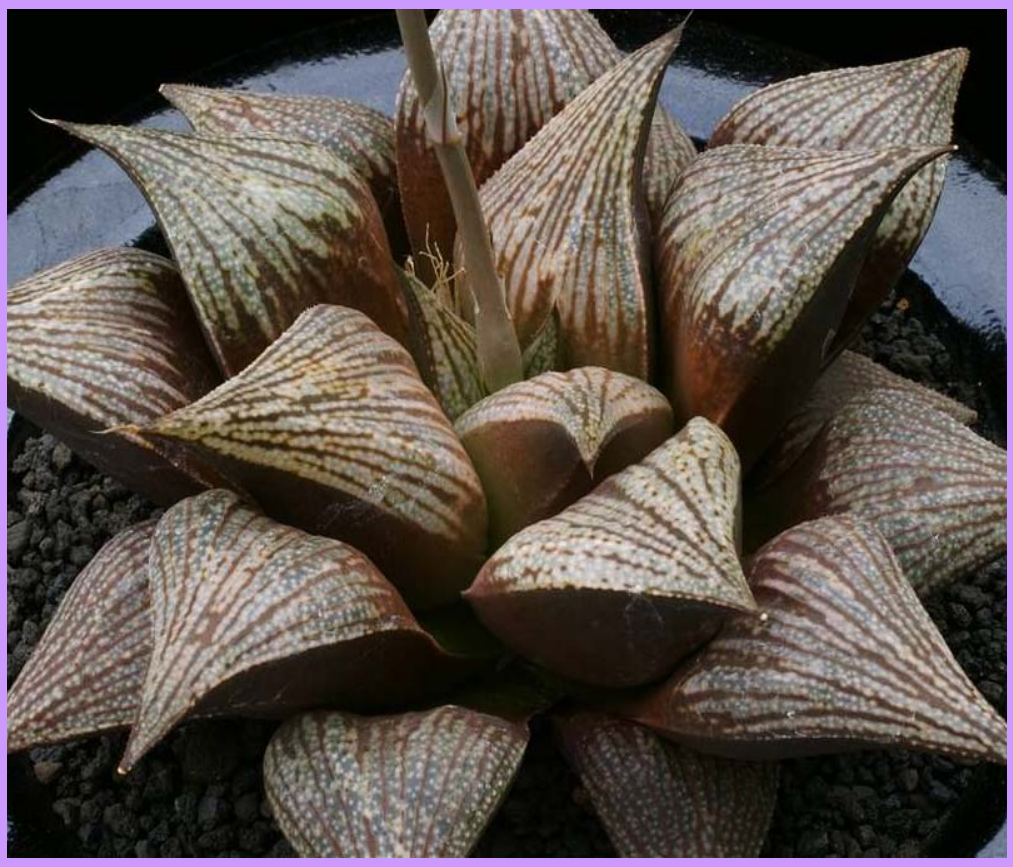
ALSTERWORTHIA INTERNATIONAL

THE SUCCULENT ASPHODELACEAE JOURNAL

The journal of the Haworthia Society of Japan
Haworthia Study
English Edition

No. 27 (Aug. 2012)



'Dream' (Picta Dan) Diameter: 14 cm, leaf width 3 cm. Breeder/Author : Mr. OZAWA, Naoki
One of Mr. Ozawa's masterpieces, such as 'Chatarei', with distinctive thick brown lines on the white-flecked window. Line pattern is the same as 'Chatarei', but bigger than that. As great as 'Da Vinci' in Brown Picta series. Very unique markings.

Contents.

Volume 15 **Issue 3. November 2015** **ISSN: 1474-4635**

Alsterworthia International.
Extension of Services and Membership Renewal for 2016.
Editor: Harry Mays BSc, BA (Honours), Member IOS.

Woodsleigh, Moss Lane, St Michaels on Wyre, Preston, PR3 0TY, U.K.
Tel: U.K: 01995 679295, Overseas: +44 1995 679295. E-mail: hmays@freenetname.co.uk

Introduction.

At its inception, payments to Alsterworthia International were primarily in local currency to local honorary representatives. We are grateful to all the representatives who assisted in getting Alsterworthia International off to a good start and kept it flourishing; but times change. The greatest innovation was the expansion of the online money transfer services of PayPal, which use current exchange rates, not the fixed rates used by Alsterworthia. PayPal exchange rates and charges are considerably less than those of banks. Services are much faster and available 24 hours per day. PayPal became popular, not only with many members, but also with representatives. Other factors which became relevant were the unbelievable increases in postal charges and the expansion of free on line journals, with or without a printed version. Being free, they attracted a wider readership than printed only journals. Adapting to changing times is necessary to ensure continued success.

