be introduced into the progeny and enhanced. The progeny will be variable. Only those showing the best characters will be selected for crossing either with a parent plant or between themselves. The rest are thrown away. The crossing of progeny either with a parent or between themselves may be done through several generations to enhance a character. Only the best are retained and used for cross pollination at each stage. The rest are discarded. The compost heap will receive generous contributions during this process! Finally, one or a few very attractive plants, each with some differences, will be produced. Each one may then be propagated vegetatively to preserve its characteristics and given a cultivar name. Crosses within species may have the appearance of the species but with enhanced or even new characters. Crosses between species may differ to a lesser or greater extent from both parent species and multiple (complex) hybrids may look nothing like any species. Many examples will be found in this publication.

Whilst hybridisation is an accepted way of producing new cultivars, it is not always possible to cross species. Though some species of a genus may not cross, others may cross with species of a different genus. The ability to cross species may denote a closer relationship whilst inability denotes a more distant relationship. Some species may have diverged so far from others that they are incompatible and thus cannot produce seed. Although much is known about the ability of species to cross, nothing is certain. Attempting to cross two species a number of times is the best way to establish if it is possible. It is by no means impossible for a few seed to be produced on a rare occasion from the crossing of two species "known" to be impossible. Any resultant plants may be very desirable cultivars.

Among cultivars, variegated plants are popular. In some species variegation occurs naturally on rare occasions and these plants are selected for propagation, but in some species variegation is not at present known to occur naturally. The Japanese reportedly produce variegation in these species by crossing them with a variegated species. This of course produces a hybrid. To obtain the original non-variegated species in variegated form the best variegated progeny of the cross are crossed back to the non-variegated parent species. The objective is to increase the proportion of nuclear genes of the non-variegated species and reduce the proportion of genes of the variegated species, whilst retaining that species genes for variegation. In simple terms, the hybrid from the first cross will have 50% of genes from the non-variegated species and 50% from the variegated. The first back cross will have 50% of genes from the non-variegated parent and 50% from the variegated hybrid of which half will be genes from the non-variegated parent and half from the variegated. The progeny of this cross will, therefore, have 75% of its genes from the non-variegated species and 25% from the variegated species compared with 50/50 in the first cross. The second back cross will produce progeny with 87.5% of genes from the non-variegated species and 12.5% from the variegated, fig. 1. Successive back crosses of the best variegated progeny with the non-variegated species will reduce the proportion of genes from the variegated species so that plants identical in form to the non-variegated species will be produced, but with variegation. Technically they will still be hybrids, but the proportion of genes contributed by the variegated species will be so small that the only visible effect they have is variegation in a species that did not have natural variegation. At this stage the plants will be popularly listed as a variegated species though technically they are still variegated hybrids. Many variegated Japanese Haworthia truncata have been produced in this way.

Fig. 1. Nuclear gene flow chart.

A	**x**	**B**	=	**H1**
50%		50%		50%A+50%B
A	**x**	**H1**	=	**H2**
50%A		25%A+25%B		75%A+25%B
A	**x**	**H2**	=	**H3**
50%		37.5%A+12.5%B		87.5%A+12.5%B

A = non-variegated species. B = variegated species. H = Hybrid

Nuclear genes are passed to progeny by both parents, but the small quantity of genes in other cells (organelles) are normally passed to progeny only by the seed bearing plant, not by the pollen donor. Consequently, variegation cannot be introduced into a non-variegated species by using pollen from a species in which the organelle genes determine variegation. You can only tell by trial crosses which genes contain the variegation, and for this to be possible the plants must be compatible. If they are not, which genes contain the variegation is irrelevant.

A further method of introducing variegation and other cultivar characteristics such as monstrosity and crests is by tissue culture. A seed grown plant develops from a single cell. All subsequent cells derived from it contain the same genes and hence the same potential for development.

What makes cells form different tissues is switching different genes on and off by control mechanisms within the plant operating at different stages of development. In tissue culture a few cells from a plant are cultured on gel with a nutrient to provide energy in aseptic conditions. The cells multiply to form a callus of undifferentiated cells. Different chemicals are then added at different stages to promote cell differentiation and plantlet formation. The basic systems are well known and there are even a few keen amateurs undertaking tissue culture at home, but the chemical additives necessary to induce variegation etc are, at present, trade secrets. It is important to note the difference between variegation resulting from genes and that resulting from chemical interference with biochemical pathways. If chemicals bring about a permanent change in genes the variegation may be permanent, but if they do not, if they simply interferes with biochemical pathways, once the effects of the chemicals are exhausted variegation may be lost.

Perhaps the foremost laboratory engaged in research for the promotion of variegation in succulent plants is Succulent Tissue Culture owned by Dr. Robert Wellens, The Netherlands.

A brief introduction to naming hybrids and cultivars. Hybrids between genera, subgenera and species may be identified by hybrid formula names simply by placing a x between the parents' names e.g. (Haworthia limifolia x Gasteria 'Missu Fuji') x Gasteria nitida v. armstrongii ICBN H 2.1. Art. H.2A.1 recommends that names of hybrid parents should be listed in alphabetical order with the sex symbols attached (♀ = female, ♂ = male). Alternatively the female parent may be placed first, but it must be clearly stated that a non-alphabetical sequence is being used. Regrettably, many hybrid formula names do not follow these recommendations, consequently it is not clear which is the male and which is the female parent. It is important to indicate the sex of the parents because reciprocal crosses (pollen of A to B and pollen of B to A) do not necessarily give results - crossing may be possible one way only.

The alternative to using formula names is to allocate a name to the hybrid, normally made up of parts of the names of the parents - a condensed formula known as a

Fig. 2. Validly Published Nothogenus Names.

All the names below have been validly published and may be used for the crosses indicated. Different authorities may use different nothogenus names because they differ in their acceptance of generic names. In the Illustrated Handbook of Succulent Plants the following six genera are accepted: **Aloe** L., **Astroloba** Uitewaal, **Chortolirion** Berger, **Gasteria** Duval, **Haworthia** Duval, **Poellnitzia** Uitewaal and the following are rejected: *Apicra* Haworth (Referred to *Astroloba*), *Aloinella* Lemée non Cardot, *Chamaealoe* Berger, *Guillauminia* Bertrand, *Lemeea* Heath, *Leptaloe* Stapf., *Lomatophyllum* Willdenow (Referred to *Aloe*). If you accept only the six genera listed in the Illustrated Handbook… only the nothogenus names listed below in **bold** type are relevant, but if you accept any of the rejected genera the appropriate nothogenus name in normal type would be used. For example: if you accept *Lomatophyllum* as a genus, a cross between it and *Gasteria* would have the nothogenus name **×***Lomateria*, but if you reject *Lomatophyllum* in favour of its inclusion in *Aloe* the correct nothogenus name for the same cross would be ×*Gasteraloe.* The species epithet remains the same no matter which nothogenus you decide to use providing it is not a duplicate name in that nothogenus.

Names of nothogenera		**Where published.**
×Alamaealoe	(*Aloe* x *Chamaealoe*).	Heath in Calyx 3(4):153, 1995.
×**Algastoloba**	(*Aloe* x *Astroloba* x *Gasteria*).	Cumming in Haworthiad 13(l):20, 1999.
×Allauminia	(*Aloe* x *Guillauminia*).	Rowl. in Nat.Cact.Succ.J. 22:74, 1967.
×Allemeea	(*Aloe* x *Lemeea*).	Heath in Calyx 3(4):153, 1995.
×Alleptauminia	(*Aloe* x *Guillauminia* x *Leptaloe*).	Heath in Calyx 3(4): 153, 1993.
×**Alolirion**	(*Aloe* x *Chortolirion*)	Rowl. in Nat.Cact.Succ.J.28:7, 1973.
×**Aloloba**	(*Aloe* × *Astroloba*).	Rowl. in Nat.Cact.Succ.J.22:74, 1967.
×Aloptaloe	(*Aloe* x *Leptaloe*).	Heath in Calyx 3(4):153, 1993.
×**Alworthia**	(*Aloe* x *Haworthia*).	Rowl. in Nat.Cact.Succ.J.28:7, 1973.
×**Astroworthia**	(*Astroloba* x *Haworthia*).	Rowl. in Nat.Cact.Succ.J.22:74, 1967.
×**Bayerara**	(*Aloe* x *Gasteria* x *Haworthia*).	Cumming in Haworthiad 13(1):20, 1999.
×Chamaeleptaloe	(*Chamaealoe* x *Leptaloe*).	Rowl. in Nat.Cact.Succ.J.28:7, 1973.
×Chamaeloba	(*Chamaealoe* x *Astroloba).*	Cumming in Bull.Afr.Succ.Pl.Soc.9:36, 1974.
×Chamaeteria	(*Chamaealoe* x *Gasteria*).	Cumming in Bull.Afr.Succ.Pl.Soc.9:36, 1974.
×**Cummingara**	(*Gasteria* x *Haworthia* x *Poellnitzia*).	Rowl. in Haworthiad 13(3): 115, 1999.
×Gaslauminia	(*Gasteria* x *Guillauminia*).	Heath in Calyx 4(4):146, 1994.
×**Gasteraloe**[1]	(*Aloe* x *Gasteria*).	Guillaumin Bull. Mus. Hist. Nat. Paris 3: 339-340, 1931 and 4: 1031, 1932.
×**Gasterhaworthia**	(*Gasteria* x *Haworthia*).	Guillaumin in Bull.Mus.Hist. Nat. Paris 3: 339 1931.
×**Gasterlirion**[2]	(*Chortolirion* x *Gasteria*).	Mays & Rowley Alsterworthia International 6(2)10.
×**Gastroloba**	(*Astroloba* × *Gasteria*).	Cumming in Bull. Afr. Succ. Pl. Soc. 9:36, 1974.
×Leminia	(*Guillauminia* x *Lemeea*).	Heath in Calyx 4(4):146, 1994.
×Leptauminia	(*Guillauminia* x *Leptaloe*).	Rowl. in Nat. Cact. Succ. J.22:74, 1967.
×Lomataloe	(*Aloe* x *Lomatophyllum*).	Guillaumin in Bull. Mus. Hist. Nat. Paris 3:339-340, 1931.
×Lomateria	(*Gasteria* x *Lomatophyllum*).	Guillaumin in Bull. Mus. Hist .Nat. Paris 3:339-540, 1931.
×Lomatoloba	(*Astroloba* x *Lomatophyllum).*	Cumming in Bull.Afr.Succ.Pl.Soc.9: 35, 1974.
×**Maysara**	(*Astroloba* x *Gasteria* x *Haworthia*).	Cumming in Haworthiad 13(3):115, 1999.
×**Poellneria**	(*Gasteria* x *Poellnitzia*).	Rowl. in Nat.Cact.Succ.J.28:7, 1973.

[1]Formerly known as ×Gastrolea, an invalid name.
[2]Formerly known as ×Gastrolirion Walther, an invalid name.

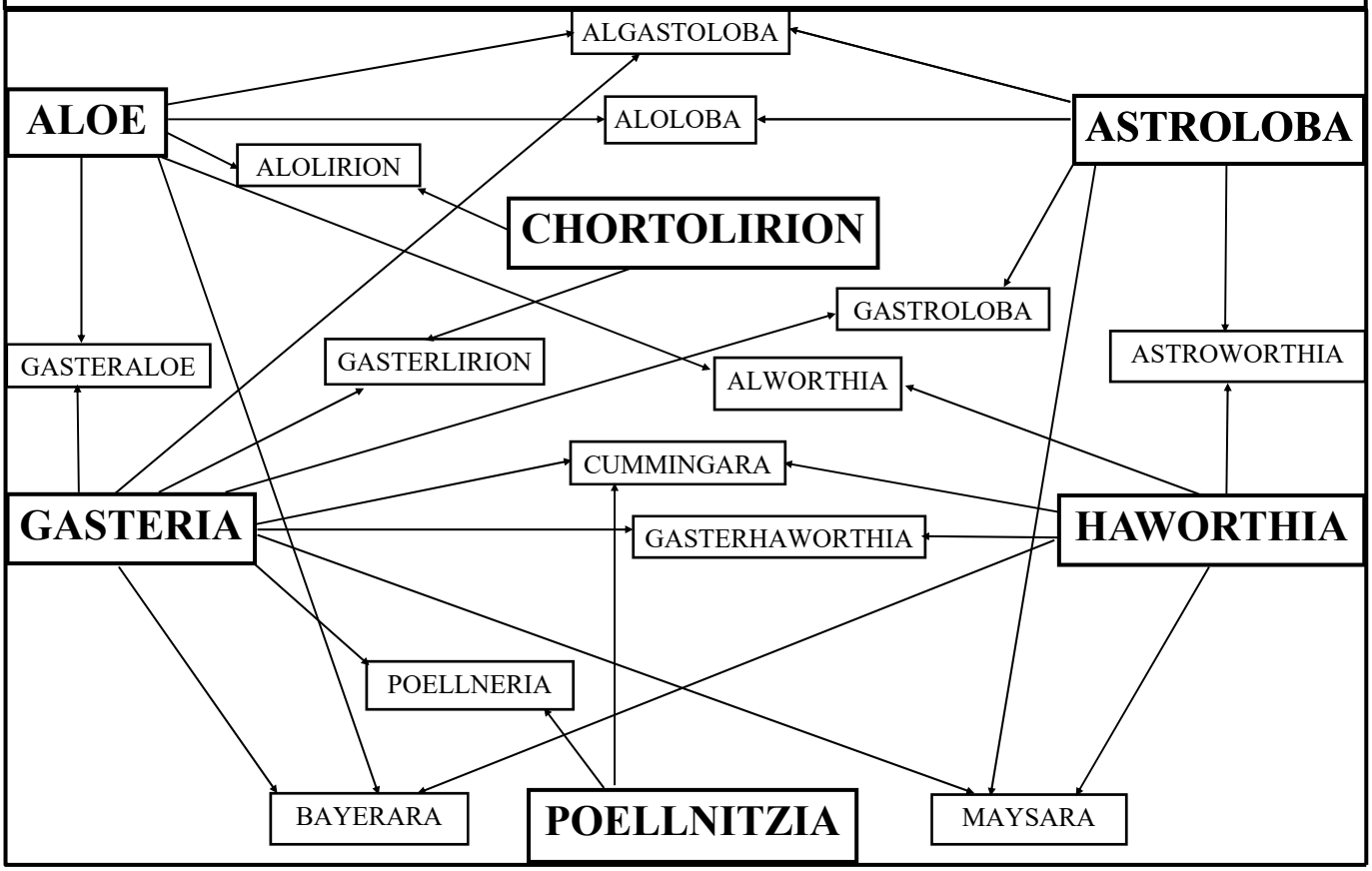
nothotaxon - preceded by "x". Nothotaxa may be created for genera, subgenera, species and subspecies, but Recommendation H.10A.1. of the ICBN states that authors should avoid combining parts of the names of the parents for species and subspecies names. However, non-compliance with a recommendation is NOT to be treated as making the name invalid. Fig. 2 lists the validly published names for intergeneric crosses of concern to this publication and figure 3 shows this information in flow form, both taken from Rowley, Alsterworthia International 6(2)8-11. As with a genus name, they are fixed for that category. The correct nothogenus name for the example above is ×Gasterhaworthia 'Rimail', which includes a cultivar epithet (see below). The exception is that a nothogenus name for a hybrid consisting of four or more genera must be formed from the name of a person with the addition -ara in order to avoid long names. This form may also be applied to tri-generic hybrids for the same reason e.g. ×Maysara Cumming (Astroloba x Gasteria x Haworthia). For further niceties for forming nothogenera names readers are advised to consult the ICBN.

Cultivars may be hybrids or species. A hybrid cultivar name is made up of the genus or nothogenus name plus the cultivar epithet e.g. ×Gasterhaworthia 'Limuk'. A species cultivar name is made up of the species name plus the cultivar epithet e.g. Aloe humilis 'Reach-for-the-Sky'. When a cultivar's parents are not known in full, that cultivar's name is made up of the genus plus the cultivar name e.g. Haworthia 'Whirlpool' (one parent Haworthia truncata, the other an unknown Haworthia).

Articles 3 & 20.1 of the ICNCP provide for the designation of cultivar groups for species within a genus or nothogenus on the basis of defined similarity (and also for lower taxonomic units). The nature of the similarity can be quite diverse and vary according to the required purposes of a particular initiator. They range from time of flowering (e.g. spring flowering), cultivation conditions (outdoor border plants), habit (creeping, climbing), one or more characters shared by a number of cultivars of known parentage, etc. The use of the Group category in succulent plants is rare, except in Japan. There cultivar creation is pursued methodically and a number of Haworthia cultivar-groups have been created e.g. Haworthia Galaxy Group, Haworthia Dali Group, Haworthia Shirotae Group. Each Group will embrace a number of species e.g. Haworthia (Galaxy Group) 'Daisetsu', Haworthia (Galaxy Group) 'Ivory', Haworthia (Galaxy Group) 'Mt. Blanc', Haworthia (Galaxy Group) 'Orion' etc. The Haworthia Galaxy Group is characterised by very large clones; very white, dense, large flecks; light-green, round leaves and thick brown stripes, i.e. all the species in the Group will have these features, but they will be distinguished from each other by each having additional features which will not be found in the other cultivars.

I hope readers will find this publication a useful reference for checking their plants and for avoiding creating duplicate names. Volume 2 will follow in due course. In the meantime do please let me have your suggestions and do please send in additional species names you have with, where possible, photographs and references to the original publications for the names.

Fig. 3. Gene Flow For Nothogenera.



Propagation & Cultivation.

Introduction.

Astrolobas, gasterias and haworthias (to be covered in volume 2) are native mainly to South Africa, with but a few from neighbouring countries. Aloes and bulbines have a much wider distribution including sub-tropical and tropical countries. The basic techniques for propagation and cultivation, including where to grow them, are well covered in a variety of books in different languages in different countries and will not be duplicated here. What follows concentrates on techniques appropriate to cultivars, though they are not always exclusive to them.

Objectives.

The objectives of propagating cultivars is to produce more plants with the desirable characteristics of the parents or to produce plants with new/improved characteristics. The methods used to propagate species and their sub-taxa are available for the propagation of cultivars, but they have to be used more selectively. It is normally only by vegetative propagation that the characteristics of a cultivar can be reproduced in the progeny. For qualifications read on!

1. Vegetative propagation.

Naturally occurring offset. Plants with apical dominance throughout their lives do not normally produce offsets. Those with apical dominance only in the early stages of their lives will produce offsets eventually. These can be removed from the parent plant and potted up to form independent plants.

The propensity of species to produce offsets naturally is variable, ranging from none to only a few rarely, through many more frequently to prolific. Where and how offsets are produced is also variable. They may be produced at the base of the main stem, or in the axils of leaves along the stem, with no or short stems to the offsets, or by dichotomous branching at the growing point, or at the ends of stolons, or on the stems of inflorescences. Observation will soon reveal into which category a cultivar falls.

To maximise the use of bench space, it is customary to cultivate a plant in a pot which is just a little larger in diameter than that of the plant. Figure 1, page 8, shows an un-potted variegated Haworthia limifolia which had been grown in a 3½" square pot! The stolons are thick and greyish-white. Only two had reached the surface to produce offsets. The others, some 12+, intertwined and repeatedly wound round the inside of the pot in search of a way to the surface. For plants which produce offsets at the end of long stolons, a pot several times the diameter of the plant will allow the quicker production of offsets. The pot surface area, being much large than that of the parent plant, provides greater opportunities for the stolons to emerge from the compost before they encounter obstructions, which cause them to circle. Even in the 254mm pan (10"), figure 2, page 8, to which the plant in figure 1 was transferred, some stolons were found to be "wasting time" running round the inside of the pot when the plant was un-potted for the removal of the rooted offsets. Larger trays have proved to be more productive for offset production for this cultivar and ones which produce offsets in a similar manner.

Another good reason for growing plants, which offset on long stolons, in larger pans is that there is room for the offsets to root and grow without disturbance. A well developed offset can then be removed by cutting the stolon. The offset can be potted up immediately in damp compost. The choice of where you cut the stolon is yours. When potting an offset for which the stolon has been cut at the base, the small cut surface should not be covered with compost, but left exposed to the air to dry and form a protective skin to prevent rot. To achieve this, it is usually sufficient to depress the compost next to the cut surface with a finger tip. When the protective skin has formed the exposed tissues can then be covered with compost. Alternatively, the runner can be cut several centimetres from the base of the offset so that it can be potted up with compost support all the way round the plant base. The cut end of the runner is exposed at the surface of the compost to dry some centimetres from the base of the plant.

Plants which produce stemless offsets generally do not require pots with a diameter much greater than that of the plant. Only a compact plant, offsets included, has to be accommodated, often with only one root system, that of the parent. In some species stemless offsets do put out roots whilst still attached to the parent, fig. 3, page 8. These should be accommodated in a pot somewhat larger than the rosette to allow the offsets' developing roots to reach the compost. Attempting to speed up the production of offsets by removing them when they are small is counter productive. Stemless offsets e.g. Haworthia cymbiformis fig. 6, page 8, are tight up against the main stem. Cutting a small offset from the parent plant at the base of the offset often results not in a small rosette suitable for rooting, but in a number of detached leaves. Even if a rosette is obtained, development of the offset, including the production of roots, my be slow or unsuccessful because of the small size of the rosette. It is far better to allow offsets to reach larger sizes, the larger the better, before cutting them from the parent plant, as there is then less likelihood of a rosette disintegrating and more likelihood that it will root quickly.