Extension of Alsterworthia International Services.

Alsterworthia International journal. *In addition to the **printed version,** an **on line copy will be published** and available to everyone for downloading **free of charge***. The printed journal will ensure that new cultivars/species comply with the provision of ICNCP/ICN for Algae, Fungi and Plants.

Alsterworthia International back issues are being put on line for down-loading **free of charge**.

An English Translation of Haworthia Study, the journal of the Japanese Haworthia Society, will be published by Alsterworthia International commencing with Number 27, August 2012. **No additional charges for this service** as the English translation of Haworthia Study will be published with Alsterworthia. The readership should extend to people whose secondary language is (not perfect) English **at no cost to them**.

The International Cultivar Registration Authority (The Haworthia Society of Japan, Registrar: Dr. M. Hayashi) for Haworthia (including Haworthiopsis & Tulista), Astroloba and Chortolirion, **has appointed Harry Mays** their representative for the Western World. All posts are honorary.

Membership Fees for the printed journal Alsterworthia International.

UK = £14.00, rest of the world £18.00, surface postage included.

Payments in *British pounds only* please:

1. by PayPal to: alsterworthia@freenetname.co.uk

2. by Bank transfers to: Santander, account Alsterworthia International. Account number 75923083. Sort Code 090155. BIC: ABBYGB21XXX. IBAN: GB8OABBY09015575923083.

3. by cheques, bank drafts payable to "Alsterworthia International" - please send to:
H. Mays, Woodsleigh, Moss Lane, St Michaels on Wyre, Preston, PR3 0TY, UK.

4. For Australia and Belgium only, Please see enclosed leaflet.

Online journal Alsterworthia International: free to everyone.

For access go to **https://alsterworthia.wordpress.com/** and click on **"Journals"** at the head of the page.
Please send your e-mail address to Harry Mays, hmays@freenetname.co.uk if you would like him to tell you when a new publication is add to https://alsterworthia.wordpress.com/

Acknowledgements
Lawrence Loucka for advice, arranging the Wordpress site and installing the published material.
Dr M. Hayashi & the Haworthia Society of Japan for permission to translate Haworthia Study into English and for inviting me to be their representative for the western world for their International Cultivar Registration Authority.
Yuichi Murayama for undertaking the translation of Haworthia Study.
It would not have been possible to undertake these additional services without their expert assistance.

Haworthia Study - Published by the Haworthia Society of Japan.

Editor: Dr M. Hayashi.

E-mail: info@haworthia.net Homepage: http://www.haworthia.net

General Information.

Haworthia Study (Japanese) continues to be available world wide direct from the Haworthia Society of Japan.

Similarly, printed back issues of Haworthia Study (Japanese) will also be available from the Japanese Haworthia Society.

Please send orders for these journals as outlined below.

Cost of the journal Haworthia Study (Japanese) outside Japan.

The yen equivalent of £20.00 plus postage from Japan, which is destination dependent.

Payments in *Japanese Yen* only please:

by PayPal: direct to < m-hayashi@nausica.jp >

Ordering procedure.

1.Send your order with your name and address to Harry Mays hmays@feenetname.co.uk

2.He will advise you of the total sum due in Yen.

3. Make payment by PayPal direct to m-hayashi@nausica.jp

4. Haworthia Study (Japanese) will be sent to you direct from Japan when payment is received or when the journal is published if later.

The International Cultivar Registration Authority for Haworthia (including Haworthiopsis & Tulista), Astroloba and Chortolirion is The Haworthia Society of Japan, Registrar: Dr. M. Hayashi.

Harry Mays, editor, Alsterworthia International is their appointed representative for the Western World.

Both the Japanese Haworthia Society and Alsterworthia International are willing to print details of new cultivars in their journals - in Japanese in Haworthia Study, in English in Alsterworthia International. If you have new cultivars to publish and wish to ensure that they comply with the International Code of Nomenclature for Cultivated Plants please contact Dr. Hayashi or Harry Mays as appropriate.

For information about this ICRA please go to the official web site < http://www.haworthia.net >.

The language relating to the completion of forms for the registration of cultivars is also in English.

No central records exist for cultivars which have already been published, consequently it is necessary to compile world wide lists for all cultivars published to date. Dr Hayashi is busily compiling list of cultivars published in Japanese and Harry Mays is doing the same for cultivars published in English. We both need assistance to speed up the processes. Would you please help by providing details of both old and new cultivars published in print to Dr Hayashi or Harry Mays as appropriate?

If you could send a copy of the original description that would be excellent.

Faces of Haworthia retusa.

Photographs: Bruce Bayer. Comments: Harry Mays.

Kruisrivier. MBB 7999.1

Kruisrivier. MBB 7999.18

Kruisrivier. MBB 7999.20

Kruisrivier. MBB 7999.5

Note the shape of the leaves, particularly the retuse ends.

MBB 7999.1 short and broad with slightly outward curved edges, MBB 7999.18 longer and narrower with notably longer straighter edges, MBB 7999.20 with a narrow end, broad base rapidly narrowing with length and MBB 7999.5 slightly twisted to on side with an incurved edge on that side.

Note also the leaf colour.

MBB 7999.1 dark green, MBB 7999.18 a somewhat lighter green

MBB 7999.20 light grey-green, MBB 7999.5 notably blueish-green.

Natural variation in a species ⟵ (it depends on how you define a species) ⟶ Emergence of different species

Bad Boy Beauties - Part 3.

Seven new Haworthia Cultivars from India.

Soumen Aditya. Photographs: Soumen Aditya.

There has been a lapse in publishing new *Haworthia* cultivars because F2 & F3 hybrids take a long time to reach perfection, but I can now publish a few more very nice *Haworthia* cultivars from India. It has not been so easy to achieve these results because of bad climatic conditions over the last few years; they have caused seed pods to fail and many seedlings have succumbed to fungal infection. I have back crossed my few, old cultivars with some species and also with other cultivars. I have many seedlings without great features! I now name some of the outstanding ones with names of friends or names that just occurred to me in my dreams.

1. *Haworthia* 'Bela-Rani-Atasi'.

Parentage. A selected clone from an open pollinated batch of seed of *Haworthia magnifica.*

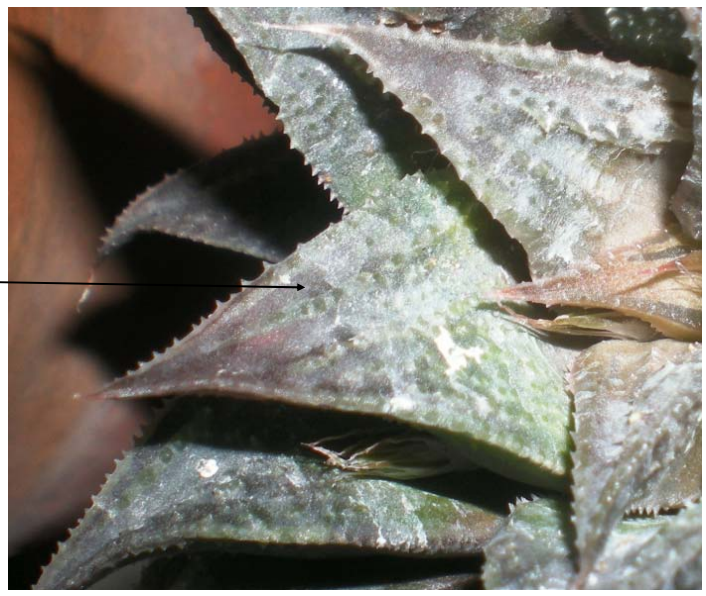
Description. Rosette compact in the form of a spaced, five-spiral stack, slow growing. Leaves turgid, recurved, not retuse, slightly curved to one side at the windowed upper part, tapering to a prominent, brown, terminal spine which becomes blunt with age; upper windowed surface white, scattered spines some in more or less longitudinal rows, overall white haze, fine, scattered, white spots, but less prominent at leaf tip; central, longitudinal channel; underside rounded, but much less so at the leaf end where the thickness of the leaf decreases as the end recurves, overall white haze and white spots less intense than on the upper side. Base colour of the leaves is dark green which turns dark black in summer; with age the very oldest leaves at the base lose their white haze and the white colour of the teeth and become concolorus with the leaf. Marginal teeth small, spaced, white. Flowers from the axils of the lower leaves.

Name. A dreamt up name.

Propagation. Leaf cuttings.

The white haze is formed by many tinny, random, white spots embedded in the surface tissue of the leaves.