The cut surface of a rootless offset should be allowed to dry and form a skin to protect it against rot before the offset is set on compost for rooting. They can be rooted on a gritty compost, sand, inert material such as perlite etc. Different people use different rooting mediums (and composts) with success; not everyone succeeds with the same medium, partly because other conditions which affect the plants vary. See "Total growing conditions" below.

Though some species produce offsets readily, their variegated cultivars generally grow and produce offsets more slowly, because of the reduced amount of chlorophyll available for the production of sugars, essential for plant growth. Regrettably, offsets of variegated plants can be quite variable, ranging from all green, through variegation in various proportions, to offsets which totally lack the green chlorophyll. Figure 7, page 9, shows a variegated Haworthia cymbiformis producing only green and all coloured offsets, none with variegation. More reassuringly, all the offsets of Gasteria 'Old Man Silver' are variegated in figure 4, page 8. Figure 2, page 8, shows a variegated Haworthia limifolia producing 11 offsets, only three of which are producing longitudinal variegation similar to that of the parent plant. Six are totally green and three have green leaves when young, which change to yellow as they age. Variegated plants are wanted, not all green nor all coloured without chlorophyll. Though all green plants have been known to produce a variegated offset occasionally, such events are so rare as to make keeping the green offsets uneconomical for most people. They should normally be discarded at the earliest opportunity. All coloured offsets lacking chlorophyll cannot be grown on their own roots because, in the absence of chlorophyll, the essential sugars cannot be produced. These too are best discarded as early as possible. The number of variegated offsets left may be small! If any variegation is detected in offsets, those which show the required characteristics in an enhanced form should be preserved for future vegetative propagation and the others

(Continued on page 11)

Figs. 1 & 2. *Haworthia limifolia* variegated. ISI 94-30.

Fig. 3. “These should be accommodated in a pot somewhat larger than the rosette to allow the offsets’ developing roots to reach the compost ”.

Fig. 4. *Gasteria* ‘Old Man Silver’

Fig. 5. *Aloe* ‘Delaine’.

Fig. 6. *Haworthia cymbiformis* variegated. Offsets between leaves.

Fig. 7. *Haworthia cymbiformis* variegated. Half plant. Green and cream offsets . No variegated.

Fig. 8. *Aloe polyphylla.* Top cutting from a 5 year old plant.

Fig. 9. *Aloe polyphylla.* Offsets on basal portion 1 year after above top cutting was taken

Fig. 10. *Haworthia woolleyi* Vertical cut half stem with three damaged leaves attached (right side) producing two offsets.

Fig. 11. *Haworthia retusa* (*geraldii*). Vertical-cut half-stem with four offsets, not all visible.

(*Continued from page 8*)
should be discarded as inferior. In this way the desirable characteristics are improved upon. Non-variegated cultivars often produce quite uniform offsets, figure 5, page 8, Aloe 'Delaine'.

Facilitation of offset production. When plants do not or only rarely produce offsets, offset production can be encourage by decapitation and by using parts of the plant such as thick roots, leaves, stem pieces and inflorescences for propagation purposes.

Decapitation. By removing the top of a plant the influence of apical dominance is destroyed. This enables the suppressed buds lower down to develop and produce offsets. Many plants, particularly some haworthias and small and young aloes, are stemless, shallow rosettes. Removal of the growing point is probably best done by gouging out the centre top with a sharp knife. This ensures that a good sized basal portion is available for offset production. Attempts to use a horizontal cut to remove the top for rooting from a stemless, shallow rosette are often not successful. At best only a very shallow rosette will be obtained which may dry out before rooting and the basal portion may be too small with too few leaves to sustain itself. If the rosette is tall enough, the top may be removed by a horizontal cut a little distance below the growing point, so that a rosette ready for rooting is removed, fig. 7 page 9. As the objective is to remove the top so that the basal portion produces offsets, it is far better, if necessary, to sacrifice the top so that the basal portion is substantial. To obtain a reasonable top cutting for rooting at the expense of the basal portion is not a step in the right direction. Allow the cut surface of a top cutting to dry before placing it on compost for rooting. The basal portion will produce offsets in due course, fig. 8 page 9. Patience is required because some produce offsets more slowly than others. It is worth ensuring that the plant has rooted in new compost sometime before the decapitation, as this will ensure a good root run and avoid having to disturb it after its decapitation.

An alternative to decapitation by a horizontal cut is to divide the plant into parts by vertical cuts, but not all plants respond well to this method. The number of vertical cuts that can be made is determined by the diameter of the stem to which the leaves are attached, the greater the diameter the more vertical cuts can be made. Vertical cuts through the growing point destroy apical dominance. The objective is to obtain vertical sections of stem with some leaves and roots attached, which are sufficiently large for the cut section to be self supporting. One vertical cut down the stem and roots will give two portions, two cuts four and so on. The more substantial the vertical sections the more likely they will be to survive, grow and produce offsets. Therefore, limit the number of vertical cuts. One cut should, with care, give two substantial vertical sections; two cuts are possible but the risk of at least some failure is increased. Figures 10 and 11, page 9, show vertically-cut half-stems producing offsets. Because vertical sections have cut surfaces through the stem and roots, extra care has to be taken when potting them. They are best potted without delay in a damp compost to avoid drying out, but compost should be kept away from the cut surfaces until they have dried and formed protective skins.

Offsets from leaf cuttings. Detached leaves of some, but certainly not all, plants can produce offsets. On present evidence, Aloe leaves do not produce offsets, though some may produce roots only, but many haworthias and gasterias and their hybrids do produce offsets from leaves. For this method of offset production to have the best chance of success healthy, turgid leaves should be cut or pulled from the parent plant. The exposed surface should be allowed to dry in warm shade, not full sun, so that a protective skin is formed over the damaged tissues. The base of the leaf is then set on compost with the leaf leaning against the side of the pot for support or the base can be inserted in a finger depression in the compost to retain it in the vertical position, without being covered with compost at this stage. The depression will eventually fill with compost as the leaves are sprayed and later watered. At one extreme leaf rot can be a problem, at the other drying out of the leaf before offsets are produced. To avoid rot, pot the leaves in dry compost, but spray regularly to avoid the leaves drying out. The spray should dry within, say, 12 hours. Eventually the leaf cuttings will have to be watered and with care to avoid rot. Theoretically, watering is best commenced when offset production has just starting, but you are not likely to see the initial process as the offsets and their roots will be at the base of the leaf, which by now will be covered with compost. The length of time taken for the leaf to produce offsets varies with the species and the conditions in which propagation takes place. Six months to two years are good approximations. When offsets become visible allow them to grow to a good size, the larger the better, before separating them from the parent leaf for potting up individually. If the parent leaf is still in good condition (it may by now be shrivelling up) it may go on to produce more offsets, particularly if you leave one small offset attached. Figures 12 -14, page 11, show offset production by Haworthia leaves.

The following statement was made above: "to have the best chances of success, healthy and turgid leaves should be cut or pulled from the parent plant". In this connection it is perhaps worth mentioning that some people insist that leaves should be cut from the parent plant with some stem attached (presumably in order to include the axillary bud at the junction of the leaf and stem) and that portions of leaves cannot be used to produce offsets. These statements do not conform to reality - whole leaves without any stem tissue attached frequently produced offsets and portions of leaves have been used successfully to produced offsets on many occasions. Furthermore, people who advocate using leaves with some stem attached fail to explain exactly what they mean by "stem". In dicotyledons (cacti, euphorbias etc.) the vascular bundles of the leaves are attached at their bases to a ring of substantial vascular bundles running the length of the stem. The stem is made up of various tissues which are connected to give a solid stem to which the leaves are attached. With dicotyledons it is therefore a simple matter to cut a leaf with a wedge of stem attached, but not so with monocotyledons. They have a different structure. Aloes, gasterias, haworthias are all monocotyledons having the same structure. The base of each leaf is attached to a fine ring of stem tissue through which the vascular bundles run separately down to the roots. The circular tissues are therefore layered, the outer layers representing the older leaves and the inner the younger. This can be best illustrated with an Aloe, but remember that aloes cannot be propagated from leaf cuttings. Fig. 15 shows an Aloe fragilis rosette with the roots cut off and the three lowest leaves slid down off the stem. Fig. 16 show how the circular bases of the three leaves in fig. 15 interlock to form the stem with the lower, oldest, at the outside and the inner, youngest, at the centre. Fig. 17, page 13, shows two of the leaves from the top. The vascular bundles are the dark red lines which can be seen clearly in the leaf-bases and circular stem tissue. Attempts to cut a leaf from the stem with some stem tissue attached from a whole plant is likely to result in a leaf with a fragment of thin tissue which, because it is thin and non-succulent, will quickly dry out leaving only the succulent leaf.

In fig. 18 the same structure in Astroloba can be seen in two leaves with circular stem tissue at the bases. Fig. 19 has

(Continued on page 13)

Fig. 12. *Haworthia cooperi* x *H. maughanii.*
Offsets produced by one leaf still in good condition.

Fig. 13. *Haworthia* 'Hakuteijoh'
Offsets produced by one leaf still in good condition.

Figure 14. *Haworthia* 'Crocodile Rock'. ISI 97-74.
Offsets produced by two leaves which are now exhausted and dead.

Fig. 15. *Aloe fragilis* ISI. ISI 98-27.
Top cutting with three lowest leaves eased down to show the circular ring of tissue at the base of each leaf.

Fig. 16. *Aloe fragilis* ISI. 98-27.
The three leaves in fig. 15 show how the circular bases interlock to form the stem with the lower, oldest at the outside and the inner, youngest at the centre.

(*Continued from page 11*)
the stem longitudinal vascular tissues exposed by the removal of the leaves and surrounding stem tissue.

The structure of Haworthia is exactly the same. Fig. 20, page 13, shows one half of a column type Haworthia from Harvest Vale cut vertically. (It also demonstrated the principle of vertical sectioning for offset production, but it is NOT a good example of this method. Thin-stemmed, column haworthias are inclined to dry out and bend when cut vertically, because of the large exposed cut surface with only little stem thickness. Top cuttings are easily made and rooted leaving a good sized basal portion for offset production.) In this example the leaves are not so tightly packed as in rosette types but they still present the same problems for leaf removal with stem attached. Fig. 21 shows the lowest leaf removed with a piece of stem attached. The piece of stem may or may not remain attached to the leaf as the cut surface is allowed to dry and form a protective skin. During drying out, it is inevitable that the stem tissue dries out and dies. From fig. 20 it can be seen how difficult it would be to prise the leaves apart and make two small, inclined horizontal cuts to remove one leaf with some stem tissue attached without damaging the other leaves and stem. For a compact rosette plant the problems are even greater and if you were successful what would you have gained when leaves without stem tissue and parts of leaves can be used to produce offsets?

To remove a Haworthia leaf from a rosette it is only necessary to hold the rosette firmly in one hand and move a leaf from one side to the other several times with the other. If the lowest leaf is being taken it will usually break away at the base of the leaf where the circular tissue commences, because there is no leaf below to trap it. The lowest leaf may not, however, be the best to take. The lower leaves are the oldest and may not be the most turgid if they are in the first stages of decline or worse. The lower leaves die back as new ones are produced at the top. If a healthy, younger, turgid leaf is taken higher up the rosette, it will be trapped by the surrounding leaves, the more so the more turgid are the leaves and you want turgid leaves. They have good reserves for offset production. Moving a younger turgid leaf from side to side will generally result in it breaking off a little distance from the leaf base, which will be tightly held by the surrounding leaves. This does not matter. Portions of leaves have been used successfully for offset production by many people.

Offsets from roots. Detached roots of some plants, but certainly not all, can be used for vegetative propagation. No reports are known of Aloe roots being used successfully, but roots of some Haworthia species/cultivars have been. Fig. 22, page 14, shows a Haworthia truncata root producing one new plant and fig. 24, page 14, another Haworthia root producing two, one with a developing own root.

Detached roots may accidentally become available when re-potting or as a result of rot at the base of the plant. The broken/rotted end should be cut back to sound tissue. “Surplus” roots may also be cut from a plant when re-potting to provide propagation material. To prevent setback by drying, it is best to pot up roots immediately in a damp, gritty compost with the cut surface projecting about 1 cm above the surface, fig. 23, page 14. This helps to prevent rot by avoiding compost contact with the cut surface. Place them in a warm position, but not in full sun, and ensure the compost does not dry out. Aim to keep it just moist. If, perhaps because of accidents, you are using roots for propagation in winter, put them in a propagator at 15°C (60° F) or more, or bring them into the house and place them in the brightest possible place. Avoid low and high temperatures and dry and wet compost as these conditions prevent growth and encourage desiccation/rot. Patience is required. Depending on growing conditions and the species involved, some root cuttings may produce new plants in six months, others may take up to a year longer.

It is possible, though apparently uncommon, for roots of some species to produce offsets at broken tips. Figures 28 & 30, page 16, show a Haworthia truncata with two small offsets being produced at an incomplete break near the tip of the root where the lower portion is bent back onto the root. The tip of the root is missing. This root had grown outwards, then upwards when it hit the side of the pot. On re-potting gentle pressure was applied to bend the root down and cover it with compost. As these roots are thick and quite rigid, the end was almost completely severed during this process. The tip was either lost at the same time or rotted later. The beneficial result was the production of two offsets at the incomplete break in the root.

There is no list of plants with roots which will produce plants from root cuttings. Long, thick roots are likely to give the best results, but shorter, less thick roots may also give results. Success is unlikely with thin roots. They die because they have few reserves compared with thick roots. Furthermore, in some genera, such as Aloe, roots of any species seem incapable of generating new offsets whatever their size. The thick roots of hybrids of any combination of Gasteria and Haworthia can be used for propagation purposes, but results may be variable and slow in some cases. Nevertheless, it is worth potting up any “surplus” roots you have to see what can be achieved.

Offsets from inflorescences. Of the various methods of vegetative propagation, that of producing offsets from inflorescences is the one that is used the least. Empirical evidence suggests that the spontaneous production of inflorescence offsets is not common and there are few if any reliable reports of artificial encouragement. The axils of bracts on the stems of inflorescences of some plants can produce offsets without any surgical stimulant. Fig. 26 page 14 shows Haworthia ‘Crocodile Rock’ producing two offsets from two inflorescences, fig. 27 page 16, a Gasteria which initially produced one (large) offset and then several round its base and fig. 25, page 14 Aloe ‘Quick Silver’ commencing to produce one offset from a stem bract axil. Offsets have been seen on flimsy inflorescences as well as stout ones. For example, offsets have appeared on the flimsy inflorescences of Haworthia cymbiformis. As seed cannot usually be used for propagating our cultivars (see below), for non-offsetting/rarely-offsetting plants attempts to promote offset production on an inflorescence by decapitating the inflorescence can be tried. This removes the growing tip and stimulates the production of growth from below, but the new side growth may well take the form of flower shoots, not offsets. Decapitation at different stages of the development of inflorescences can be tried to determine which, if any, will be the most successful for the production of offsets. At one extreme, the decapitation of a young inflorescence may result only in the production of flowering side shoots, whereas at the other extreme the decapitation of an old inflorescence, where the lower flowers have died back, may result in (limited) offset production. Decapitation at intermediate stages is another possibility. There is room for experimentation and reporting!

Offsets by tissue culture. This is a specialised technique which involves culturing cells from various parts of a plant (roots, leaves, inflorescence segments etc) on agar and then promoting, by applying hormones, differentiation of the multiplying cells to form tiny plants. Tissue culture is best performed under clinical conditions and a thorough knowledge of the various hormones and proportion to use is required. The method is hardly used amongst hobbyists though one or two in various countries have been successful. When successful, large quantities of plants can be produced from a small number of starter cells. Anyone seriously

(Continued on page 16)

Fig. 17. *Aloe fragilis* ISI. 98-27.
Two leaves in fig. 15 from the top to show the circular bases. The dark red lines are stem longitudinal vascular bundles.

Fig. 18. *Astroloba*
The leaves with circular stem tissue are the same as in *Aloe.*

Fig. 19. *Astroloba*
Stem vascular bindles after the removal of leaves and surrounding tissue.

Fig. 20. *Haworthia*
Half vertical section to show leaf and stem arrangement. The stem longitudinal vascular bundles are the random whitish lines.

Fig. 21. *Haworthia*
Lowest leaf removed with part of the stem attached. The whitish lines in the stem piece are vascular bundles. On drying out this piece fell away from the leaf.

Fig. 22 *Haworthia truncata.*
Root cutting producing one offset.

Fig. 23. *Haworthia truncata.*
Root cutting as potted with cut surface just above the compost.

Fig. 24. *Haworthia*
Root cutting producing two offsets, one with own root.

Fig. 25. *Aloe* 'Quick Silver'
Commencement of offset production in axil of bracts on inflorescence stems.

Fig. 26. *Haworthia* 'Crocodile Rock'. ISI 97-74.
Two offsets one on each of two inflorescence stems.

(*Continued from page 13*)
interested in starting to propagate by tissue culture should seek advice from a specialist such as an agricultural/ horticultural college.

2. Propagation by seed.

Because a cultivar is usually one clone, it cannot normally be propagated from seed. Seed has a variable genetic mix differing from that of the seed producing plant, consequently the progeny may differ in varying degrees from the parent. Only vegetative propagation from selected plants will retain the desired characteristics of the parent.

However, if a line of pure breeding cultivars has been developed by selection for crossing very similar plants from successive generations (a time consuming process) the seed can be used for the propagation of the cultivar. This is quite uncommon for the species covered by this publication.

Though cultivars are usually clones they do not have to be so. Article 2.17. of the International Code of Nomenclature for Cultivated Plants states that "In considering whether two or more plants belong to the same or different cultivars, their origins are irrelevant. Cultivars that cannot be distinguished from others by any of the means currently adopted for cultivar determination in the group concerned are treated as one cultivar". A cultivar may therefore contain plants which look the same but which have been produced more than once, in some cases with different parental stock. Some of these cultivars may produce progeny from seed by crossing, which retain the parental characteristics. For example, ISI 94 -29 and ISI 94-30 are two different clones of the yellow variegated Haworthia limifolia. ISI 94-29 is of origin unknown (U.S.A.?), ISI 94-30 originated in Japan. The former is said to be slightly larger with more elongated, usually lanceolate leaves, the latter with shorter, usually ovate leaves. These features have been proved to be somewhat variable in both clones. Furthermore leaf length and shape can be influenced by the conditions under which the plants are grown. It is frequently impossible/difficult to tell the clones apart without labels. They are one cultivar. The seed from crossing these two clones has produced yellow variegated plants in a range similar to that of parental offsets.

3. Cultivation.

This section deals with the main factors influencing the cultivation of cultivars, which are under the control of the grower, not with where you can grow them, which is dependent on where you live and the prevailing (variable) climatic conditions.

At meetings, on the internet, in correspondence and in journals, "discussions" about composts are prominent, often heated and often conflicting. Not only are there conflicts at a point in time, but over time. Fashion often predominates, only to change with time. All too often discussion centres around one component of a compost, sand, peat, coir, volcanic rock, aggregates of various types etc with some favouring one whilst others dispute its value. Most, but not all, fail to discuss cultivation in terms of total growing conditions. If the basic requirements of plants are known (they can be found in any simple text book on botany and in many cheap books on cultivation) it only remains for the hobbyist to apply them intelligently, learning what is best for his/her conditions as he/she observes the progress of the plants over the years.

Total Growing Conditions. The fact is that different people grow plants successfully under different conditions and in different ways. This is because each has got the balance right to suit his conditions, which vary not only from country to country, but also from place to place, not only geographically, but also within a glasshouse where conditions can vary quite considerably from the north end to the south end and from the base to the roof. You can prove this quite easily by placing maximum and minimum thermometers at the north and south ends of your glass house and on the floor, on the staging and in the roof space where you may have suspended shelving and/or hanging baskets. At the same times each day, for a few days, record the temperature for each thermometer and then compare the results. If you want to go one stage further you can do the same with humidity gauges. You should find that there is quite a variation between the north and south ends of the glasshouse and between floor and roof levels. Plants require a suitably nutritious compost avoiding extremes of pH, air around the roots, air movement around the plant, water and heat and a resting period when water is rarely given, but air movement is important.

Composts should be porous so that air can permeate the spaces between the ingredients and surplus water can drain away quickly. It should also retain moisture, but without being saturated, so that the air spaces are not blocked, as this inhibits the entry of air. Roots take in oxygen from the air in the spaces between the compost particles as oxygen does not diffuse readily down to roots from the top growth where it is produced. What types of ingredients are used to achieve these objectives are, within broad limits, of little importance. What is important is that the objectives should be achieved. Many ingredients can be used for compost making with different ones being available in different countries. Materials include native earth in semi-arid areas, volcanic rock, perlite, grit, course sand, broken brick etc; peat, coir, composted vegetation, leaf mould, rice husks etc. Coarse material is preferable to fine as fine tends to clog up the air spaces. Balanced fertilisers (NPK 20:20:20 Nitrogen-phosphorus-potassium) and trace elements are readily available in many countries to add to compost and water at half strength.