The denser, white patches are made up of more numerous, tinny, white spots. Different densities of spots account for the different intensities of white haze and solid white areas.



As new growth occurs at the top centre of the rosette the lower leaves loose the white haze and the whiteness of the surface spines, which become concolorus with the leaves, in advance of the leaves drying out. The brown, dried up remains of an old leaf can be seen at lower centre.

Spirals are compact leaving notable space between them.

2. *Haworthia* 'Apu'.

Parentage. *Hawothia* 'Debashis-Samarpita' ♀ x [(*Haworthia bayerii* x *Haworthia emelyae* var. *major*) x *Haworthia pygmaea*]♂.

Description. Rosette small, flattened but slightly open, grows slowly. Leaves turgid, retuse upper-leaf end, pellucid window divided by up to six longitudinal, white lines of variable length; dense, rounded, granular, whitish tubercles fill the glossy, grey-blue windows, which overhang the boarder, like dew drops, between the window and upper leaf lower surface. Leaves blackish-brown throughout the year with portion below the window, very dark blackish-brown. Variegation is confined to the edges and backs of some leaves and to windows in the retuse leaf ends; it is made up of elongated, variable, white patches with diffused pink below and a red stripe to one side or the other and white irregular patches in the windows. Leaf margins with very small, fine, whitish teeth. Brown terminal spine, but only on some leaves.

Name. Named after my elder brother, the late Tapas Basu, who died early in 2010 from cancer.

Propagation. Leaf cuttings.

Retuse leaf ends make for a more compact plant as they fit together nicely rather than the tiered, stacked leaves of *Haworthia* 'Bela-Rani-Astasi', which has recurved leaves.

The term "Retuse" needs some explanation. Books on botany define "Retuse" as "With rounded shallowly notched end" (Botanical Latin Stearn, Glossary of botanical terms Eggli, Plant Identification Terminology Harris, Glossary of Succulent Plat Terms Marshall and Woods, Webster's Third International Dictionary etc), which clearly does not apply to this cultivar. However, Eggli records the following definition "Sometime also used instead of truncate" and "Truncate = with a strait tip or base which is about 90° to the long axis". Truncate has in fact been used to signify the flattish, bent back windowed end of an haworthia leaf for some considerable time and will continue to be so used. A curved leaf with a windowed end is not retuse; it is recurved.

Note the leaf ends without a terminal spine may be more rounded than those with a terminal spine.

3. *Haworthia* 'Jagadish-Abala'.

Parentage. *Haworthia* 'Shanker' ♀ x *Haworthia emelyae* var. comptoniana ♂.

Description. Rosettes large 4"+ (10+ cm) in diameter. Young leaves vertical, older inclined outwards, resulting in an open rosette; retuse windows vivid, light-green with up to circa 10 thick, white lines which change to dark-reddish-brown as the leaves age. Random white dots are present and thin, white lines may connect the longitudinal lines to a lesser or greater extent, even to reticulation. The longitudinal lines divide the window into short to long finger like projections at the base. Leaf margins have spaced, fine, small teeth generally pointing backwards. The very short, brown, terminal spine is twisted to one side. Leaf colour dark, reddish-brown.

Name. Named after the great Bengali scientist Dr. Jagadish Chandra Bose and his wife Mrs. Abala Bose.

Propagation. Leaf cuttings.

The windows fill the whole of the retuse leaf ends. The change to dark red of the circa 10 thick, white lines as the leaves age can be clearly seen in the sequence of the leaves, as can the somewhat hazy and variable number of thin, white lines. As the laves age the green begins to darken.

It is likely that the intense sun in the Indian summer is responsible for colour change.

The retuse ends of the young leaves are about 90° to the vertical leaf upper surface gaining maximum sunlight. As the plant grows, the leaves move outwards and downwards towards the base of the rosette where light intensity is more reduced, if not obliterated. As the leaves age, the angle between the retuse end and leaf upper surface declines. In old age they are compressed by the downward pressure of the growing leaves above and eventually die as new growth takes place at the central growing point.

4. *Haworthia* 'Nilanshu'.

Parentage. *Haworthia* 'Shanker' ♀ x *Haworthia emelyae*. var. *comptoniana* ♂.