Water is an essential requirement for plant growth. It is required in the growing season, which may be different for different plants. Advice about watering at fixed intervals is false as is advice about giving fixed quantities of water. The watering regime in a location with successive sunny days interspersed with only occasional showers will be different from that for the same plants in a location with a lot of dull, rainy days interspersed with sunny periods. Temperature will also be an important factor because uniform day temperatures over successive days will dry out compost much more quickly than variable day to day temperatures. Plants should be watered in the growing season each time the compost is almost dry. The amount of water to be given is determined by a variety of factors. If high temperatures prevail, the compost should be completely wetted but not saturated. Ensure that entry of air is not blocked by water filling the air spaces. If the weather is more variable, resulting in some cold days when evaporation is low, give less water so that the compost is, say, just damp as it will then dry out in reasonable time in the lower temperatures. The nature of the compost should be taken into account. Peat does not wet readily if dry without a wetting agent, so do not let it dry out before each watering in the growing season. Coir wets readily so less water may be needed to wet it than for the same quantity of peat. A balanced fertilizer can be added to the water from time to time when the plant has been in the pot for a growing season, by which time the available nutrients may have been used up/washed out. The frequency of adding fertilizer is dependent on the rate of growth of the plants and the rate at which you water. The more frequently and the more voluminous the application of water, the quicker the nutrients will be washes out! Fast growing plants such as some aloes will require more frequent watering and fertilizing than slow growing

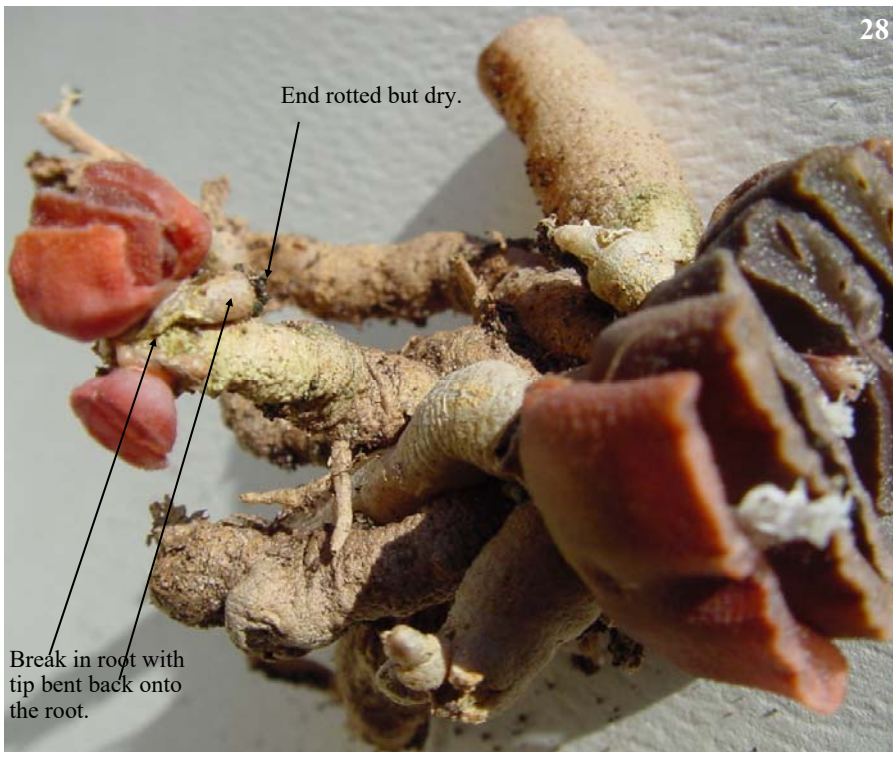


Fig. 27. *Gasteria* variegated with offsets on flower stalk

Figs. 28 & 30. *Haworthia truncata* producing offsets at break in root.

Fig. 29. *Haworthia* with roots forming at base of lower leaves.

Fig. 31. *H. translucens* (*gracilis*) *ssp. tenera* 'Anemone' with dead stem and roots at the stem base, new roots at base of rosette.

haworthias. Another factor influencing when to water and how much to give is the pot itself. Plastic pots and some glazed, decorative pots retain water a long time, much longer than porous pots such as clay and some decorated pots. The former will require less frequent watering than the latter, the periodicity depending on other factors such as temperature, plant growth and evaporation. Plants grown in glazed pots without drainage holes in the base need very controlled watering, as water use and drying out of the compost is totally dependent on plant water uptake and pot surface evaporation, which may be very low.

PH measures the acidity and alkalinity of water. In practice most plants will grow quite happily in a compost round about or just under 7, which is neutral for acidity-alkalinity. Below 7 the compost is becoming acid, above it alkaline. With frequent watering with tap water, which itself will normally be alkaline, and the regular use of fertilizer, compost can become too alkaline. This can results in poor growth, leaf discolouration and possibly to some additional root loss, which adds to the problem. The solution is to use rain water (slightly acid) and to repot in fresh compost.

Pots & roots. Plants can be grown successfully in a variety of containers ranging from plastic, terracotta, glazed and unglazed pots, glass and wood with or without holes in the base; tall or short; wide or narrow and so on. The choice is yours, but remember total growing conditions must be taken into account!

The size of the plant itself will initially determine the size of pot, but see page 7 for offset production by stolons. The pot should have a diameter somewhat larger than the diameter of the plant to allow for growth, the exact diameter depending on the rate at which the plant grows. A larger, surplus diameter should be allowed for a faster growing plant than for a slower grower. The nature of the roots will determine the depth of the pot. Only a half pot may be required for plants with short fibrous roots, but a full pot, or even a long tom (a pot with extra depth relative to the diameter) for plants with stout, long roots. If a plant has lost its roots, it may be re-rooted in a shallow pot or several in a shallow tray. A shallow container with a wide surface area is less likely to remain wet for a long period and cause rot in rootless plants.

It is common for the lowest leaves of rosette plants to die back and for new growth to be produced at the apex. It is also common for roots to die back and be replaced by new roots, particularly in haworthias. All this dead plant material should be removed, particularly when repotting, as this helps to avoid rot. Figs. 29 & 31 show H. attenuata variegated & H. translucens (gracilis) ssp. tenera 'Anemone' with new roots emerging from the base of the rosettes. In fig. 31 the underground stem is shown with lower, older roots missing or dying.

Growth at the rosette growing point is initially followed by spreading outwards and down. As old leaves at the bottom die back stems increase in length, but this may hardly be noticeable in many species and not at all in those which have contractile roots. New roots are produced at the base of the rosette to link the plant with the compost as old roots die and release their hold. It is quite common for the base of the stem to which old roots were attached to also die back. This should be cut back to live tissue and any cut surface left to form a protective skin before the plant is potted up. The length of the stem below the rosette in figure 31 is by no mean unusual for some species, but in many it will be much shorter.

An inspirational side comment. Black pots are commonly, but not exclusively, used in the horticultural trade and by amateurs for both glasshouse plants and outdoor plant which have to be transported. Plants may initially grow well in these pots, but a time may soon come when root binding develops. The roots spiral round and round, intertwining as they grow and losing flexibility as they age. If repotted/ planted out in this state the roots hardly or only very slowly branch out into the surrounding compost/soil. Flexible roots may be eased out before repotting into the new compost to encourage outward growth, but the less flexible may well break off (see root propagation above). Can a way be found, other than very frequent repotting, to stop roots binding?

In Australia trees grown in black containers were found to suffered badly from root heat scorch. Black absorbs heat, but white radiates it, so experiments were carried out with white pots. The results were that the scorching stopped and, in addition, it was found that the roots did not spiral and bind. When they reached the sides of the pots they grew down. When they were planted out they established quickly with the roots growing into the surrounding ground (The Plantsman Vol. 1 Part 1 March 2002). Notwithstanding this success the use of white pots has not seen any rapid development. Would the use of white pots stop root binding in aloes, gasterias, haworthias etc? No reliable evidence on which to answer this question seems to be available. There is room for experimentation.

Air. The importance of having an open compost to allow air to penetrate so that roots can take in oxygen for bio-chemical processes has already been stressed. Ignoring such phenomena as strong winds etc, which may cause physical damage to plants not only outdoors, but also in the glasshouse by overturning taller, potted plants such as aloes and blowing smaller plants such as haworthias off shelves, air movement is beneficial. Air movement around plants helps to move hot, stagnant air with consequential cooling. This may facilitate the penetration of fresh air into the compost, reduce pot temperature and reduce the difference between the inner and outer leaf temperatures and the plant's need to produce red pigments to protect itself from excessive heat. Within limits, it may also allow the plant to grow slowly rather than go into heat dormancy. Air movement may also reduce problems with pests and diseases which thrive in stagnant air. This can be important in cold, damp winters when condensation on plants can be a problem, particularly if a form of heating which gives off water (gas, oil) is used without ducting of waste gases to outside the glasshouse.

Plants exchange gases through the pores on their leaves expelling oxygen, a by-product of biochemical processes within the plant, and taking in carbon dioxide, a prerequisite for essential biochemical processes. Generally, to prevent water loss in succulents the pores are open only when conditions are favourable so as to prevent damaging water loss through the pores. When the pores are open the exchange of gasses is facilitated by air movement removing stagnant air surrounding the plant. The movement of gases between plant and air is dependent on gas gradients. Air movement over the plant increases the carbon dioxide concentration in the air around the plant and decreases the oxygen concentration facilitating the movement of carbon dioxide into and oxygen out of the plant.

Opening vents and if necessary doors will promote air movement in the glasshouse, but in very hot weather vents may not be adequate and fans may also have to be used to bring about noticeable air movement throughout the glass-house. Often too little ventilation is given to glasshouses from spring to autumn.

In winter air movement is particularly desirable to remove condensation from around the plants and to facilitate gas exchange for winter growing plants. Cold, outside air

may prevent the use of vents. Fans are then the sole means of circulating air. Fans only circulate the air. To remove moisture from the air, particularly when a form of heating is used which gives off water within the glasshouse, a portable dehumidifier can be installed. It should be one which will continue to remove moisture at a low temperatures. Those designed for home use are usually unsuitable as they may not operate at temperature below 10°C. Those designed for use in outhouses operate at lower temperatures and may be suitable for glasshouse use.

Summary.

Correct cultivation methods have to be learned from experience by applying the basic principles of plant culture to the plants grown in your circumstances, which may be different not only from those of other peoples, but for different parts of the glasshouse. Total growing conditions are important. The size and type of pots, the nature of the compost, the rate of growth of the plants, the nature of the weather, air movement, size of the glasshouse, location in the glasshouse etc all affect plant growth and health and they are interdependent. In the same conditions, faster growing plants will need more frequent watering than slower growing plants and smaller pots will need more frequent watering than larger. Plants in the south end of a glasshouse (northern hemisphere) will dry out more quickly than plants in the north, particularly in large glasshouses, and so on. A “deficiency” in one area can be compensated for by adjustment in another. In hot days provide shade and more frequent watering; in cool days do the opposite. If the compost is not as porous as you might wish, give less water at each watering so as not to block limited compost air spaces and water more frequently if necessary to maintain a damp compost until you can provide a better draining compost. Move plants which are naturally dormant in summer to a cooler, shady place in the glasshouse and plants which grow in the summer to warmer places. Whilst most will be content with a minimum winter temperature of 5º centigrade plants from countries with warm winters will require at least 10º centigrade or more. Plants which turn deep red in summer may look attractive to some people, but they may be suffering from heat stress. Provide shade or greater air movement or both. Alternatively, they may be under stress because they have lost their roots. Clean them up, repot, place in a warm, shady place, spray and then water with care. Success will be achieved by monitoring and observing plants regularly.

It is now all up to you!

Aloe Cultivars.

***Aloe arborescens* Miller** is found from southern South Africa to Malawi and Zimbabwe and from the coast to high mountains. It is variable. Nine variants have been selected by the Kitstenbosch National Botanical Gardens, South Africa for cultivar status and named after a curator or director of the Gardens, which was established in 1913. The cultivars were described in Veld & Flora June 2002:63-65. Propagation for all is by offsets.

***Aloe arborescens* 'Pearson' van Jaarsveld**
Figs. 1a, 1b.

Description. Dense rounded crown with distinguishing, graceful, somewhat drooping leaves and salmon-pink flowers. Flowers SA winter.

***Aloe arborescens* 'Compton' van Jaarsveld**
Figs. 2a, 2b.

Description. Rounded shrub about 1.5m tall, yellow-green leaves in small rosettes. Prolific, continuously forming small plantlets along its stems. Flowers SA winter, dark red.

***Aloe arborescens* 'Rycroft' van Jaarsveld**
Figs. 3a, 3b.

Description. Large open rosettes. Leaves grey-green. Flowers SA winter, bright red. One of the fastest growing aloes available. Said to be the most striking of the *arborescent* cultivars.

***Aloe arborescens* 'Huntley' van Jarsveld**
Figs. 4a, 4b.

Description. Prolific. Many side branches. Leaves light yellow-green. Flowers orange. Unlike the other cultivars it flowers in SA summer, only sporadically at other times.

***Aloe arborescens* 'Mathews' van Jaarsveld**
Figs. 5a, 5b.

Description. A rounded, large shrub with dark, blue-green leaves. Flowers dull, dark red. Flowering reaches a peak in South Africa in April.

***Aloe arborescens* 'Jack Marais' van Jaarsveld**
Figs. 6a, 6b.

Description. Rosettes with more or less erect, somewhat twisting, blue-green leaves. Densely flowered. Flowers orange-red reaching a peak from May to June in SA.

***Aloe arborescens* 'Philp le Roux' van Jaarsveld**
Figs. 7a,7b.

Comments. Tall plants. Rosette form similar to *Aloe arborescens* 'Compton' but in 'Philip le Roux' the leaves are yellow-green and the flowers are bright yellow. Flowers are at their best in SA towards the end of June.

***Aloe arborescens* 'Eloff' van Jaarsveld**
Figs. 8a,8b.

Comments. Young leaves upright, tips recurved, bluish-green. Plants not as prolific as the orange flowered 'Huntley'. The dull lemon-yellow flowers of 'Eloff' are unique in *Aloe arborescence.*

***Aloe arborescence* 'John Winter' van Jaarsveld**
Figs. 9a,9b.

Comments. Leaves greyish-green. The cultivar is distinguished by its tall, slender, erect, dark orange flowering spikes that tower above small rosettes. Flowers at their best in SA at the end of June.


10

Aloe arborescens Mill. 'Gold Rush' J. Trager

Description. CSJ USA 67(2)

Parentage. A variegated form of the species of horticultural origin.

Comments. The longitudinal light green and yellow variegation is variable in width. Fig. 10. With age the yellow may turn to white. Of easy cultivation. Offsets are produced regularly, but many may be completely green or totally lack chlorophyll. The green are best removed to promote the variegated. Some offsets may be mainly yellow with traces of scattered green at the base of the leaves. This cultivar was distributed by the ISI as ISI 95-17.

Propagation. Offsets which can be stimulated by beheading.

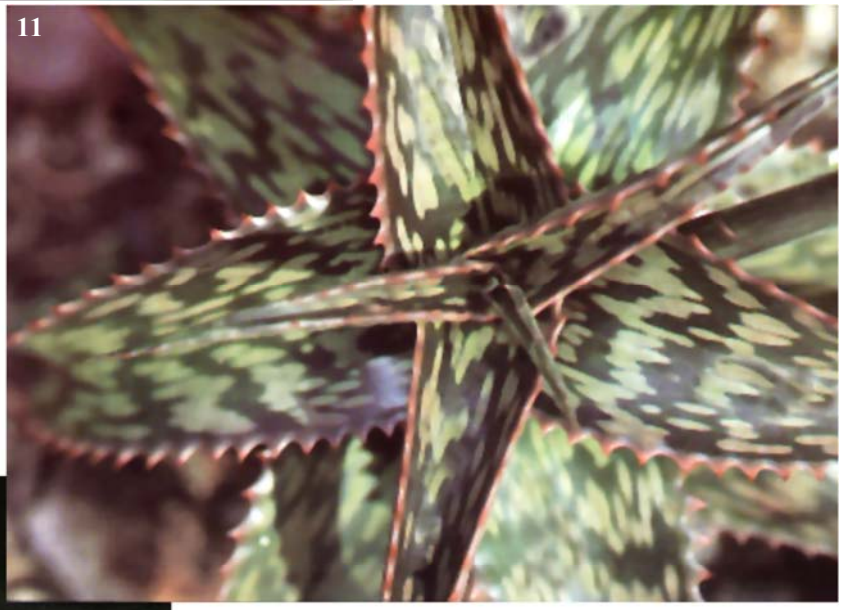
Aloe 'Bill Morris' P.I. Forster

Description. Haworthiad 13(4)128.

Parentage. [*Aloe jucunda* x *Aloe bakeri*) x *Aloe somaliensis*]

Comments. Non-offsetting rosette, leaves spreading, strongly recurved, glossy dark green with many scattered to coalescing, whitish spots 7-25mm long and up to 3 mm wide, becoming pinkish in strong light. Leaf margins with narrow cream-pink edges and cream-pink teeth to 4mm long. Fig. 11. Flowers pale pink at the base, apex white margins and pale-pink, mid-stripe. Hybridist W. Morris.

Propagation. Decapitation to produce offsets.


11


12a

Aloe 'Blimey Limey' J. Trager

Description. C&SJ USA 75(2)71

Parentage. ([*A. descoingsii* × *A. calcairophila*] × *A. bakeri*) × *A. bakeri* × (*A. bakeri* × [*A. albiflora* × *A. bellatula*]).

Comments. A Bleck hybrid. Dark-green, lance-linear leaves with white flecking and marginal teeth. Offsets freely. Figs. 12a-b. The name alludes to the uncommon lemony flower colour and is derived from British slang: *blimey* is used to express surprise or amazement and *limey* is short for *lime-juicers*, the term for British sailors, who were once required by law to drink lime juice to ward off scurvy.


12b

Distributed as ISI 2003-14.

Propagation. Offsets.

Aloe 'Bountiful' G. D. Rowley

Description. Ashingtonia 1:67-68 May 1974 as ×*Allauminia* 'Bountiful' basionym.

Parentage. *Aloe thompsoniae* Groen. x *Aloe albiflora* Bertr.

Comments. More vigorous and more hardy than the parents. Survives the cold greenhouse. Both parents have white spotted linear leaves. As a result of hybrid vigour, this cultivar's leaves are up to 23cm long otherwise they are similar to the parents. Clumps feely. The flowers are intermediate between the parents' and more numerous. In shape they are somewhat narrower than those of *Aloe albiflora* and each tepal is orangey-pink for the lower half, white above, with a dusky mid-stripe. Vivid orange anthers are slightly exerted. The flowers form short conical racemes. Fig. 13.

Propagation. Offsets.


13


14

Aloe camperi Schweinfurth 'Cornuta' J. Trager

Description. C&SJ USA 75(2)71.

Parentage. A selection from the species.

Comments. More robust form, thick, succulent more or less straight leaves (species slender, gracefully arching leaves), more generously spotted than in most forms. Fig. 15. Berger described *Aloe eru* v. *cornuta,* which Reynolds considers a synonym of *A. camperi.* As this cultivar matches Berger's description, Cornuta is the cultivar name.

Propagation. Offsets.

Aloe 'Brass Hat' J. Trager

Description. C&SJ USA 73(2)91.

Parentage. (*A. haworthioides* x *A. bakeri*) x ([*A. descoingsii* x *A. calcairophylla*] x *A. bakeri*)

Comments. Rosettes small. Leaves dark, bronzy-green, margins with many small but prominent teeth. Fig. 14. Leaf colour is influenced by growing conditions - the more stressful (less water, more heat) the deeper the colour and vice versa. Flowers yellowish-orange. Distributed as ISI 2001-17.

Propagation. Offsets, slower to propagate than many of the other Bleck hybrids. Removing the growing point will facilitate offset production.


15

Aloe 'Dainty'

Description. Not traced.

Parentage. *Aloe descoingsii* x *A. haworthioides.*

Comments. Leaves elongated triangular, blackish with impressive marginal teeth, concave with thin, leaf-edges distinctly recurved. Fig. 16. This feature is more pronounced when the plant is dry, less when turgid. See also *Aloe* 'Green Shark', page 29.

Propagation. Offsets.

***Aloe* 'Delaine' D.M. Cumming**

Description. Haworthiad 14(2)58.

Parentage. Unknown.

Comments. Freely offsetting. Dark green, narrow, slightly twisted leaves with white spots and teeth on leaf surfaces. Margins with white teeth. Fig. 17.

Propagation. Offsets.

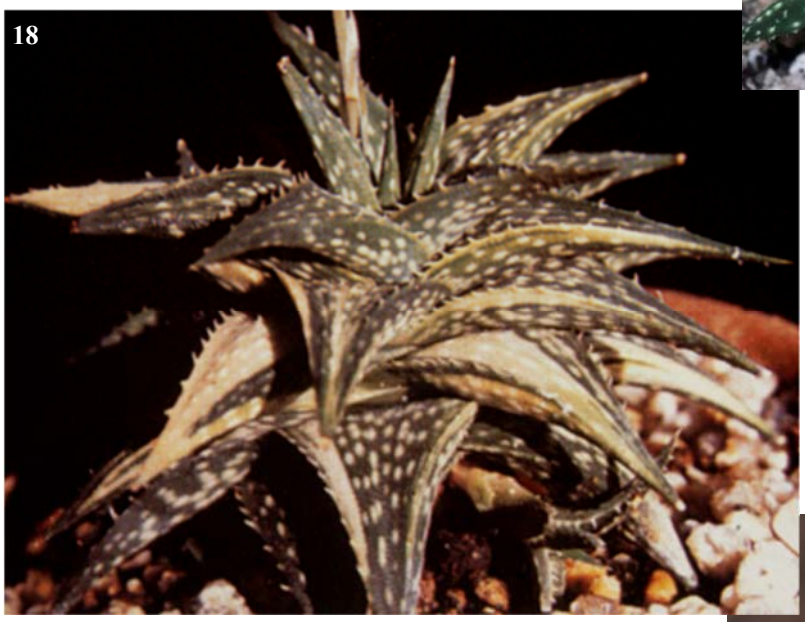
***Aloe descoingsii* Reynolds 'Kobito Nishiki'**

Description. The location of the original description is not known. The cultivar has been around for many years.

Parentage. A yellow variegated form of the species.

Comments. The yellow is in broad-to-narrow longitudinal stripes mainly at the edges of the leaves. Fig. 18. There are yellow spots and ovals on both leaf surfaces. Kobito Nishiki translates as Pygmy Brocade.

Propagation. Offsets.



***Aloe descoingsii* Reynolds (Variegated cultivar).**

Description. Where this cultivar was first published is not known.

Parentage. A variegated form of *Aloe descoingsii* which, as far as is known, occurred spontaneously.

Comments. This cultivar has the form of the species. Yellow variegation starts from the leaf edges on the young leaves, which also have yellowish spots on green. The variegation gradually creeps towards the centre of the leaves as they age, eventually to diffuse the entire leaf. The variegation is on both surfaces. Fig. 19. This cultivar is not common, as it is slow to offset.

Propagation. Offsets.


20

***Aloe dewetii* Reynolds 'Saijo' Yoshimichi Hirose**

Description. Variegated Plants in Color, page 36 is the first traced description to date.

Parentage. Presumably natural variegation in the species.

Comments. Form as for the species but with longitudinal white stripes of varying width and scattered white spots. Fig. 20. Saijo translates as "An intelligent woman".

Propagation. Offsets and beheading to promote offset formation.


21

***Aloe distans* Hayworth (Variegated).**

Description. Recorded as *Aloe distans* 'Variegata' (invalid Art. 19.13 ICNCP) in Variegated Plants in Color, page 36.

Parentage. Presumably natural variegation in the species.

Comments. Form sprawling as for the species with longitudinal, white variegation. Fig. 21. Quite rare.

Propagation. Offsets and beheading to promote offset formation.


22

***Aloe* 'Doran Black' C.B. (Dick) Wright ex H. Mays & J. Trager**

Description. Alsterworthia International 4(2)4.

Parentage. *Aloe juvena* x an unknown pollen donor.

Comments. *Aloe* 'Doran Black' is an irresistible beauty. Dark green leaves with many, intermittent, narrow, more -or-less raised blocks of white tissue, some with pronounced, central projections in the form of ridges; leaf-margins cartilaginous, white, teeth mainly with jagged apices, few with single points. Rosette about 12 cm in diameter, leaves 7 cm long and 3 cm wide. Offsets freely produced. Overall it looks like a miniature, zebra-plant sculpture - really, a living artwork! Fig. 26. The name 'Doran Black' is in honour of Doran Black. (NOT Dorian Black.)

Propagation. Offsets.

Aloe 'Durian Flake'

Description. Not traced. Japanese.

Parentage. *Aloe* 'Doran Black' x *Aloe* 'Super Snow Flake'.

Comments. Light green leaves with many intermittent, narrow, low blocks of white tissue some in the form of low tubercles. Margins cartilaginous, white, with jagged apices. They have a tendency to turn brownish with age. Fig. 23.

Propagation. Offsets.


23

Aloe 'Twingy'

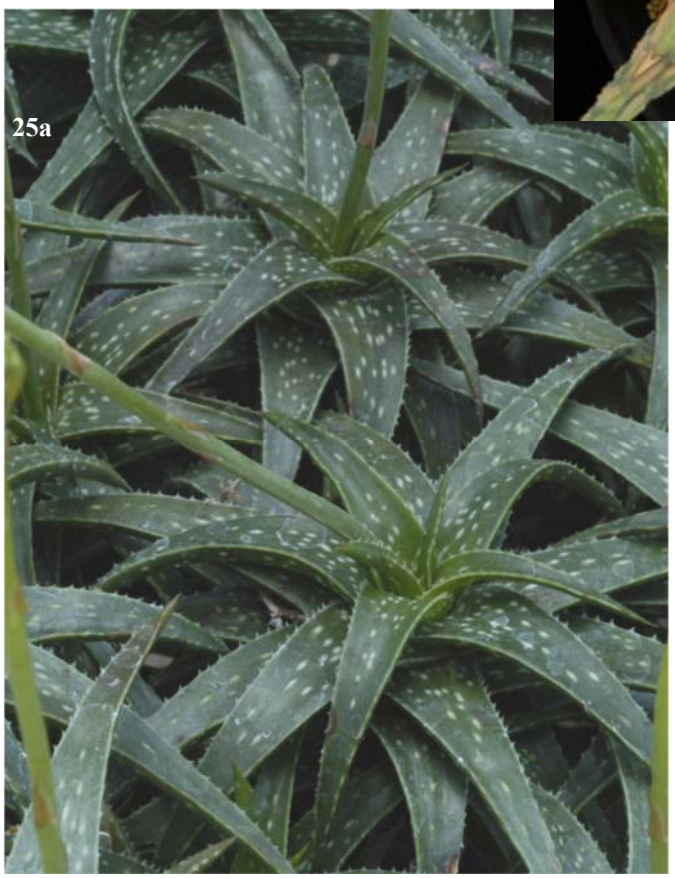
Description. Not traced. Japanese.

Parentage. *Aloe* 'Doran Black' x *Aloe* 'Super Snow Flake'

Comments. Leaves medium green with many intermittent, narrow, low blocks of greenish white tissues. Margins cartilaginous, pale brownish white, with jagged apices. Fig. 24. Overall this cultivar is much less brilliant in colour than 'Doran Black' and 'Durian Flake'.

Propagation. Offsets.


24


25a

Aloe 'Firebird' Trager.

Description. C&SJ USA 80(2) 55.

Parentage. *A. descoingsii* x *A. thompsoniae*.

Comments. Shannon Lyons created *A.* 'Firebird', but in three decades only few plants found their way into cultivation. It was not named until March-April 2008 when the ISI distributed the plants under number ISI 2008-7,

Its leaves look like a slender-leaved version of the Bleck hybrid *A*loe 'Cha Cha', but 'Firebird' produces conical racemes of narrow, urceolate, bright, red-orange flowers almost unceasingly. It also offsets freely. Figs. 25a-b.

Propagation. Offsets.


25b

Aloe 'Dappled Green' S. Gildenhuys.

Description. Alsterworthia International 9(2)22.

Parentage. *Aloe striata* x *Aloe variegata.*

Description. Leaves rosulate, acuminate, mid green dappled with whitish spots. Rosette diameter 27cm. Leaf width 7cm. The leaves of this cultivar lack the striations of *Aloe striata*, are more rigid and with a rosette in a spiral of three rows (but not as prominent as the spiral of *Aloe* 'Twister'), the influence of *Aloe variegata*. Plants are now five years old. So far no flowers have been produced.

Propagation. Offsets. If reluctant behead to promote offset production.


26

Aloe 'David Verity' J. Trager

Description. Dry Climate Gardening with Succulents, 1995.

Parentage. Uncertain, but includes what was presumed to be a sparsely branching *A. arborscens* hybrid with red buds and chrome yellow flowers and *A.* ×*principis*, natural hybrid between *A. arborscens* and *A. ferox.*

Comments. Forms an *A. arborescens*-like shrub to 5' (152.5 cm) or so, but with showy, branched, bicoloured inflorescences. The spirally arranged flower buds are at first red then become pastel butter-yellow. As they mature the flowers open to expose the long-exerted, orange stamens that add yet another swirl of colour. Figs 27a & b. 'David Verity' is a retired UCLA Mildred E. Mathias Botanical Garden horticulturist. Distributed as ISI 2001-20. Figs. 27a & b.

Propagation. Cuttings.


27a


27b

***Aloe* 'Chaba' J.-A. Audissou**

Description. Alsterworthia International 6(3)23.

Parentage. (*Aloe bakeri* x *Aloe haworthioides*) x *Aloe* 'Cha Cha'.

Description. Light to medium-green, somewhat-curved leaves with prominent, flat to slightly raised opaque spots, which rarely terminate in a spine. Prominent short, marginal teeth. In strong sun the leaves may turn reddish-brown. This cultivar offsets freely. Fig. 28.

Propagation. Offsets.

***Aloe* 'Cha Cha' J. Bleck.**

Description. C&SJ. USA 65(2)74

Parentage. (*A. descoingsii* x *A. jucunda*) x (*A. descoingsii* x [*A.. parvula* x *A. boiteaui*])

Comments. A clone of a complex Bleck hybrid #1596 selected for its broad, attractively white spotted leaves with fine teeth at the margins and for its freely produced, short-tubed, red-orange flowers. It resembles a giant *Aloe descoingsii*. Fig. 29. It was distributed as ISI 97-52. Plants advertised as ISI 93-21 were never distributed because of frost damage.

Propagation. Offsets.

***Aloe* 'Coromandel Gold' T. Saunderson**

Description. Alsterworthia International 5(3)17-18.

Parentage. To be disclosed when further attempts to recreate the cross have been completed.

Comments.
Fast growing and strong from an early age. Flowered about 3 years old, producing a stunning 3-branched candelabra-form inflorescence of dense racemes of pure yellow flowers, a colour unusual in dense-racemed aloes. Notably the racemes commenced opening at the midpoint (vertically speaking). The following year it produced a 10-branched inflorescence. Planted in the garden in New Zealand, fully exposed to the sun and elements, it grew well. There the flower buds develop a red tinge and, with the open flowers a vibrant yellow, an attractive two-tone effect was produced. By now it produced multiple inflorescences with huge quantities of flowers. Figs. 30a-c. It then suffered the worst winter in many years. After loads of rain, hail and numerous frosts, most of the inflorescences aborted and rotted leaving the plant somewhat sad and bedraggled. During the summer several branches sprouted from the base, so it is now being propagated vegetatively.

Propagation. Offsets.

Aloe 'Flurry' J. Trager

Description. C&SJ USA 69(2)89.

Parentage. *Aloe sinkatana* x *Aloe rauhii*

Comments. A vigorous, simple hybrid made by R. Grim of San Jose, California. White spotted, glaucous leaves. Freely produced, orange flowers with yellow tips. Fig. 31. The names alludes to the blizzard-like flurry of spots on the glaucous leaves and to the repeated flowering which suggests a constant flurry of activity. There are two clones of this cultivar. Clone No. 1 was distributed as ISI 97-54.

Propagation. Offsets. Seed a possibility from two clones?

Aloe 'Grande' J. Bleck ex S. Riley.

Description. Cact. File 1(11) 22.

Parentage. (*A. descoingsii* x *A. parvula*) x [(*A. albiflora* x A. bellatula) x (*A. descoingsii* x *A. parvula*)]

Comments. A small, complex Bleck hybrid #1522 with strong small teeth and narrow, dark green leaves with dull, whitish spots. The leaves turn blackish green in strong light. Fig. 32. The Spanish cultivar name is said to have been inspired by the gaucho mascot of the University of California Botanical Garden where Bleck carried out his *Aloe* breeding programme. Distributed as ISI 1995-18

Propagation. offsets.

Aloe 'Green Shark' D.M. Cumming

Description. Haworthiad 13(1)28.

Parentage. Unknown but includes *A. haworthioides.*

Comments. Forms dense clumps to less then 100mm high. Leaves glossy dark-green, a few small teeth on leaf surfaces, marginal teeth 2.5 mm long with crinkly tips, teeth bases same colour as the leaf, tips cream. Fig. 33. Flowers cream with pale pink flush towards the base, green-brown midstriping. See *A.* 'Dainty', page 23.

Propagation. Offsets.


34

Aloe 'Hardy's Dream' Mays & Trager

Description. Alsterworthia International 7(1)10**.**

Parentage. A variant from near Tolianaro (Ft. Dauphin), Madagascar. It was described as *Aloe deltoideodonta* 'Variegata' by Rauh in *Succulent and Xerophytic Plants of Madagascar,* an invalid name, and included in *Aloe imalotensis* in the Illustrated Handbook of Succulent Plants - Monocotyledons. As the plant is distinctive and has been brought into cultivation and propagated it was given this cultivar name. It was distributed as ISI 1996-26.

Comments. A smallish, clump-forming *Aloe,* but in this variant the leaves are heavily spotted. Fig. 34.

Propagation. Cuttings.


35a

Aloe humilis 'Reach for the Sky' J. Verhoeven

Description. Alsterworthia International 6(3)6.

Parentage. Presumably a natural variegated form of the species.

Comment. Plant description as for the species but the leaves with few to many, narrow, yellow longitudinal stripes with an occasional broader stripe, or almost all yellow with a few, narrow, green stripes. Some leaves devoid of variegation. Both surfaces of the leaves have prominent tubercles with rounded apices, a few with terminal spines. Density of tubercles much less on the upper leaf surfaces than on the lower. The margins have prominent spines. Tubercles and spines distinctly yellow on variegated leaves, on non-variegated leaves they appear dull white, almost grey. Figs. 35a-c. Free flowering. More than one inflorescence.

Propagation. freely produced offsets.


35b Lower leaf surface.


35c Upper leaf surface.

***Aloe* 'Hellskloof Bells' Trager.**

Description. C&SJ USA 79(2)78.

Parentage. *Aloe pearsonii* (red flowered form)♀ x *A. distans*♂.

Comments. *Aloe pearsonii* is a mountain form from the Hellskoof, *A. distans* a coastal plant, both South Africa, but with no chance of mating naturally. Five seedlings were obtained from the cross, all of which were quite uniform. The influence of the upright stem with columns of leaves of *A. pearsonii* is noticeable in the hybrid, but the leaves are much more spiral and more elongated in the cultivar. Two clones have flowered to date, one red the other much paler as shown in the photographs. Figs. 36a-b. A third clone was distributed as ISI 2007-13 on 2006 but as it had not flowered the flower colour was not known.

Propagation. Offsets.

***Aloe* 'Jelena' D.M. Cumming ex P.I. Forster**

Description. Haworthiad 15(1)22.

Parentage. *Aloe bakeri* x *Aloe karasbergensis.*

Comments. Low growing, forming dense clumps. Leaves glossy grey-green with a few irregular cream spots, marginal teeth cream. Fig. 37. In strong light the leaves become pinkish. Flowers pink-orange.

Propagation. Offsets.

***Aloe* 'Jacobs Ladder' J. Trager**

Description. C&SJ USA 75(2)72.

Parentage. Appears to be a hybrid of *A. dawei*.

Comments. Grown in the Huntington's Desert Garden as *A. dawei* (received originally as *Aloe morogoroensis*, a vegetatively similar species with different flower). The unusual horizontally spreading buds resemble the parallel rungs of a ladder, hence 'Jacobs Ladder'. The uniform pastel orange of its flowers is distinctive. The plant is particularly beautiful after a winter storm when each flower bud holds a drop of rainwater at its tip. Colourful buds give way to pendent flowers that extend the display over much of southern California's winter. Rosettes grow to about 5cm. in diameter. Figs. 38a-b.

Propagation. Cuttings. Distributed as ISI 2003-17.

***Aloe* 'Little One' D.M. Cumming**

Description. Haworthiad 13(3)105.

Parentage. (*Aloe descoingsii* x *Aloe haworthioides*) x *Aloe descoingsii.*

Comments. Rosettes to 50mm high, to 10mm diameter, forms offsets slowly. Leaves dull grey-green to black-green in strong light, with a few small teeth on both surfaces. Marginal teeth 2.5mm long, cream to pale pink. Fig. 39. Flowers cream with pale-pink flush towards base and with green midstriping at tip. A David Cumming hybrid.

Propagation. Offsets.

***Aloe* 'Little Three'**
D.M. Cumming ex P.I. Forster

Description. Haworthiad 14(3)10.

Parents. Unknown but contains *Aloe descoingsii.*

Comments. Clump forming to 70mm high. Leaves triangular-falcate, weakly concave above, convex below, dull green with copious, irregular cream-white spots and teeth. Margins with 2mm teeth. Fig. 40. Flowers orange-pink lower two thirds, upper third cream margins with orange-pink midstriping. Similar to *Aloe descoingsii*, but foliage and floral parts larger. 'Little Three' alludes to the third and small size in a creation of three.

Propagation. Offsets.


41a

***Aloe* 'Lizard Lips' J. Trager**

Description. C&SJ USA 64(2)87.

Parentage. (*A. descoingsii* x *A. calcairophila*) x (*A. bellatula* x *A. rauhii*). A Bleck hybrid #1481.

Comments. Rosette small, leaves dark green, white elongated spots coalesce into irregular transverse bands, margins with small white teeth. Fig. 42. The cultivar name is said to be descriptive of the plant though the plant is far from repulsive even though lizards lips may be. ISI 92-36.

Propagation. offsets.

***Aloe* 'Macho Pink' J. Bleck ex S. Riley**

Description. Cact. File 1(11)22

Parentage. (*Aloe descoingsii* x *A. parvula*) x (*A. albiflora* x *A. bellatula*

Comments. This cultivar is one of Bleck's "first four introductions" developed for their desirable flowers, which are produced nearly non-stop throughout the year. *Aloe* 'Macho Pink' flowers are narrow-campanulate with pinkish, white-tipped petals on slender, erect inflorescences. The leaves are equally impressive, long and narrow with short but prominent marginal, whitish teeth and white spots on both leaf surfaces. Figs. 41a-b. This cultivar was distributed in 1908 under the number ISI 2008-9.


41b

Propagation. Offsets.


42


43

Aloe 'Lok' D. Cumming ex H. Mays

Description. Alsterworthia International 8(2)4.

Parentage. Unknown but includes *Aloe bellatula* and *Aloe descoingsii.*

Comments. A David Cumming hybrid. Leaves dark green with copious cream-white spots; marginal, cream teeth to 0.7mm long. Basal suckers form dense clumps under 120mm high. Fig. 43. Flowers lower two-thirds pale pink, upper third with cream-pink margins and pink-brown midstriping.

Propagation. Cuttings.

Aloe 'Midas' J.A. Audissou

Description. Alsterworthia International 2(1)3.

Parentage. (*Aloe rauhii* x *Aloe bellatula*) x *Aloe sladeniana*.

Comments. Dense, stemless rosette, rarely offsetting. Leaves about 20, sword-shaped, to 14 cm long, 4 cm wide at the base, slightly canaliculate, on both sides many small, dense, mat-white flecks, edges narrowly cartilaginous, light green, with soft pointed cilium-like teeth to 0.5 mm long, few in number. Fig. 44. Inflorescence does not branch. Flowers are about ¾ rosy red to about a ¼ pale rose with paler tips, cream to pale rose, and brownish mid stripes; filaments 21-25 mm, not exserted.

Propagation. Offsets and beheading.


44


45

Aloe 'Midnight' J. Bleck ex S. Riley.

Description. Cact. File 1(11)22.

Parentage. [(*A. descoingsii* x *A. calcairophylla*) x *A. bakeri*] x Bleck 313 (probably *A. descoingsii* x *A. rauhii*)

Comments. A clone of a complex, dwarf, Bleck hybrid. Leaves narrow with occasional spots, marginal teeth. Leaves turn a deep maroon colour when exposed to strong light especially during winter dormancy. Fig. 45. Distributed as ISI 94-18.

Propagation. offsets.

Aloe brevifolia x *Aloe mitriformis* (variegated)

Description. Sources in Belgium and Japan both record this cultivar as having come from the USA where it may have been named originally, though no trace has so far been found of the original publication. This cultivar circulates under different names: *A. ferox* 'Variegata', *A. nobils* 'Fuyajo Nishiki' and *A. mitriformis* 'Inermo-Variegata', all invalid names. *A. nobilis* is recorded as of unresolved application in the Illustrated Handbook of Succulent Plants - Monocotyledons and is therefore rejected. 'Variegata', a Latin name, is inadmissible - Art. 19.13 ICNCP. For the time being it is, therefore, listed under its formula name until the original description can be discovered.

Comments. This cultivar has yellow & pale-green variegation. Colours are best when the plant is grown in bright light, not full sun. Fig. 46. Too much sun will results in the leaf ends turning reddish brown. Continued exposure will result in the green chlorophyll turning red with loss of function. Grows slowly. It appears to be available only in small quantities and infrequently.

Propagation. Offsets. Offsetting can be encouraged by the removal of the top of the plant.


46


47

Aloe 'Novar' D. Cumming ex H. Mays

Description. Alsterworthia International 9(2)4.

Parentage. *Aloe maculata* (variegated) x *Aloe deltoideodonta.*

Comments. A David Cumming hybrid. A small cultivar with prominent, white-flecked, broad leaves and greyish marginal teeth backward pointing. The lanceolate leaves are greyish-green, tinge reddish-brown in full sun. Fig. 47. 'Novar' from the results of the cross - no variegation!

Propagation. Offsets.

Aloe 'Parjav' D. Cumming ex H. Mays

Description. Alsterworthia International 9(2)4.

Parentage. Unknown but includes *Aloe descoingsii* and *Aloe parvula.*

Comments. A David Cumming hybrid. Clumps freely. Small rosettes. Many whitish spines on both leaf surfaces. White, upward pointing marginal teeth. Dark, blackish-green leaves wide at the base then tapering to a point. Fig. 48.

Propagation. Freely produced offsets.


48


49

Aloe 'Pepe' Trager & Kimnach.

Description. C&SJ USA (US):67(2).