Description. Rosette large, compact. Young leaves medium green, darkening with age to dark-green; windows are subacute, the two sides meeting at less than 90° where the leaf ends in a short, brownish twisted point. The angle of inclination of the window to the vertical leaf face approaches about 90° resulting in a thick, turgid leaf. One keel per leaf with small, white teeth; margins with small, white, backward pointing teeth. Windows are lined with circa 12 thick, longitudinal, white lines reticulated by somewhat thinner white lines in the lower portion. On old, lower leaves the white lines turn dark reddish brown. The upper surface of leaves, particularly in the retuse area, have hazy patches of white plus some solid white irregular areas. The under side of the leaves above the junction with the retuse ends have small numbers of irregularly dispersed short, white lines and dots.

Name. Named after my friend Dr. Nilanshu Das.

Propagation. Leaf cuttings.

The nature of Haworthia leaves correlates with the overall form of the plant and vice versa: at one extreme leaves with retuse upper ends of some 90° to the vertical tend to fit tightly together to form a compact rosette set low in the ground, whereas those with a much increased angle form more open rosettes.

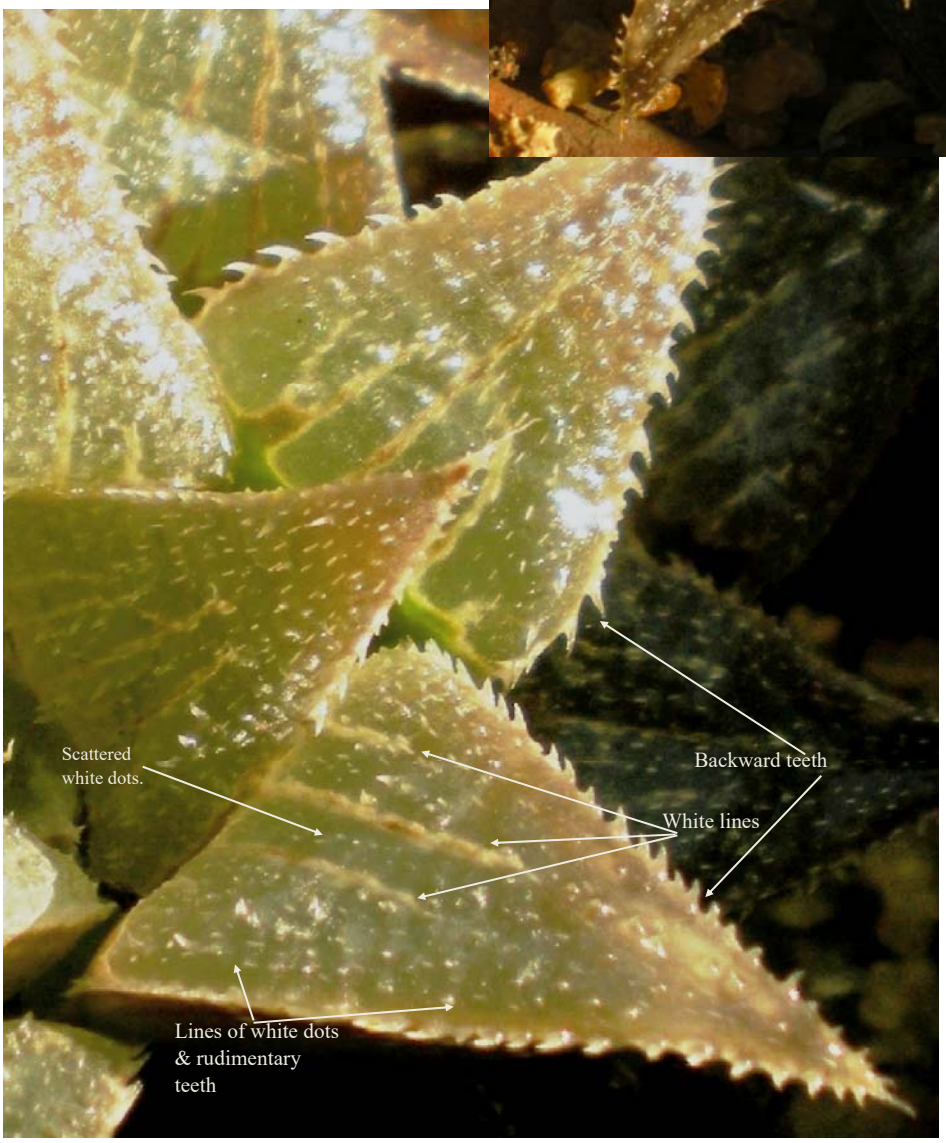
Those with recurved leaves fit together better when stacked one above the other to give tiered leaves in vertical to somewhat spiral rows. The unknown pollen donor for Haworthia 'Bela-Rani-Atasi', cultivar No. 1, may have had spiral leaves and supplied the genes for stacking.