Parentage. *A. descongsii* x *A. haworthioides.*

Comments. A clone of a simple Bleck hybrid #309, selected for its conspicuous bristled leaves. The leaves are dark green and are tolerant of shade. Fig. 49. It clusters and is free flowering. Distributed as ISI 95-19.

Propagation. Offsets.

Aloe 'Purple Shark' David Cumming

Description. Haworthiad 12(4)142.

Parentage. Unknown but includes *Aloe parvula.*

Comments. Rosettes under 100mm tall, dense clumps. Leaves lanceolate, dull-green to purple-green in strong light, surface flat, concave below; strong, recurved, marginal teeth. Inflorescence decumbent. Fig. 50. Flowers cream, faint mid-stripes. Offsets freely.

Propagation. Offsets.


50

Aloe 'Quicksilver' Bleck ex J. Trager

Description. C&SJ USA 70(2)80.

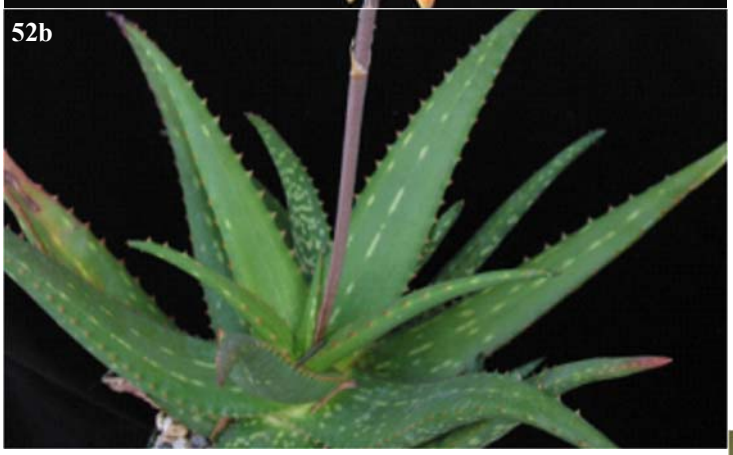
Parentage. ([*A. descoingsii* x *A. calcairophylla*] x *A. bellatula*) x *A. rauhaii.*

Comments. Selected for the dense white flecking on the leaves. Leaves lanceolate, prominent marginal teeth. Fig. 51. The red flowers are similar to those of *Aloe rauhii.* Distributed as ISI 98-32.

Propagation. Offsets, which are produced rather slowly.


51


52a


52b

Aloe 'Silver Cloud' D.M. Cumming ex Max Holmes.

Description. Thornwood Gardens Mail Order Catalogue No. 6. 2000. Australia. Entry 6175.

Parentage. (*Aloe parvula* x *Aloe rauhii*) x unknown.

Comments. Rosette to 60 mm high, 10mm diameter forming dense clumps. Leaves narrow, glaucous silver with copious white spots, margins with teeth to 1mm. Fig. 53. Flower orange-pink lower two thirds, upper third cream margins and grey-green midstriping. Offsets freely. Best when given a little shade.

Propagation. Offsets.


54

Aloe 'Rooikappie' J. Trager

Description. C&SJ US 76(2).

Parentage. *Aloe sinkatana* is its only known parent, which was probably open pollinated.

Comments. Rosettes about 30 cm. Leaves attractively spotted and not prone to tip die back and other blemishes**.** A repeat bloomer - flowers present almost every month of the year at the Huntington Botanical Gardens. Fig. 52a-b. 'Rooikappie' (pronounced roy-copy) is Afrikaans for Little Red Riding Hood.

Propagation. Cuttings. Plants were tissue cultured for the ISI distribution, ISI 2004-13.


53

Aloe 'Sabra' Innes

Description. Ashingtonia 1:67,69 May 1974 as *Guillauminia* 'Sabra' (basionym). Haworthiad 12(1)13

Parentage. *Aloe bellatula* Reyn. x *Aloe albiflora* Bertr.

Comments. Papillose leaves are similar to those of the parents. Free flowering. The multi-inflorescences bear many delicate, shell-pink, campanulate flowers similar to *A. bellatula* in colour, but with the shape of those of *Aloe albiflora.* Fig. 54. This cultivar received an Award of Merit from the Royal Horticultural Society, London on October 31st 1972.

Propagation. Offsets.


55

Aloe 'Sparkling Burgundy' Bleck

Description. Cact. File 1(11): 22, 1993.

Parentage. (*A. albiflora* x Bleck 313 which is probably *A. descoingsii* x *A. rauhii*) x *A. glauca.*

Comments. A clone of a complex, dwarf Bleck hybrid. The leaves have a lively, deep wine colour especially under strong light, lightly white-spotted, brown marginal teeth. It produces offsets and also divides dichotomously. Fig. 55. Distributed by the ISI as ISI 94-19.

Propagation. Offsets. Also by vertical division of the dichotomous branches.

Aloe 'Spence's Superb' S. Spence

Description. Alsterworthia International 6(3)3.

Parentage. *Aloe bellatula* x *Aloe haworthioides.*

Comments. Dwarf hybrid, rosettes more open than *A. haworthioides*, leaves narrow more robust, brighter green and shinier, fine white teeth more pronounced and sparser. Fig. 56. Free flowering, compact, forms dense clumps. Inflorescences, profuse, make an eye-catching display, similar to *A. haworthioides*, flowers pinkish with white tips to the tepals. Suitable for growing in a glass-house or outdoors in a very dry, frost-free, sheltered location.

Propagation. Offsets.


56


57

Aloe 'Tangerine' J. Trager

Description. C&SJ USA 75(2)73.

Parentage. A mystery. At the Huntington it grew among a mass of *A.* ×*principis*, a natural hybrid of *A. arborescens* and *A. ferox*. It may be a spontaneous seedling from that hybrid or a natural colour variant of it.

Comments. It stands out by virtue of its rich tangerine-orange buds that open into yellow-orange flowers. The inflorescences colour up early in bud development, extending the colour display to a couple of months as part of the general riot of winter-flowering aloes at the Huntington. Fig. 57. Distributed as ISI 2003-19.

Propagation. Cuttings.

Aloe 'Tiny Gem' J.-A. Audissou

Description. Alsterworthia International 2(1)7.

Parentage. *Aloe descoingsii* x *Aloe sladeniana*.

Comments. This Madagascan-Namibian hybrid combines the dwarf, spreading to recurved leaved rosette of the Madagascan *A. descoingsii* with the small, more upright leaved rosette of *A. sladeniana* from Namibia. The overall form of *A. sladeniana* is preserved in the hybrid, but the leaves are less chunky with a more graceful tapering point, presumably inherited from *A. descoingsii*. Both parents and the offspring exhibit whitish flecks and tubercles. Fig. 58.

Propagation. Offsets.


58


59

Aloe vanbalenii Pillans variegated.

Description. Not known. Japanese origin?

Parentage. Presumably naturally occurring variegation in the species.

Comments. Similar to the species, but with pale-yellow margined leaves. Central broad, light green stripe has longitudinal, narrow, pale-yellow stripes running through it**.** Fig. 58.

Propagation. Offsets.

Aloe variegata Linné 'Chiyoda no Hikari'

Description. The location of the original description is not know. Japanese in origin.

Parentage. Presumably natural variegation in the species.

Comments. Yellow replacing some green in a species which is naturally variegated with white latitudinal stripes on green. Fig. 59. Rare.

Propagation. Offsets.


60


61

Aloe 'Versad'

Description. Haworthiad 12(1)13 & 21.

Parentage. *Aloe variegata* x *Aloe descoingsii.*

Comments. This cultivar combines the general features of *Aloe descoingsii* with the more robust leaves of *Aloe variegata*, which are prominently spotted white. Margins cartilaginous. Fig. 60.

A David Cumming hybrid. Varsad = anagram of the first three letters of the parent species names.

Propagation. Offsets.

***Aloe* 'Twister' S. Gildenhuys.**

Description. Alsterworthia International 9(2)18.

Parentage. *Aloe pictifolia* x *Aloe variegata.*

Comments. Leaves lanceolate, spiralling in three tiers, green, irregularly spotted white on both leaf surfaces, edges white, cartilaginous. Rosette diameter 32cm. Leaf width 4.4cm. The influence of *Aloe pictifolia* is seen in the spotted, lanceolate leaves; that of *Aloe variegata* in the tiered formation, the cartilaginous edges and the much tidier appearance of the rosette. Fig. 62. Flowers are mid way between both parents - a soft pinkish red colour. Height about 50cm.

Propagation. Offsets. If reluctant behead .

***Aloe wickensii* Pole-Evans 'Sean Gildenhuys' H. Mays.**

Description. Alsterworthia International 9(2)17.

Parentage. A spontaneous variegate in a batch of seedlings from seed sown by Sean Gildenhuys, Gariep Plants, South Africa, as *Aloe wickensii* Pole-Evans. The name *Aloe wickensii* is recorded as a synonym of *Aloe cryptopoda* Baker in the Illustrated Handbook of Succulent Plants - Monocotyledons, but in South Africa it is widely regarded as distinctly different. If you do not agree, the cultivar name will be *Aloe cryptopoda* 'Sean Gildenhuys' H. Mays.

Description. As for the species except that the green leaves have yellow to greenish-yellow vertical stripes of varying widths, ranging from quite narrow up to about one quarter of the leaf width. Fig. 63.

Propagation. Offsets.

Aloe 'Wunderkind' Kemble.

Description. C&SJ US 76(2).

Parentage. Derived from a choice form of *Aloe deltoideodonta.* Brian Kemble, curator at the Ruth Bancroft Garden in Walnut Creek, California attempted to cross it with pollen of *Aloe somaliensis* var. *marmorata.* The cross was unsuccessful, but the plant apparently selfed to produce this clone.

Comments. 'Wunderkind' is characterised by beautiful, white-spotted, tuberculate leaves with marginal teeth joined into elongate, molar-like groupings as in the parent, but it offsets prolifically while the parent is largely solitary. Inflorescences are showy and upright with pinkish flowers. Suitable as a dwarf container specimen or a rockery subject, frost free. Figs. 64a-b. Distributed as ISI 2004-16

Propagation. Cuttings.

Aloe zebrina Baker 'Chapple's Yellow' Trager.

Description. C&SJ USA 80(2)58.

Parentage. Rare yellow flowered variants of the species collected by Roy Chapple, a medical officer for Rhodesia Railways during his journeys on the railways through the territory of Botswana, at the small village of Hildavale.

Comments. As with the species, it has the typically white-spotted leaves arranged in compact rosettes that offset to form colonies. The leaf-spots are grouped into bands. The leaves dry naturally at the tips even under lush growing conditions. The flowers are normally a dull, pinkish color, but in this cultivar they are yellow. Fig. 65a-b.

This cultivar named only in 2008 when it was distributed by the ISI under number ISI 2008-12 has been in cultivation in Zimbabwe (formerly Southern Rhodesia) and then in Tucson, Arizona since 2001 by Anthon Elert who reports that it grows equally well in full sun and part shade.

Propagation. Offsets.


66

***Aloe* 'Snow Flake' x *Aloe* 'Doran Black' C.B. Wright ex Mays & Trager**

Comments. The leaves of this hybrid are dark green, slightly concave with distinctly-protruding, spiked, white markings and robust, irregular, marginal teeth, the influence of 'Snow Flake'. Fig. 66.

Propagation. Offsets.


67

***Aloe* 'Hardy's Dream' Mays & Trager x (A. *bellatula* Reynolds x *A. rauhii* Reynolds)**

Parentage. One parent was recorded as *Aloe deltoideodonta* Baker variegated which is now named *Aloe* 'Hardy's Dream'.

Comments. The leaves are dark green, top surface flat with many smooth, white markings and symmetrical white teeth. Marginal teeth greenish white. Fig. 67.

Propagation. Offsets and beheading to promote offset production.


68

(*Aloe rauhii* Reynolds x *Aloe albiflora* Guillomin) x *Aloe* 'Snow Flake'

Comments. A small cultivar with narrow, slightly curving leaves, randomly spotted white with brownish cartilaginous margins and small marginal teeth. Fig. 68.

Propagation. Offsets.

Aloe aristata Hayworth x _Gasteria_ 'Little Warty' Cumming.

Comments. Progeny variable, partly due to the mixed parentage of one parent. A good range of very attractive, smooth to warty-leaved, silver and green variegated plants have been produced by Russell Scott, Australia. Fig. 69. He used a non-offsetting, possibly mountain form of *A. aristata.* As *A. aristata* is frost hardy it can contribute a degree of hardiness to progeny.

Propagation. Offsets and leaf cuttings.

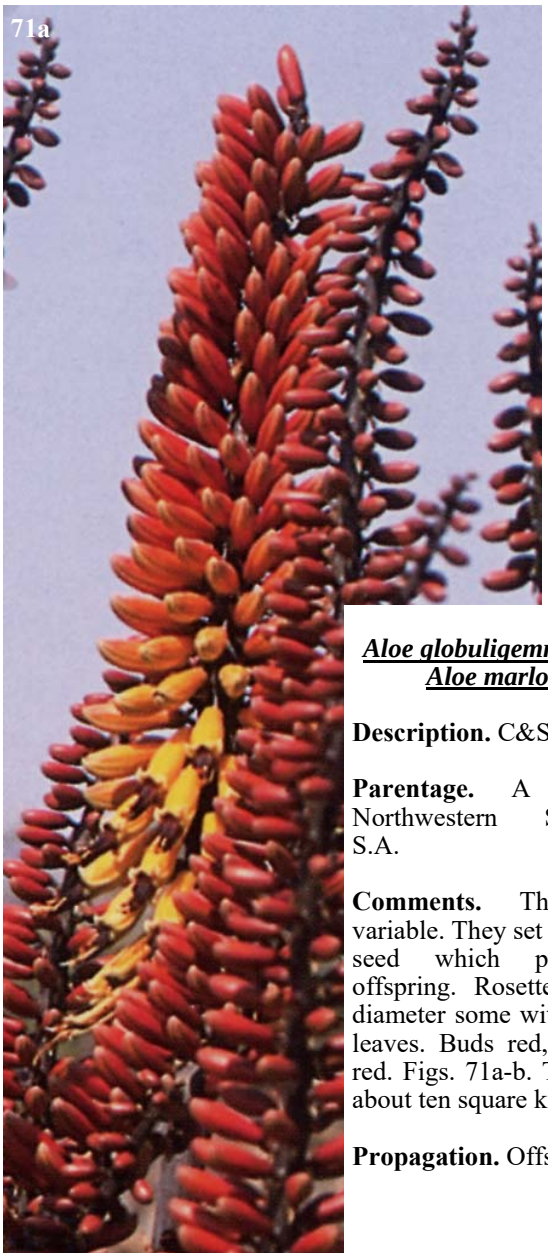

69

Aloe jucunda Reynolds x _Aloe arborescens_ Miller

Comments. A smallish, simple hybrid. Dark, dull-green leaves with large, dull whitish spots. Strong, for the size of plant, brownish marginal teeth. Fig. 70. No cultivar name has been published as far as is known. See also Bill Morris.

Propagation. offsets.


70


71a

Aloe globuligemma Pole-Evans x _Aloe marlothii Berger_

Description. C&SJ 75(5)193.

Parentage. A natural hybrid Northwestern Sekhuukhuneland, S.A.

Comments. The hybrids are variable. They set large quantities of seed which produce variable offspring. Rosettes up to 2m. in diameter some with spirally twisted leaves. Buds red, Flowers orange-red. Figs. 71a-b. The hybrids cover about ten square kilometres.

Propagation. Offsets and seed.


71b

Astroloba cultivar

Astroloba bullulata **(Jacquin) Uitewaal 'Ginkaku' Hirao ex Hayashi**

Description. Haworthia Study 14:3.

Parentage. A clone from habitat, South Africa.

Comments. As for the species except that this clone has silver leaves (species dull greenish brown). The possibility that this clone may have hybrid genes cannot be ruled out but this is not a certainty. A very robust plant. Fig. 72.

Propagation. Offsets.

***Bulbine frutescens* Wolf**
Fig. 74

For comparison - the flowers of the species.

***Bulbine frutescens* Wolf 'Hallmark' G,D. Rowley**

Description. Ashingtonia 1(1)8.

Parentage. Seed obtained by Harry Hall from a garden in Johannesburg. The owner believed the plants to be habitat collected, but did not provide habitat details.

Comments. Lax, branching shrublet. Elongated stems produce long, stiff, wiry prop roots. Leaves to 15cm. long, 8mm broad, linear, very soft and brittle, grass green with slight glaucous bloom, D-shaped in section - upper surface slightly flattened, crowded at the apices, distinct nodes below. Flowers as for the species except that the colour is brilliant tangerine (orange), fig. 73, not yellow.

Propagation. Cuttings, which may have already produced roots.

***Bulbine frutescens* Wolf 'Virgo' G.D. Rowley**

Description. Ashingtonia 1(11)128.

Parentage. Wild plants collected at Vallkop near Calitzdorp by Bayer-Newton-Rowley and at Stytlerville by Rawe.

Comments. This cultivar is a white flowered variant of the species. In the species the flowers are yellow with greenish midstripes, in *Bulbine frutescens* 'Virgo' the flowers are white also with greenish midstripes. Plants from seed are uniform and as far as is known all have white flowers. Fig. 75.

Propagation. Cuttings and seed.

Nothogenera cultivars

x*Alworthia* 'Black Gem' Jacobsen

Description. Lexicon of Succulent Plants, 103.

Parentage. *Haworthia cymbiformis* (Haworth) Duval x *Aloe* sp. (This cultivar can be found under *Aloe* 'Black Gem' & x*Gasteraloe* 'Black Gem' both invalid.)

Comments. The leaves are soft, smooth, green in shade, but turn blackish red in sun. With too much sun in dry conditions the leaf ends die back. Offsets readily. Seems not to flower. Fig. 76.

Propagation. Offsets.


76


77

×*Astroworthia* 'Towering Inferno' Trager.

Description. C&SJ 80(2)59

Parentage. Unknown.

Comments. This cultivar appears to include one of the smooth-leaved *Astroloba* species which have similar leaves to the stacking, spiraling leaves of this cultivar. It has been suggested that *Haworthia coarctata* Hayworth may have contributed to its foliage with the hint of tubercles on the leaf-surfaces. The plant came to the Huntington Botanical Gardens in Jan. 2001 in the collection of Los Angeles resident Stan Green. It has stiff, narrow-triangular, pointed leaves that blush a fiery reddish colour. Distributed under number ISI 2008-13. Figs. 78a-b.

Propagation. Offsets.

×*Astroworthia bicarinata* G.D. Rowley

Description. NCSJ 28(1)7. (Originally as *Apicra bicarinata* Haworth (1819).

Parentage. *Astroloba corrugata* Myer & Smith x (*H. margaritifera* now classified as) *Haworthia maxima* (Hayworth) Duval, a natural hybrid.

Comments. Leaves dark green, with tubercles and upturned tips, in five vertical rows. Compact in nature but somewhat more open in cultivation. To 30 cm tall or more in cultivation. Fig. 77.

Propagation. Cuttings.


78a


78b

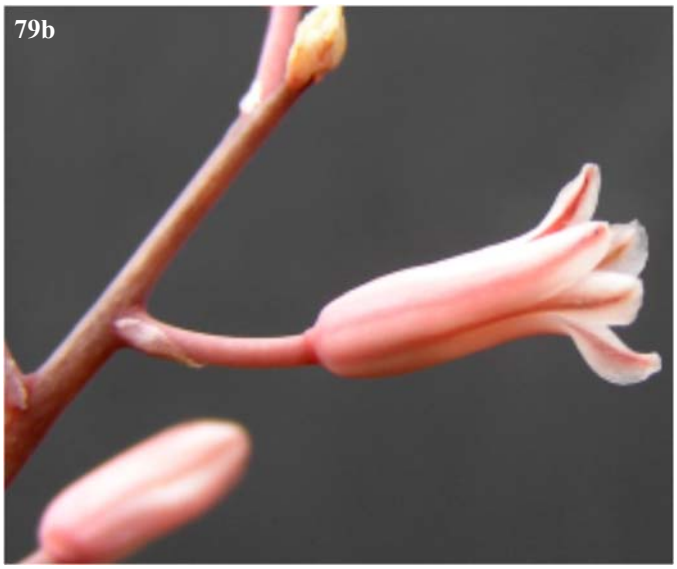
×*Bayerara* 'Triple Chance' D.M. Cumming & J. Frew.

Description. Alsterworthia International 9 (3)4-5.

Parentage. (*Haworthia venosa* subsp. *granulata* (Marloth) M B Bayer x *Gasteria bicolor* v. *liliputana* von Poellnitz) x [(*Aloe parvula* A. Berger x *Aloe descoingsii* Reynolds) x (*Aloe millotii* Reynolds x *Aloe bakeri* Scott - Elliot)]

Comments. Rosette 90 mm diameter, 64 mm high. Leaf number 23, 36mm long, 18mm wide; colour dull, dark green, reddish towards base of leaf, with paler green spots, rough, serrated edges. Flowers pale pink with darker median line, 20mm long, lips 6mm across lobes. Intermediate between parents. Slow growing. Figs. 79

Propagation. Beheading to promote offset production.



***Gasteraloe* 'Manik-Anita' S. Aditya**

Description. Alsterworthia International 9(3)17

Parentage. (*G. carinata* v. *verrucosa* x *G. Batesiana*) ♀ x (*Aloe deltoideodonta* x *Aloe descoingsii*) ♂.

Comments. Leaves hard, boat shaped; margins with sharp, short, whitish teeth; terminal point sharp; surface green, but raised whitish spots arranged in variable latitudinal bands on both surfaces provide an overall whitish appearance. New leaves and the peduncle are initially glaucesent. Peduncle bifurcate and very long up to 2 feet. Flowering time early in May. The plant in the photograph is 10cm across and 8cm in height.

Propagation. Offsets and leaf cuttings.

×*Gasteraloe* 'Doreen' D. Cumming

Description. Probably a David Cumming plant list, which may no longer exist.

Parentage. *Aloe descoingsii* Reynolds x *Gasteria bicolor* v. *liliputana* (Poelln.) van Jaarsveld.

Comments. Leaves long and narrow, dark green with silvery spots and short lines, silver leaf edges incurving with fine teeth. The extent of the incurving is dependant on the turgidity of the plant. Offsets freely. Fig. 81.

Propagation. Offsets.

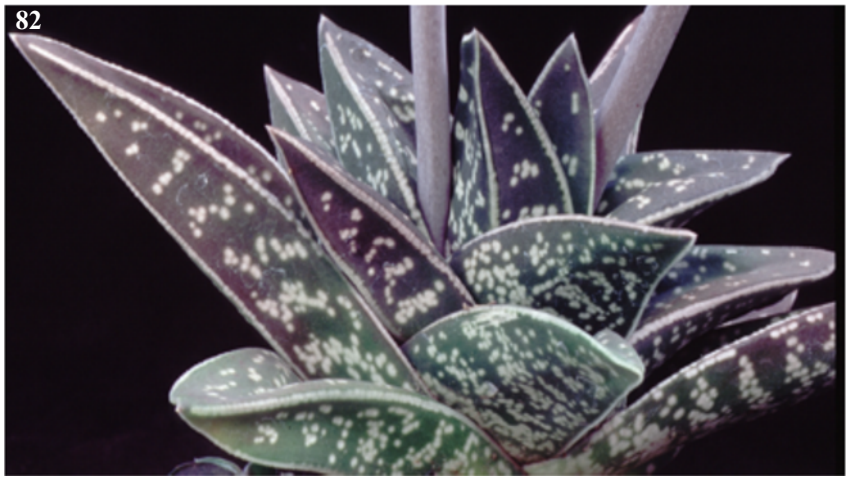
×*Gasteraloe* 'Goliath' J. Trager

Description. C&SJ US 76(2)

Parentage. *Aloe variegata* Linné x *Gasteria* (*brachyphylla*?).

Comments. Slow-growing, compact, beautifully mottled foliage, showy floriferous. Fig. 82. Several features indicate *G. brachyphylla* may be involved: compact, slow growth; dark green, purple-blushed, smooth-surfaced leaves with few tubercles on the margins; floriferous, unbranched inflorescences bearing colourful red-orange, green-tipped flowers. The buds are distinctive with slender, ascending tips.

Propagation. Cuttings. Distributed as ISI 2004-22.



***Gasteraloe* 'Green Ghost' D. Cumming**

Description. A David Cumming plant list?

Parentage. *Gasteria* 'Old Man Silver' hort ex R. Scott x *Aloe variegata* Linné.

Comments. Leaves greyish-green, spotted white, some with paler longitudinal stripes, a few are dark-green with transverse, greyish-spotted stripes. Chunky offsets form between the leaves as the plant becomes larger, causing the leaves to twist. Fig. 83.

Propagation. Offsets.

×*Gasteraloe* 'Green Ice' D. Cumming

Description. Probably a David Cumming plant list.

Parentage. *Aloe variegata* Linné x *Gasteria* 'Old Man Silver' hort ex R. Scott.

Comments. Leaves very pale green with whitish margins, dark green longitudinal stripes on some leaves, whitish spots. *Gasteraloe* 'Green Ghost' is similar, but lacks the dark green stripes. Fig. 84.

Propagation. Offsets and leaf cuttings.


85

x*Gasteraloe* 'Kabela' Russell Scott

Description. Alsterworthia Int. 6(1)2.

Parentage. *Gasteria* 'Perfectus' Cumming ex R. Scott x *Aloe aristata* Haworth. *G.* 'Perfectus' is a David Cumming hybrid. The *A. aristata* was a rigid leaf form not known to offset.

Comments. *Gasteraloe* 'Kabela', fig. 85, has characteristics intermediate between its parents. Rosette around 25cm diam., circa 15cm tall, leaves around 12-14cm long, around 3 cm broad at the base, tapering to a fine hair at the tip, fine teeth along the leaf margins and scattered tubercles. Like its *Gasteria* parent, the leaves are pale silver green with darker green margins. 'Kabela' is Swahili for Tribe.

Cultivation. Despite being passed around by offsets - offsetting is not common. Plants will remain solitary for some time. Gary Robinson, Western Australia, who proposed the cultivar name, has tissue cultured about 10,000.


86

×*Gasteraloe* 'Lucia' J.A. Audissou

Description. Alsterworthia International 2(1)4.

Parentage. *Gasteria glomerata* van Jaaraveld x *Aloe parvula* A. Berger.

Comments. x*Gasteraloe* 'Lucia' has the longer leaves in rosette formation of *A. parvula*, but as in x*Gasterhaworthia* 'Sabrina' the leaves are highly, succulent indicating the influence of *G. glomerata*. The leaves are a medium green with prominent, relatively large tubercles. Fig. 86

Propagation. Leaf cuttings.


87

×*Gasteraloe* 'Prince Warty' J.A. Audissou

Description. Alsterworthia Int. 6(3)23

Parentage. *Aloe prinslooi* Verdoorn & Hardy x *Gasteria* 'Little Warty' D. Cumming.

Description. The leaf pattern is clearly influenced by *G.* 'Little Warty', the leaf shape and length by *A. prinslooi.* Leaves lanceolate, yellowish green with green stripes of varying width, scattered with yellowish green dots and occasional lines. Fig. 87.

Propagation. Offsets.

×*Gasteraloe* 'Spirit of 88' D. Cumming

Description. A David Cumming plant list?

Parentage. *Aloe* 'Langdon' x *Gasteria* 'Little Warty' D. Cumming.

Comments. Stems to about 25 mm high. Leaves dark green with silvery spots and silvery-green, thin and thick vertical stripes. The upper part of the plant with age loses the variegation to become silver-green. Fig. 88. Offsets freely.

Propagation. Offsets.

×*Gasteraloe* 'Syrah' J.A. Audissou

Description. Alsterworthia International 6(3)22.

Parentage *Gasteria nitida* var. *nitida* Salm-Dyck 'Beckeri' x *Aloe sladeniana* Pole-Evans.

Description. Leaves initially distichous, eventually forming a rosette, dark green with many scattered, opaque spots on both leaf surfaces. Short, blunt, opaque teeth on leaf margins, which are horny at the leaf end, with firm terminal spine. Fig. 89. Offsets freely.

Propagation. Offsets.

***Gasteraloe* 'World Beauty'**

Description. Not traced.

Parentage. *Gasteria glomerata* van Jaarsveld x *Aloe parvula* A Berger.

Comments. Leaves elongated, rough with many tubercles, thick, tapering to a twisted end with a spine. Fig. 90. Reported to be a sensitive plant which does not like too much sun.

Propagation. Offsets and leaf cuttings.

×*Gasterhaworthia* 'Bayfieldii' Salm-Dyck

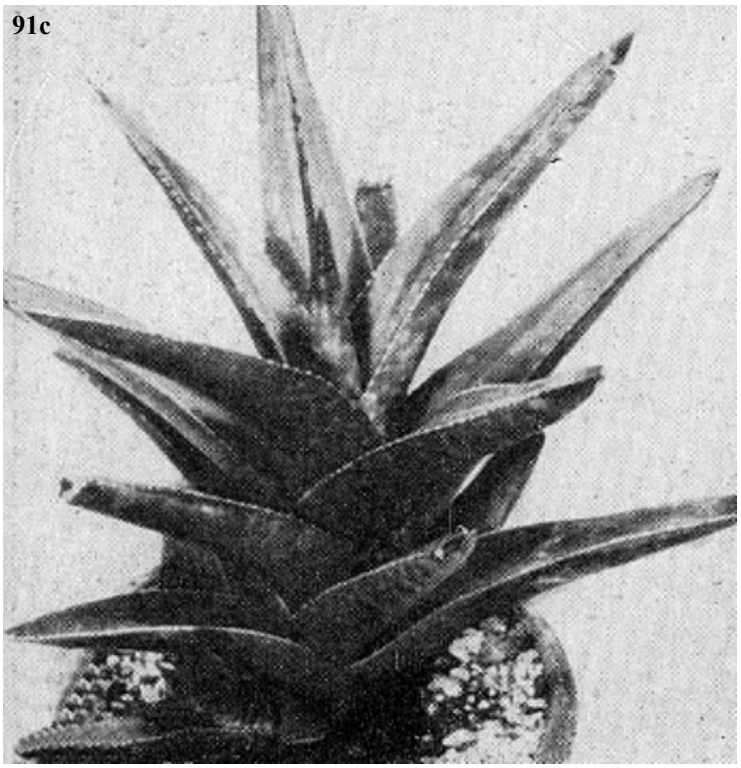
Description. Salm-Dyck 1842 as *Aloe bayfieldii* amended to ×*Gasterhaworthia* 'Bayfieldii' (Salm-Dyck) Rowl. In N.C.S.J. 9:74-76, 1954.

Parentage. Cultivar of an unknown *Gasteria species* x *Haworthia species.*

Comments. Stems to 30cm tall, branches basally; leaves to 14 cm long to 3cm across at the base, tip mucronata, concave grooved on the upper surface, convex and distinctly carinate at the tip on the under side with many raised spots often in distinct transverse lines, margins cartilaginous with low tubercles, leaves spiralled in several rows

Photo 91a - plant in cultivation, 92b - Salm-Dyck's original illustration, 93c - plant in cultivation form Lexicon of Succulent Plants. The illustrations show some variability in stem length and compactness no doubt due to cultivation conditions. All photos originate with Gordon Rowley.

Propagation. Cuttings.




92

×*Gasterhaworthia* 'Black Delight' D. Cumming

Description. Alsterworthia International 9(2)4.

Parentage. Thought to be *Haworthia nigra* (Haworth) Baker x *Gasteria baylissiana* Rauh.

Comments. Slow growing. Leaves tuberculate, about 30mm long, 10mm wide. Very dark, shiny in good light. Fig. 93.

Propagation. Offsets and leaf cuttings.

×*Gasterhaworthia* 'Black Chap' D. Cumming

Description. Alsterworthia International 7(1)16

Parentage. *Haworthia nigra* (Haworth) Baker x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld

Comments. Rosette, diameter 40 mm, 30mm high. Leaf number 8, 30mm long, 15 mm wide, dark green to black/green, rough warty, angular with sharp keel, acute, tip offset as in some forms of *Gasteria bicolor* v. *liliputana*. Fig. 92.

Propagation. Offsets and leaf cuttings.


93


94

×*Gasterhaworthia* 'Black Lad' D. Cumming

Description. Alsterworthia International 7(1)17.

Parentage. ×*Gasterhaworthia* 'Black Chap' Cumming x *Gasteria baylissiana* Rauh.

Comments. Rosette 40mm diameter, distichous when young, 20mm high. Leaf number 8, 25 mm long, 15 mm wide, blunt, warty, almost black. Fig. 94

Propagation. Easily propagated from leaves.

x*Gasterhaworthia* 'Black Snake' G. A. Audissou

Description. Alsterworthia International 2(1)4.

Parentage. *Haworthia koelmaniorum* Obermeyer & Hardy x *Gasteria baylissiana* Rauh.

Comments. Juveniles distichous, adults rosettes. Leaf shape similar to *G. baylissiana*. Leaves dark green. Distribution of whitish tubercles reminiscent of those in *G. baylissiana.* In strong light the leaves take on a darker, blackish coloration. A young plant developing into a rosette and developing darker colouration is shown. Fig 95.

Propagation. leaf cuttings.


95

×*Gasterhaworthia* 'Bragil' D. Cumming

Description. Alsterworthia International 7(2)16

Parentage. [*Haworthia granulata* Marloth x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld] x *Gasteria baylissiana* Rauh.

Comments. Plant distichous, 40 mm. Leaf number 10, 20 mm long, 15 mm wide, light green, some faint markings. Fig. 96.

Propagation. Offsets.


96


97

×*Gasterhaworthia* 'Demas'

Description. Not traced. Origin USA? Alsterworthia International 7(2)14 will be the original description if no other exists.

Parentage. *Haworthia limifolia* Marloth x *Gasteria sp*. unknown.

Comments. Rosette, diameter 60 mm, 35 mm high. Leaf number 14, 40 mm long, 20 mm wide, dark olive green, fine lines and warts. Fig. 98.

Propagation. Offsets and leaf cuttings.


99

×*Gasterhaworthia* 'Coolill' D Cumming

Description. Alsterworthia International 7(2)10

Parentage. *Haworthia cooperi* Baker x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld.

Comments. Rosette, 70 mm, 35 mm high. Leaf number 14, 40mm long, 15 mm wide, reddish green with small white spots, many fine teeth along edge. Fig. 97.

Propagation. Offsets.


98

×*Gasterhaworthia* 'Duan' D. Cumming

Description. Alsterworthia International 7(2)11.

Parentage. *Haworthia gracilis* v. *isabellae* (von Poellnitz) M. B. Bayer x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld.

Comments. Rosette, diameter 50mm, 30 mm high. Leaf number 18, 30mm long, 10 mm wide, reddish green, fine teeth along edge. Fig. 99.

Propagation. Offsets.


100a


100b

×*Gasterhaworthia* 'Double Trouble' D. Cumming

Description. Alsterworthia International 7(2)13

Parentage. *Haworthia angustifolia* Haworth x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld.

Comments. Rosette diameter 70mm, 35 mm high, 'Viviparous -prolific', producing up to six plants per peduncle. Leaf number 15, 35 mm long, 10 mm wide, reddish green. The colour is influenced to some extent by the intensity of the sun. Figs. 100a -b.

Propagation. Offsets.


101

×*Gasterhaworthia* 'Fandango' D. Cumming

Description. Alsterworthia International 7(1)17

Parentage. ×*Gasterhaworthia* 'Granlill' Cumming x *Gasteria batesiana* G. D. Rowley.

Comments. Rosette diameter 75 mm, 40 mm high, offsetting. Leaf number 12, 45 mm long, 15 mm wide, dull green with white spots, warty, finely serrated edge. Fig. 101. Prolific grower.

Propagation. Offsets and leaves.

Gasterhaworthia 'Flipper'

Description. Not traced.

Parentage. *Haworthia pygmaea* von Poellnitz x *Gasteria* sp.

Comments. Leaves oval, relatively thin, dark green with many small, whitish tubercles and fine marginal teeth. Young growth appears silvery because of the many silvery spots on short leaves. Fig. 102. If the plant is kept in full sun it remains very compact. It should be watered regularly and fertilized economically.

Propagation. Offsets and leaves.


102

×*Gasterhaworthia* 'Granlill' D. Cumming.

Description. Alsterworthia International 7(1)16.

Parentage. *Haworthia granulata* Marloth x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld.

Comments. Rosette diameter 35 mm, 30 mm high, offsetting. Leaf number 8, 20 mm long, 8 mm wide, dark green, with finely serrated edges. Fig. 103.

Note. Leaves split easily with over-watering.

Propagation. Offsets & leaves.

×*Gasterhaworthia* 'Grinil' D. M. Cumming.

Description. Alsterworthia International 7(2)15.

Parentage. *Haworthia granulata* Marloth x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld) x *Haworthia nigra* (Haworth) Baker.

Comments. Rosette, diameter 60 mm, 45 mm high, slowly forming clumps. Leaf number 12, 35 mm long, 20 mm wide, reddish black, hard, acute. Fig. 104. Note. Leaves easily split with over-watering.

Propagation. Offsets.

×*Gasterhaworthia* 'Li Lion' D. M. Cumming.

Description. Alsterworthia International 7(2)16.

Parentage. (*Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld x *Haworthia longiana* von Poellnitz) x *Haworthia nigra* (Haworth) Baker.

Description. Rosette, diameter 35 mm. Leaf: number 8, 25 mm long, 15 mm wide, dark green, some reticulation, warty. Fig. 105.

Propagation. Offsets & leaves.

×*Gasterhaworthia* 'Limuk' D. Cumming

Description. Alsterworthia International 7(2)15.

Parentage. *Haworthia limifolia* Marloth x *Gasteria* sp./hybrid.

Description. Rosette diameter 40 mm, 35 mm high, offsetting. Leaf number 10, 35 mm long, 20 mm wide, reddish green/brown, ribbed as in limifolia. Fig. 106. Note. Many forms of *limifolia* are tetraploid, most gasterias are diploid, therefore most hybrids resemble the *Haworthia*.

Propagation. Offsets and leaves.


107

×*Gasterhaworthia* 'Loga Grill' D. Cumming

Description. Alsterworthia International 7(2)14.

Parentage. (*Haworthia granulata* Marloth x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld) x *Gasteria glomerata* van Jaarsveld.

Comments. Rosette diameter 60 mm, distichous when young, 10mm high. Leaf 35 mm long x 15 mm wide, grey green with reddish-white, slightly raised spots sometimes in irregular transverse bands. Fig. 107.

Propagation. Offsets and leaves.

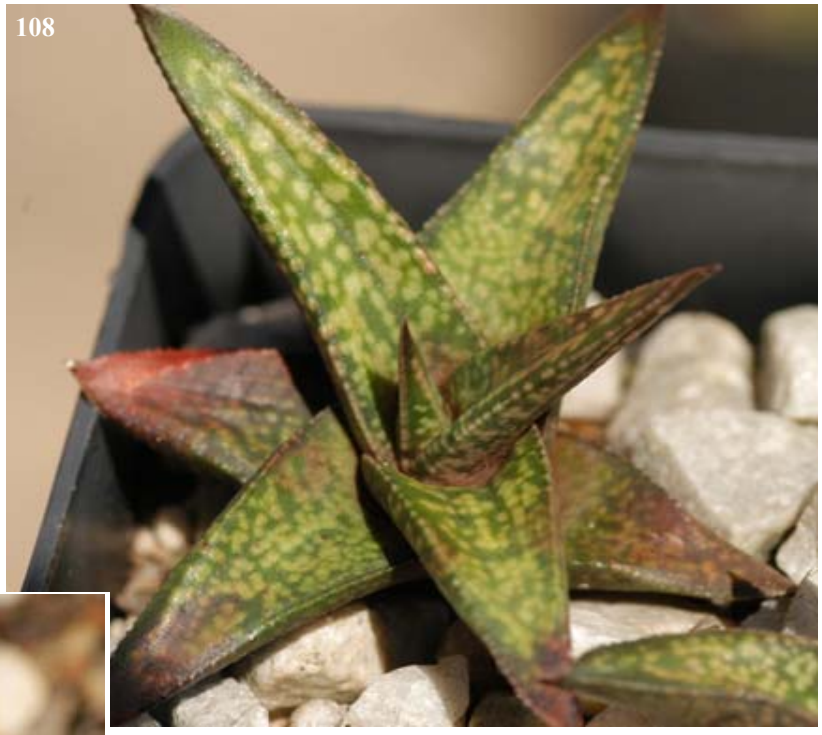
×*Gasterhaworthia* 'Longlill' D. Cumming

Description. Alsterworthia International 7(2)15.

Parentage. *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld x *Haworthia longiana* von Poellnitz.

Comments. Rosette, diameter 90 mm, 40 mm high, slowly offsetting. Leaf number 10, 45 mm long, 20 mm wide, bright green, small spots, finely serrated, acute. Fig. 108. Note: partially fertile.

Propagation. Offsets and leaf cuttings.


108


109

×*Gasterhaworthia* 'Lorial' D. Cumming

Description. Alsterworthia International 7(2)12.

Parentage. (*Gasteria bicolor* v. *lilliputana* (von Poellnitz) van Jaarsveld x *Haworthia longiana* von Poellnitz) x *Gasteria nitida* v. *armstrongii* (Schonland) Van Jaarsveld.

Description. Plant 50 mm broad, 10 mm high. Leaves distichous, 25mm long x 15 mm wide, dark shiny green turning reddish in strong light, leaf imprint noticeable as in some forms of *Gasteria nitida* v. *armstrongii*. Fig. 109.

Propagation. Offsets and leaf cuttings.

×*Gasterhaworthia* 'Pyglill' D. Cumming.

Description. Alsterworthia International 7(2)11.

Parentage. *Haworthia pygmea* von Poellnitz x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld.

Comments. Rosette diameter 35 mm, 20 mm high, offsetting slowly. Leaf number 11, 25 mm long, 15 mm wide, dark green with white markings/spots. Turns reddish in bright light. Fig. 111.

Propagation. Offsets and leaf cuttings.

×*Gasterhaworthia* 'Rimail' D. Cumming.

Description. Alsterworthia International 7(2)16.

Parentage. [*Haworthia limifolia* Marloth x *Gasteria* 'Missu Fuji' (Japanese Hybrid)] x *Gasteria nitida* v. *armstrongii* (Schonland) van Jaarsveld.

Comments. Leaves distichous, 40mm, clump forming. Leaf number 8, 22 mm long, 15 mm wide, dark green, warty. Fig. 113.

Propagation. Offsets.

×*Gasterhaworthia* 'Mutlill' D. Cumming

Description. Alsterworthia International 7(2)12.

Parentage. *Haworthia mutica* Haworth x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld.

Comments. Rosette flattish, diameter 85mm, 25 mm high. Leaf number 15, 35 mm long, 15 mm wide, reddish with fine tuberculate spots; leaf margins whitish, slightly tuberculate Fig. 110.

Propagation. Offsets.

×*Gasterhaworthia* 'Revoke' D. Cumming.

Description. Alsterworthia International 7(2)10.

Parentage. *Haworthia koelmaniorum* Obermeyer & D.S. Hardy x *Gasteria carinata* v. *verrucosa* (Miller) van Jaarsveld.

Description. Rosette diameter 140 mm, 50 mm high. Leaf number 12, 55 mm long, 35 mm wide, reddish green with large reddish white/green tubercles, white tinged red.. Fig. 112.

Propagation. Offsets and leaf cuttings.

×*Gasterhaworthia* 'Ripsnorter' D. M. Cumming.

Description. Alsterworthia International 7(1)17.

Parentage. ×*Gasterhaworthia* 'Granlill' Cumming x *Gasteria batesiana* G. D. Rowley.

Description. Rosette diameter 130 mm, 50 mm high. Leaf number 12, 60 mm long, 17 mm wide shiny green with paler green spots in more or less transverse rows, rough serrated edges. Fig. 114.

Note. Larger but not as prolific as sister plant 'Fandango'

Propagation. Offsets.

x*Gasterhaworthia* 'Sabrina' J.A Audissou

Description. Alsterworthia International 2(1)4.

Parentage. *Haworthia longiana* Poelln. x *Gasteria glomerata* E.J. v. Jaarsveld.

Comments. Leaves long as in *H. longiana*. *G. glomerata* contributes the distichous nature of 'Sabrina' and the greater succulence. The leaves of 'Sabrina' are dark green with many, more-or-less concolorous tubercles. Fig. 115.

Propagation: Leaf cuttings.

×*Gasterhaworthia* 'Silky Oaks' D. M. Cumming.

Description. Alsterworthia International. 7(2)10.

Parentage. *Haworthia mucronata* Haworth x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld.

Comments. Rosette diameter 55mm, 40 mm high. Leaf number 20, 30mm long, 20 mm wide, light green with few white spots towards the tip, keeled. Margins white, cartilaginous. Fig. 116.

Propagation. Offsets and leaf cuttings.

X *Gasterhaworthia* 'Simmil' D. M. Cumming.

Description. Alsterworthia International 7(2)13.

Parentage. *Haworthia limifolia* Marloth x *Gasteria* 'Missu Fuji' (Japanese Hybrid).

Description. Rosette non-symmetrical, diameter 100mm, offsetting. Leaf number 14, 50 mm long, 25 mm wide, white ribbing as in some *Haworthia limifolia*. Fig. 117.

Propagation. Offsets.

×*Gasterhaworthia* 'Villonis' D. M. Cumming

Description. Alsterworthia International 7(2)12.

Parentage. (*Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld) x *Haworthia longiana* von Poellnitz) x *Haworthia viscosa* (Linné) Haworth.

Comments. Rosette diameter 60 mm, 50 mm high, forming clumps. Leaf number 10, 30mm long x 10 mm wide, reddish brown/green, minutely tuberculate. Fig. 119. The *H. viscosa* use in this cross is a longer leafed form from the Graaff-Reinet area.

Propagation. Offsets and cuttings.

×*Gasterhaworthia* 'Yambin' D. M. Cumming

Description. Alsterworthia International 7(2)14.

Parentage. *Haworthia minima* (Aiton) Haworth x *Gasteria baylissiana* Rauh.

Description. Rosette diameter, 70 mm, 25 mm high. Leaf number 10, 45 mm x 15 mm, many small white spots, edge serrated. Fig. 121.

Propagation. Offsets and leaf cuttings.

×*Gasterhaworthia* 'Sligrival' D. M. Cumming

Description. Alsterworthia International 7(1)16.

Parentage. *Haworthia granulata* Marloth x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld) x *Haworthia viscosa* (Linne) Haworth . DMC 9060.

Comments. Rosette diameter 30mm, 40mm high, offsetting. Leaf number 7, 15 mm long x 12 mm wide, dark green, surface slightly rough.. Fig. 118. Note. The *H. viscosa* used was a more compact plant than that used in the cross 'Villonis'

Propagation. Offsets and leaf cuttings.

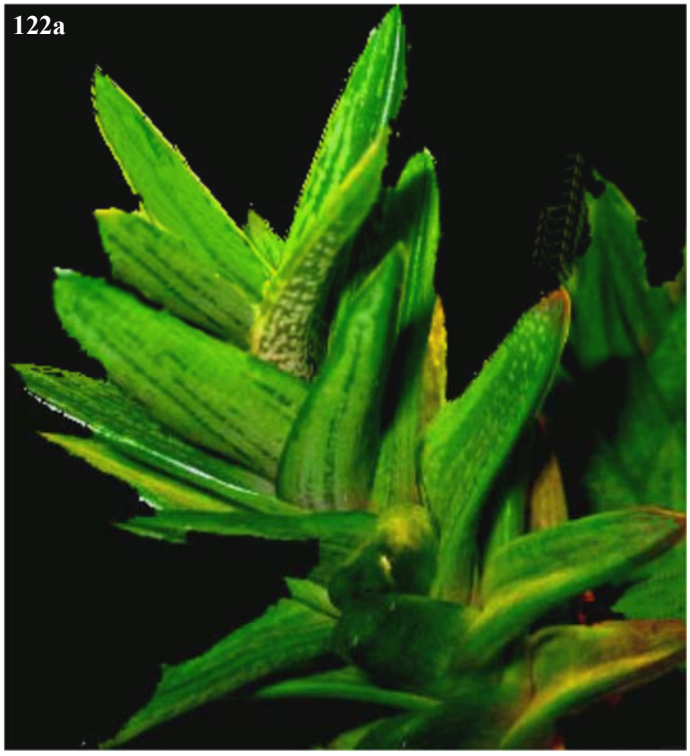
×*Gasterhaworthia* 'Varput' D. M. Cumming

Description. Alsterworthia International 7(2)11 & 9(2)3.

Parentage. *Haworthia variegata* L. Bolus hybrid (ex Dawson & Gill) x *Gasteria bicolor* v. *liliputana* (von Poellnitz) van Jaarsveld.

Comments. Rosette diameter, 100mm, 40 mm high, offsetting. Leaf number 16, 45 mm long, 10mm wide, few small spots, black/ green. Leaves recurved, surface concave. Fig. 120.

Propagation. Offsets and leaf cuttings.


122a


122b

×*Gastroloba* 'Delbat' D. Cumming

Description. David Cumming (the hybridist) 1993 plant list.

Parentage. *Astroloba congesta* x *G.* 'Little Warty' (*G. batesiana* x *G*. 'Old Man Silver')

Comments. Leaves 4-5cm long, 1.5cm wide at the base, about 0.5cm thick, patterned with a dark-green variegation on a pale green background on both surfaces. Rosettes 7-10cm diameter, to 15-20cm tall before lower leaf dieback occurs along the stem. Offsets with differing patterns of variegation. Leaf size and tightness show some variability. Offsets can start off as variegated and revert to non-variegated or have no variegation at all. The non-variegated reversions are interesting in their own right having dark green leaves with pale green spots but fail to comply with David's original description of the plant as a "tall rosette of green/silver leaves". Cultivation conditions may affect colour as shown in the two above photographs, that on the right presumably having had greater exposure to sun. Figs. 122a -b. It grows slowly.

Propagation. Offsets and leaf cuttings.


123

×*Gastroloba* 'Grugwyn' (AKA - 'Gruewyn') D. Cumming

Description. David Cumming (hybridist) 1982 plant list.

Parentage. *Astroloba congesta* x *G*. 'Old Man Silver'.

Comments. This plant looks somewhat like a green variegated *H. marginata* on a stem. It is easy to grow, but slow and it can get largish requiring a 130cm pot. It remains solitary. Leaves are 8-10cm long, 3cm wide at the base, 1-1.5cm thick, tapering, triangular, sharply pointed, smooth/shiny with slightly raised ridges running the length of the leaf. Leaves light green with one or more darker green stripes running down the leaf centres. Leaves become paler with pink flush in the sun. Black spot mars the appearance of older leaves. Leaves remain viable on the stem for 5-7 years before dying and leaving the main body of the plant supported by a stem surrounded by dead leaves, at which time plant beheading becomes sensible. Plant remains solitary, form rosettes 12-15cm diameter and grow to 20-25cm tall before said beheading becomes necessary and in fact the only real way to propagate (apart from leaf offsets). Fig. 123. Flower spikes are solitary 70-90cm long with 50-70 flowers.

Propagation. Beheading and leaf cuttings.

Gasteria Cultivars.


124

***Gasteria* 'Araiso-no-Matsu'**

Description. Not traced.

Parentage. Not known.

Description. Leaves green, warts and ribs opaque, prominent on both surfaces. Reputed to be slow growing, and not particularly stable, consequently leaf patterns can vary from plant to plant. Harry Mak reports that "Araiso" means "rough rocky beach" and "Matsu" means "pine tree'. In Japan pine trees serve as wind breaks. 'Araiso-no-Matsu means "Pine tree forest along rough, rocky beach. Fig. 124.

Propagation. Apparently slow. Occasional offsets/leaf cuttings.

***Gasteria armstrongii* 'Gagyu Nishiki'**

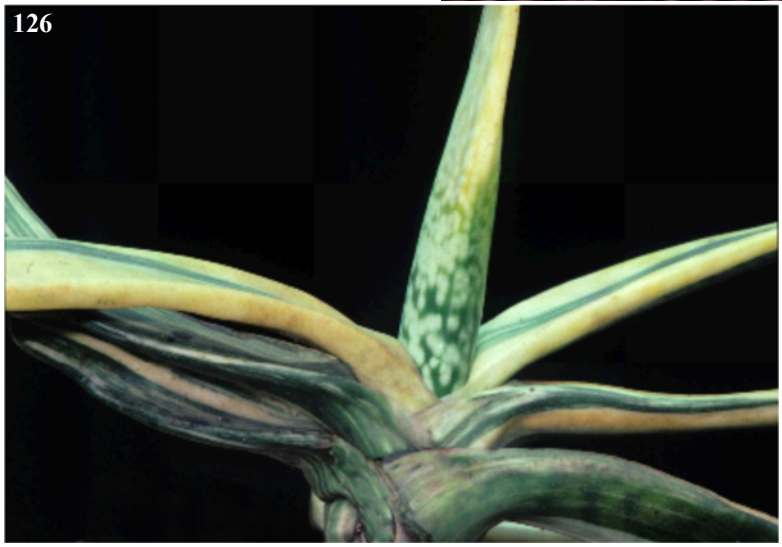
Description. Not traced. Origin Japan.

Parentage. Presumably natural variegation

Comments. Dark to grey green and pale-yellow longitudinal variegation in the species. Fig. 125.

Propagation. Offsets and leaves.


125


126

***Gasteria bicolor* Hayworth var. *bicolor* 'Golden Long Tongue' H.C.K. Mak**

Description. P.A.S.C. Vol. 3.,137

Parentage. Variegated form of a plant from Japan labelled *G. maculata* now classified as *Gasteria bicolor.*

Comments. Longitudinal yellow stripes on leaves ca. 12 cm long and 2-3 cm wide with whitish spots on the leaf under-sides Very slow growing. Fig. 126.

Propagation. Offsets.

***Gasteria* 'Big Brother' D. Cumming**

Description. Presumably a D. Cumming plant catalogue.

Parentage. *G. batesiana* Rowley x *G.* 'Old Man Silver' Hort ex R. Scott. Same batch of seedling as *G.* 'Little Warty'. 1960s.

Comments. The leaves are broad, chunky, predominantly light yellowish green on dark green appearing as stripes of varying thickness. Low tubercles on leaf surfaces and edges. Photo, fig. 127, supplied by D. Cummings of the true clone. Incorrectly named plants are in circulation.

Propagation. Leaf cuttings. Beheading for offsets.


127

***Gasteria batesiana* G.D. Rowley var. *batesiana* 'Sifula' van Jaarsveld**

Description. Aloe 44(4)85.

Parentage. Plants selected from Sifula on the Buffalo River, South Africa.

Comments. Differs from the variety by having particularly fine tubercles.

Fig. 128a shows the cultivar in habitat in South Africa. Fig. 128b is a habitat plant of the species from Sifula in cultivation in South Africa.

Propagation. Offsets and leaf cuttings.

***Gasteria batesiana* G.D. Rowley var. *batesiana* 'Barberton' van Jaarsveld.**

Description. Gasterias of South Africa page 36.

Parentage. Selected habitat plants from Barberton, South Africa.

Comments. This selection has very dark blackish-green leaves with an obtuse apex. Fig. 129 shows a plant in cultivation which has been grown under the staging for lack of space. Prior to removal to under the staging it was mush more blackish-green.

Propagation. Occasional offsets and leaf cuttings.


130

Gasteria batesiana* v. *dolomitica
Van Jaarsv. & A.E. van Wyk
'Inyoka' S. Gildenhuys.

Description. Alsterworthia International 9(2)22.

Parentage. A selected seed grown plant from seed of the original type material obtained from Ernst van Jaarsveld.

Description. Form as for the variety but with ample white markings grouped into broad bands of irregular configuration.. Fig. 130 "Inyoka" = Snake in Zulu language.

Propagation. Offsets and leaf cuttings.


131a


131b

***Gasteria* 'Bronze Knuckles'**
J. Trager

Description. C&SJ 80(3)62

Parentage. A selection of one of a batch of mostly true seedlings from seed harvested at the Huntington Botanical Gardens, USA. Deduced parents *G. bicolor* var. *liliputana* x *G. nitida* var. *armstrongii*

Comments. The glossiness and dwarf, offsetting habit probably results from *G. bicolor* var. *liliputana.* The dark foliage-colour from *G. nitida* var. *armstrongii*. This miniature clumper is deep green in shade but can blush a lovely bronze colour with more light, hence the cultivar name. Figs. 131. The rosettes of recurved leaves are at first distichous but become rosulate.

It was distributed under number ISI 2008-20

Propagation. Offsets.

***Gasteria excelsa* Baker 'Cala' van Jaarsveld.**

Description. Aloe 44(4)89.

Parentage. Selected habitat plants from Cala Pass introduced by Frank Stayner.

Comments. Leaf margins are somewhat wrinkled, not smooth as in the species. Leaf spotting and teeth are prominent. Fig. 132 painting by Jeanette Loedolff.

Propagation. Offsets. Leaf cuttings possible.

***Gasteria rawlinsonii* Oberm 'Stair Case' van. Jaarsveld**

Description. Gasterias of South Africa page 78.

Parentage. Plants introduced by Gerrie Rossouw from an unknown origin in the Baviaanskloof.

Comments. This cultivar has attractive, spirally arranged, distichous leaves almost like a staircase. Fig. 133.

Propagation. Cuttings. Leaf propagation possible but difficult.

***Gasteria batesiana* G.D. Rowley var. *batesiana* 'Pongola' van Jaarsveld.**

Description. Gasterias of South Africa page 36.

Parentage. Selected plants thought to have come from the Pongola valley, South Africa.

Comments. Most often solitary. Leaves very striking, triangular, often recurved, mottled, dark green. Fig. 134 is a young plant in cultivation.

Propagation. Leaf cuttings and occasional offsets.


135

***Gasteria pillansii* Kensit var. *pillansii* 'Ramkop' van Jaarsveld**

Description. Aloe 44(4)94.

Parentage. Selected habitat plants from granite outcrops on the Farm Ramkop (eastern Khamiesberg, Namaqualand).

Comments. An attractive form with broad, patent (spreading) leaves 30-40 mm x 28-33 mm. Appears to have a very slight yellow tinge. Fig. 135.

Propagation. Offsets.

***Gasteria carinata* (Mill.) Duval var. *retusa* 'White Shark' H.C.K. Mak**

Description. Alsterworthia International 2(3)15.

Parentage. A selection of the species collected at De Wet, near Worcester, South Africa.

Comments. As for the species, but the white tubercles in more or less horizontal bands on both leaf surfaces and on the edges are extremely large (shark-skinned). The leaves are arranged in two rows and often undulate when young. Fig. 136. In cultivation the plants grow larger than in habitat. *Gasteria disticha* ISI 1337 is incorrect. It should be amended to *G. carinata* var. *retusa* 'White Shark'

Propagation. Leaf cuttings.


136


137

***Gasteria carinata* (Mill) Duval var. *verrucosa* 'Pink Delight'**

Description. Not traced.

Parentage. A variegated form of *G. carinata* v. *verrucosa* imported by David Cumming from the USA and named by him.

Comments. Leaves dark green with pale yellow/light green longitudinal variegation. In addition, the bases, particularly the lower surfaces, are pinkish. Upper and lower surfaces are covered with pearl-white 1mm diameter raised tubercles, which against the dark background makes them stand out while making the paler background appear even paler. Degrees of variation vary with different offsets. Leaf length varies depending on intensity of light. Fig. 137. The plant is slower growing than the non-variegated species and is sensitive to over watering with root loss being common.

Propagation. Offsets form from short stolons rather than from between leaves.

Gasteria 'Chunky Brother' D. Cumming


138

Description. A David Cumming plant catalogue.

Parentage. *Gasteria batesiana* Rowley x (*G. batesiana* x *Gasteria* 'Old Man Silver' hort ex R. Scott)

Comments. A small plant with chunky, shiny light-and-dark green leaves with whitish variegation. Fig. 138. Grows slowly.

Propagation. Occasional offset, leaf cuttings, beheading.

Gasteraloe 'El Supremo'

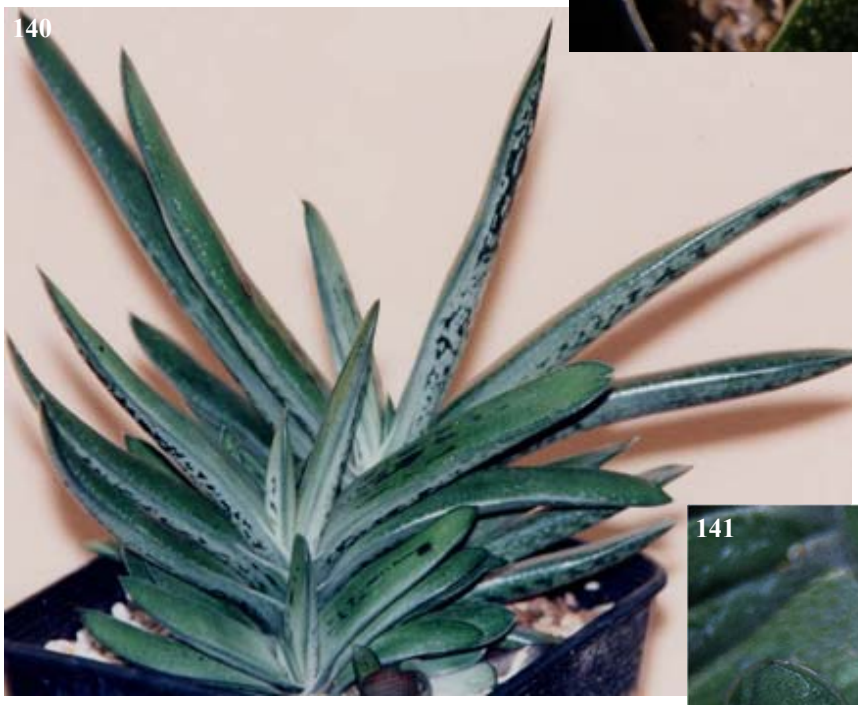

139

Description. Not traced.

Parentage. Frequently circulates as a *Gasteria*, but David Cumming confirms it is a *Gasteraloe* with *Gasteria batesiana* as one parent.

Comments. Leaf with a slight twist, v-shaped in cross section, dark green with scattered white spots, margins white cartilaginous. Fig. 139.

Propagation. Offsets and leaf cuttings.


140

Gasteria 'Fader' hort. ex R. Scott

Description. Haworthiad 12(2)71.

Parentage. ? Probably includes *G. bicolor*.

Comments. Leaves distichous, dark silver grey with dark splashes of green. Smooth and shiny to 200mm long, 25mm wide. Fig. 140. Offsets freely.

Propagation. Offsets.


141

Gasteria 'Frosty'

Description. Not traced.

Parentage. Not traced.

Comments. Leaves are frosty, silver-grey, with dark spots and interrupted lines, normally distichous. Offsets, but slow growing. Long in cultivation. Fig. 141. Distributed as ISI 918 *G. bicolor* 'Frosty' in 1975. Also circulates as *Gasteria obtusa* and *gracilis.* Recorded here as *Gasteria* only in view of the uncertainty of the species.

Propagation. Offsets and leaf cuttings.


142

***Gasteria* 'Fujine Yuki'**

Description. Not traced but of Japanese origin.

Parentage. Not known.

Comments. Leaves dichotomous, white/ ivory with pale yellow which can disappear in winter**.** Fine, green stripes with an occasional broader spotted green stripe. Fig. 142. Offsets reluctantly. Pollen low viability. *G.* 'Fuji Yuki' is similar but leaves are not pointed, streaking on top surface only, offsets more freely, faster growing,

Propagation. Offsets and leaf cuttings.

***Gasteria* 'Gagyu Ryu'**

Description. Not located.

Parentage. Not known.

Comments. A Japanese hybrid. Dark green leaf with the edges or thereabouts white. Fig. 143. Gagyu means "Laying Dragon".

Propagation. Offsets and leaves.


143


144

***Gasteria*(?) 'Green Spiral'**

Description. Not traced.

Parentage. Unknown. Origin USA?

Comments. Leaves uniform dark green 2.5-3cm wide, 10-12cm long, about 1cm thick. In stronger light leaves around 7cm long. Smooth without tubercles, curve downwards, distinct central channel. Distinct stem, slow-growing green-spiral, does not seem to offset. Mid-late summer about 30 distinctly tricoloured (pink-white-green), 2.5-3cm long flowers almost tubular, on a single flower stem about 100-120cm in length. Fig. 145.

Propagation. Beheading to promote offsets and leaf cuttings.

***Gasteria* 'Giant Fuji'**

Description. Not located.

Parentage. Not traced.

Comments. Origin Japan. Leaves distichous, whitish spots and white longitudinal striations, some longitudinal blackish green striations. Overall appearance grey-green background with much white. As plants get larger they develop a yellow tinge. Fig. 144.

Virtually identical to *Gasteria* 'Fuji Yuki'. Probable difference - 'Fuji Yuki' offsets tend to yellow while young.

Propagation. Offsets.


145


146

Gasteria 'Ilibarty' Russell Scott

Description. Alsterworthia International 5(3)14

Parentage. (*Gasteria bicolor* v. *liliputana* x *Gasteria batesiana* v. *batesiana*)♀ x *Gasteria* 'Little Warty'♂.

Comments. Small, similar to *G. bicolor* v. *liliputana* with the green-variegation patterns of *G.* 'Little Warty'. Leaves distichous, but can curl in various directions, sideways, inwards and outwards, 8-10cm long and around 1cm wide, upper surface covered in pale green spots (slightly raised tubercles) against a dark green background. More often than not these join up to form prominent lines running the length of the leaf. Leaf edges pale green. The underside of the leaf has a similar pattern and colouration near the leaf tips, but the rest of the leaf has pale spots (not tubercles) against a dark green to brown background. Fig. 146.

Propagation. Offsets.


147

Gasteria 'Little Warty' D. Cumming

Description. 1982 David Cumming plant list. *Gasteria* 'Limeade' P.A.S.C. Vol. 3, p. 136 is invalid - same cultivar.

Parentage. *Gasteria batesiana* x *Gasteria* 'Old Man Silver'. Same batch of seedling as *Gasteria* 'Big Brother'.

Comments. Leaves dark green, many random, silver-grey spots sometimes forming horizontal &/or longitudinal bands, sometimes forming dense aggregates of silver-grey. Fig. 147. Distributed as ISI 91-45. *Gasteria* 'Ultimate Brother', a back cross of *G.* 'Big Brother' to *Gasteria batesiana* is similar to 'Little Warty'

Propagation. Offsets.


148

Gasteria armstrongii 'Yellow Cow' (H.C.K. Mak) Mays

Description. P.A.S.C. Vol. 3 as *Gasteria nitida* v. *armstrongii* 'Yellow Cow'. As *armstrongii* has now been reinstated as a species (Aloe 44(4)87) following DNA investigations, the correct name is now *Gasteria armstrongii* 'Yellow Cow'.

Parentage. Variegation in the species originating in Japan.

Comments. Leaves dark-green with longitudinal, yellow variegation tinged pink. The variegation is typically broad at one side of the leaf with a few striations in the green. Fig. 148. Very slow growing.

Propagation. Offsets.

149

***Gasteria* 'Old Man Silver' hort ex R. Scott**

Description. Haworthiad 12(2)69

Parentage. Possible origin *G. bicolor*.
Comments. Leaves slightly rough, dark green with random silver spots, sometimes coalescing and silver blotches and striping. Fig. 149. Under stress may develop reddish tinges. Offsets, but not all variegated. It has been used frequently to create other hybrids.

Propagation. Offsets.

150

***Gasteria* 'Perfection' H. Mays**

Description. Alsterworthia International 9(3)24. Originally published as *Gasteria* 'Perfectus' in Haworthiad 12(2)69. Perfectus is a Latin word. Art. 19.13 of the ICNCP prohibits the use of Latin in cultivar epithets, except in certain circumstances which do not apply.

Parentage. *Gasteria* (*armstrongii* cv. ?) x *G.* 'Old Man Silver'.

Comments. Ascending, pale, silver-green leaves with distinct dark green leaf edges; short, apical point sharp. Scattered greyish white spots and tubercles with tubercles lining the leaf edges. Fig. 150. Offsets freely.

Propagation. Offsets.

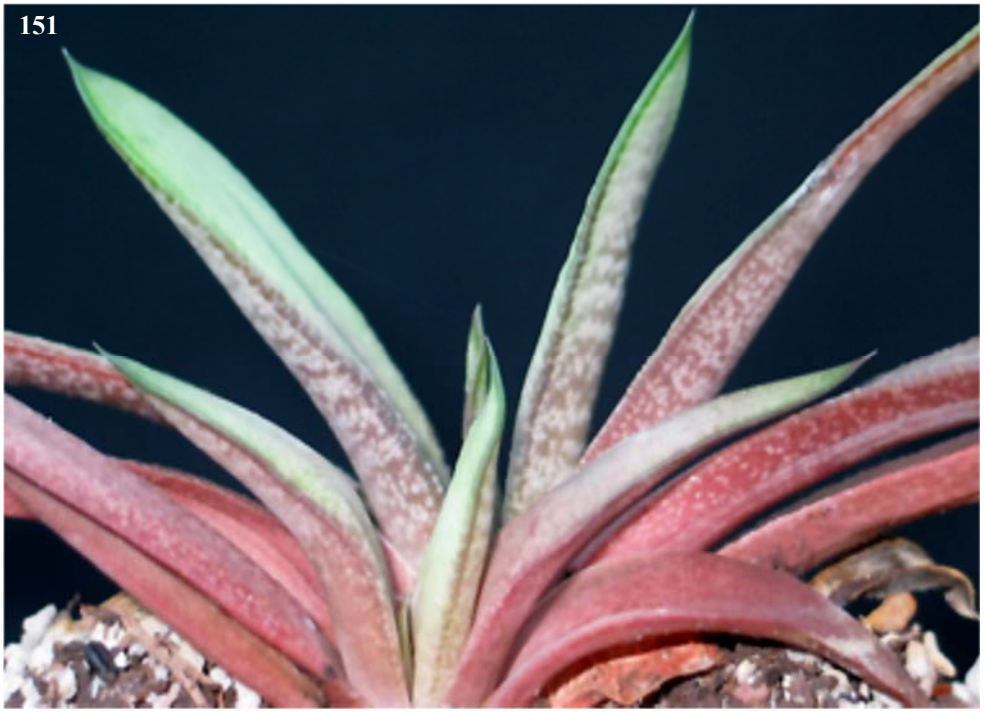
Gasteria 'Perfell' Russell Scott

Description. Alsterworthia International 5(3)14-15

Parentage. *Gasteria* 'Perfection' ♀ x *Gasteria ellaphieae* ♂.

Comments. Slow growing, offsets slowly. Distichous in its juvenile stage with flat leaves to 15 cm long. Mature rosette has triangular leaves reduced to around 8cm long. The top surface of the leaf is pale green with dark green edges, fig. 145a. The lower surface can turn a pink-red colour. Both surfaces can be covered in white spots, which are hard to distinguish on the upper surface, but contrast highly with the pink/red colouration of the lower surface (Fig. 151). They can form prominent bands on the lower leaf surfaces. There are no obvious tubercles although they can be felt along leaf edges and near the leaf tips.

Propagation. Offsets and leaf cuttings.


151


152

Gasteria 'Platinum'

Description. Not traced.

Parentage. Not traced.

Comments. Young leaves silvery changing to pale-green with age, faintly spotted white. All leaves with a few dark -green longitudinal, interrupted stripes. Fig. 152.

Propagation. Offsets and leaf cuttings.

Gasteria 'Royston's Fan' H.C.K. Mak

Description. Haworthiad 14(1)9-11.

Parentage. Not certain. Most likely *Gasteria disticha,* but possibly *Gasteria nitida.*

Comments. Very stable, multidirectional, cristate showing no signs of reversion. Can be grown in shade or bright light. Latter produces more compact and richer coloured plants (reddish). Leaves dark green, mostly not keeled, obtuse to truncate, mucronata, dense white spots in irregular transverse bands. Fig. 153. Rather quick growing.

Propagation. By simple division of the crest with a sharp knife and leaf cuttings which produce cristate plants,


153

154

***Gasteria* 'Shinano Fuji'**

Description. Not known. Possibly *G. gracilis* v. *minima* a name no longer recognised. *Gasteria* 'Old Man Yellow' is a duplicate, invalid name.

Comments. Origin Japan. Offsets prolifically but many non-variegated. Smallest of the yellow variegated gasterias. Leaves dark green with variable amounts of yellow and small pale spots. Distichous, rarely rosette. Fig. 154.

Sometimes distributed as *Gasteria minima* variegated and *Gasteria liliputana* variegated.

Propagation. Offsets. Green offsets may produce variegated offsets.

155

***Gasteria* 'Silver Star' hort. ex R. Scott**

Description. Haworthiad 12(2)71.

Parentage. *Gasteria liliputana* x *Gasteria* 'Old Man Silver'.

Comments. Leaves silver green, prominent dark makings. Often plants are distichous to slightly spiral with many offsets and leaves to 3.5cm. Alternatively leaves in a staircase type spiral, longer leaves to 10cm, fewer offset, removal of which promotes the spiral. Fig. 155. Originated USA? *Gasteria* 'Torque' is similar in leaf pattern and colouration but chunkier and slightly larger with fewer offsets.

Propagation. Offsets.

156

***Gasteria* 'Silver Toad' Hummel ex R. Scott.**

Description. Haworthiad 12(2)71 is the earliest traced so far.

Parentage. Not known.

Comments. Distichou**s.** Leaves are very tuberculate, pale silver-grey, which predominates, on a dark green background. Offsets freely. A small, clumping plant about 7cm tall. Fig. 156.

Originated with Ed Hummel, USA. *G.* 'Hummel's Silver' is similar but the leaves are somewhat longer, have more dark green patterns and a slight sideways twist.

Propagation. Offsets.


157

Gasteraloe 'Silver Torch'

Description. Not traced.

Parents. Commonly circulates as a *Gasteria*, but David Cumming confirms this is a *Gasteraloe*. *Gasteria* parent most likely 'Little Warty'. Similar plants are in circulation incorrectly as gasterias. Most were created by David Cumming.

Comments. Leaves narrow lanceolate, terminating in a mucron, leaf edges are cartilaginous, prominently white. Leaf colour dark green spotted white. In strong sun the green turns reddish brown. The plant in fig. 157 was resident at Kirstenbosch, South Africa.

Propagation. Offsets and leaf cuttings.


158

Gasteria 'Smokey' hort ex H.C.K. MAK

Description. P.A.S.C. 137

Parentage. Unknown.

Comments. Long in cultivation in the U.K. Whitish, short distichous leaves 3-4 cm long 1.5-2 cm wide with occasional deep green patches/stripes on both sides. Slow growing, gradually offsets. Fig. 158.

Propagation. offsets.


159

Gasteria carinata (Mill) Duval v. *verrucosa* Jaarsveld 'Silver'

Description. Not traced.

Parentage. Circulates mainly as *G. verrucosa* 'Silver', but as *verrucosa* is considered to be a variety of *G. carinata* the correct name is *G. carinata* v. *verrucosa* 'Silver'

Comments. Leaves narrowly lanceolate ending in a mucro, dark to blackish green, white tubercles in groups of varying shape, which give the plant a silvery-white appearance. Fig. 159.

Propagation. Offsets.


160

Gasteria 'Cream'*

Description. C&SJ 72(1)9 as *G. gracilis* v. *minima* 'Cream Kodakara' but Kodakara = *Gasteria gracilis* v. *minima* and must be removed. No earlier description has been traced.

Comments. Small rosettes branch freely. Leaves light green. Margins cartilaginous. Leaf surfaces with scattered white spots. The few longitudinal, interrupted, blackish green lines are prominent. Fig. 160. An old Japanese cultivar - pre World War II.

Propagation. Offsets.

Gasteria 'Satsusatsu-no-Matsu'*

Description. C&SJ 72(1)10 earliest traced.

Comments. Leaves relatively thin with a tendency for leaves to curl inwards and backwards, blackish-green with grey-green to white variegation longitudinally distributed, terminal spines light brown to white, margins cartilaginous. Fig. 161. Offsets freely

Propagation. Offsets.


161

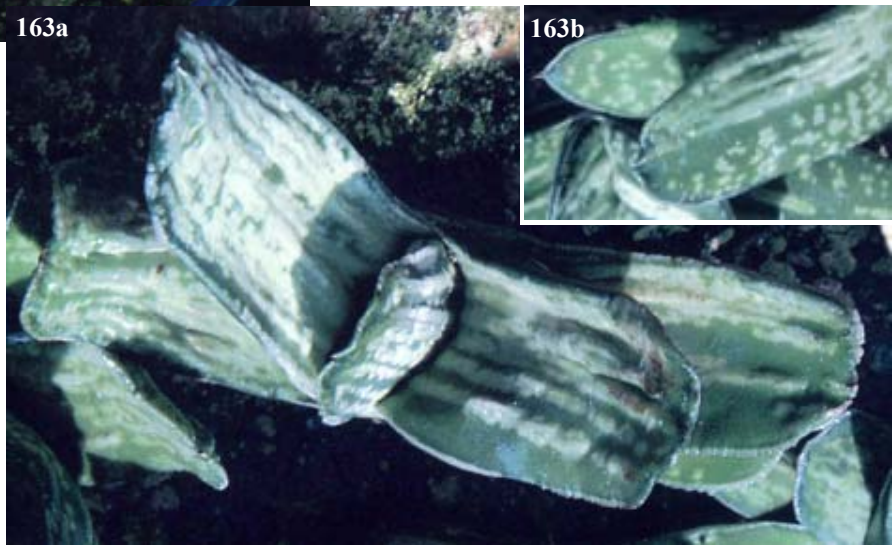

162

Gasteria 'Zouge'*

Description. C&SJ 72(1)8-9 as *Gasteria gracilis* v. *minima* 'Zouge-Kodakara. Kodakara must be removed. Earliest traced description.

Comments. Predominantly pale yellow with sparse dark or light green variegation. The leaves can be long and taper gradually to terminate in a spine rather than with a more rounded leaf end with terminal spine as in other cultivars of the same parentage. Fig. 162. Hybrid genes cannot be ruled out.

Propagation. Offsets.


163a

163b

Gasteria 'Isomatsu Nishiki'*

Description. C&SJ 72(1)10.12. Earliest traced.

Comments. Leaf ends may be blunt, irregular and without spines though some may be normal. Portions of leaves may be spotted normally but major parts have separate or coagulating creamy white spots in lumpy longitudinal lines. Figs 163.

Propagation. Offsets.


164

Gasteria 'Beni-surusumi-nishiki'*

Description. C&SJ 72(1)11 as *G. gracilis* v. *minima* 'Beni-surusumi -Kodakara-nishiki' but Kodakara must be removed. Earliest traced description.

Comments. The leaves are a shadowy, pale green; margins are horny, cream. One or a few medium to dark green longitudinal stripes appear on both the upper and lower leaf surfaces. The leaf ends are rounded with a short spine. It freely produces offsets. Fig. 164.

Propagation. Offsets.

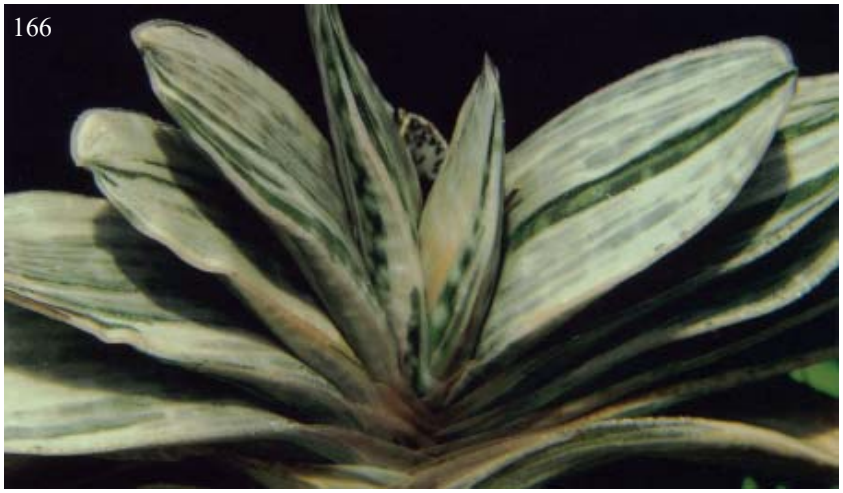

165

Gasteria 'Seiha-Nishiki'*

Description. C&SJ 72(1)11. Earliest traced.

Comments. Leaves dull green with greyish longitudinal stripes of varying width. Some spots are in the form of distinct tubercles. Fig. 165.

Propagation. Offsets and leaf cuttings.


166

Gasteria 'Sakura Fuji'*

Description. C&SJ 72(1)12. Earliest traced.

Comments. Leaves are cream with touches of pale yellow; longitudinal stripes foggy-grey plus a few blackish-green stripes on both surfaces. Fig. 166.

Propagation. Offsets and leaf cuttings.


167

Gasteria 'Hakuba-no-Kagayaki'*

Description. C&SJ 72(1)12. Earliest traced.

Comments. Leaves taper to a point with a black spine, grey with many scattered, grey tubercles and a few narrow to broad, blackish green stripes. Leaf margins lined with a row of grey tubercles. Fig. 167.

Propagation. Offsets.

***Gasteria* 'White Ghost'**

Description. Not traced.

Parentage. Recorded as a cultivar of *Gasteria gracilis* v. *minima*, a rejected species name.

Comments. Rosette small, distichous, offsetting to mound clumping. May be a white reversion of the yellow variegated *Gasteria* 'Zouge-No-To or *Gasteria* 'Shinano Fuji'. Leaves to 20mm wide, 40-50mm long. Upper surface predominantly white with grey, occasionally blackish grey, streaking. Lower leaf grey-green, white spotted with slight streaking towards the leaf tips and edges. The majority of the white appear on the top surface . Fig. 168.

Propagation. Offsets.

***Gasteria* variegated**

Parentage. HBG 77313. *Gasteria gracilis* variegated, but The Illustrated Handbook of Succulent Plants - Monocotyledons records the name as "unresolved application". Therefore, here recorded as *Gasteria* only.

Comments. Leaves dull, dark, grey-green with greyish spots, aggregations of spots and longitudinal white to off-white stripes. Distichous at first then rosette forming. Figs. 169. Offsets variable, produced at the base, in leaf axils and on flower stems - fig. 27 page 16.

Propagation. Offsets.

*In the C&SJ 1972:1 the cultivars in figures 160 - 167, pages 72-73 are all recorded as cultivars of *Gasteria gracilis* Baker (1880 for a living plant for which a specimen was not preserved). The Illustrated Handbook of Succulent Plants - Monocotyledons and Ernst van Jaarsveld's Gasterias of South Africa record that *Gasteria gracilis* is of unresolved application, consequently it is not recognised as a species.

Article 19.1 of the I.C.N.C.P. require that "The name of a cultivar is the correct name of the genus or lower taxonomic unit to which it is assigned together with a cultivar epithet." It follows that as the specific epithet *gracilis* has no application it must be eliminated from these cultivar names. The cultivar names are now made up of the genus name and the cultivar epithet.

All these cultivars are very old Japanese creations, which predate the article in the USA journal of 1972. So far it has not been possible to trace the original descriptions. The C&SJ 72:1 has been recorded for the time being as the original descriptions. Perhaps in due course the original Japanese published descriptions will be found?

Index of Cultivar Names*

Index of Scientific Names

Aloe Hybrid Cultivars with Formula Names.

* The correct cultivar epithet (name) under the International Code of Nomenclature for Cultivated Plants is the same throughout the world. Species names to which cultivar epithets are attached may, however, differ because different people use species names from different classifications. To make it easier to locate a cultivar epithet, they are listed in the index in alphabetical order without a species name. If the species name you use is different from that used in the body of this publication, because it is taken from a different classification, you simply substitute the species name you use for the one used in this book, but please note that a cultivar epithet may not duplicated one already in use in the genus/nothogenus to which it is re-assigned. If it does another name must be given to it (ICNCP Art. 19.5).

Scientific names used in this publication are listed separately.

Acknowledgement.

The editor is indebted to the following for invaluable assistance in the form of information and/or photographs: Soumen Aditya, Jean-Andre Audissou, D.M. Cumming, Dr. P.I .Forster, J. Frew, Sean Gildenhuys, Dr. M. Hayashi, Dr. A. Leslie, Harry Mak, Kotie Retief, Gordon Rowley, Russell Scot, John Trager, Josef Verhoven and Dr . C. Whitehouse.

Many others have contributed in different ways with assistance in the form of suggestions and clues etc which have helped in tracing and influencing the end product.

To everyone I express my sincere appreciation for the assistance they have freely given.
Final responsibility for what is published is, however, mine.

Harry Mays

Alsterworthia International
Cultivar Project

Coordinator & Editor
Harry Mays
Woodsleigh, Moss Lane,
St Michaels on Wyre,
Preston,
PR3 0TY,
UNITED KINGDOM.

E-mail: hmays@freenetname.co.uk

This publication is based on information
provided both by Alsterworthia International members
and non-members world wide
without whose assistance it would
not have been possible.

ISBN 978-0-9552726-3-9