The angle between the retuse leaf end and its lower upper surface, the compact rosette, the window white line patterns, the hazy and the more solid white patches of the windows are well illustrated in this photograph. The very small marginal teeth also show up well against a dark background.

5. ***Haworthia*** 'Sujata'.

Parentage. *Haworthia emelyae* var. *major* ♂ x *Haworthia mirabilis* var. *mundula* ♀. A selected clone from seed batch 2011.

Description. Rosette quite open, slow growing. Average size of rosette 3" diameter. Windows large, translucent, distinctly retuse and acuminate, terminating in a significant brown spine; leaf marginal white teeth backward-pointed except at tip where a few point slightly forward; circa 3-5 white lines divide a window some bearing backward-pointing, white teeth smaller than the marginal, between the white lines scattered white dots some arranged in more or less longitudinal rows and some projecting slightly as rudimentary spines; the leaf thickness at the end is relatively thin, becoming bulbously thicker for most of leaf length; underside of the leaf random, pellucid spots and dashes are confined to the thinner end.



Name. The name honours my friend's wife Saikat.

Propagation. Leaf cuttings, offsets.

The large windows in the retuse ends; the few marginal, white, forward-pointing teeth and the many backward-pointing; the window white lines; the scattered, white dots and small backward-pointing teeth between the white lines, are all clearly shown in this photograph.

6. *Haworthia* 'Tanupam'.

Parentage. *Haworthia emelyae* var. *multifolia* ♀ x *Haworthia springbokvlakensis* ♂. Selection from the 2011 seed batch.

Description. Rosette somewhat irregularly five spiral, (irregularly because some leaves are set to one side, some to the other), spreading, somewhat flattened, not slow growing, mat-green, turns deep, dark brown when dormant. Leaves more or less, lanceolate, shallowly recurved, spreading; apex acute, slightly twisted clockwise with a short, terminal, white spine; leaf-margins many, very small, white teeth; leaf underside keel at leaf end, a few vertically watery spots; upper leaf window transparent -watery, divided by circa 5-6 chalky-white lines looped together at the base; somewhat obscured, cloudy white dots are scattered about the windows forming whitish clouds with higher concentrations, particularly around the loops and some leaf ends.

Name. Named after my friend's son Tanmay.

Propagation. Leaf cuttings.

The low, somewhat flattened, rosette results from successive shallowly -recurved leaves being set a little to one side or the other, resulting in five somewhat, irregular spirals.

The quite vivid, dark- green with white markings is striking.

The large windows are clearly shown with their distinct pattern of white lines and very small white dots contributing in greater concentrations to cloudy areas.

The small, white marginal teeth are more prominent when photographed from some angles than from others.

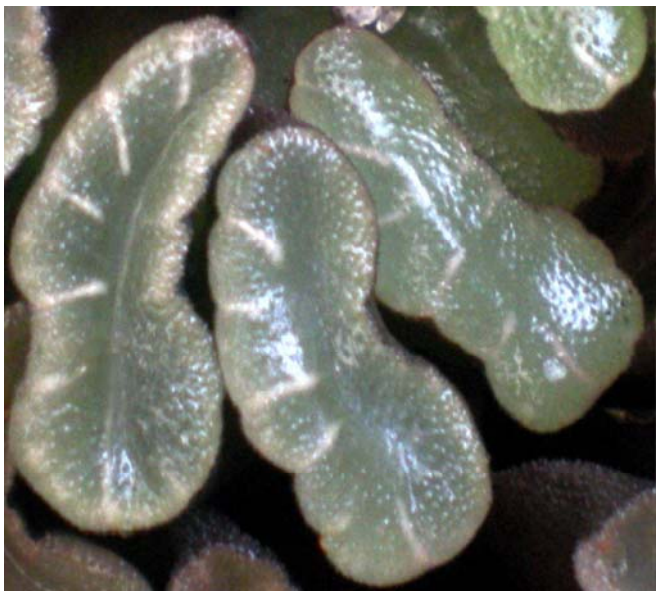
7. *Haworthia* 'The City Of Oxford'.

Parentage. *Haworthia truncata* var. *truncata* ♂ x *Haworthia truncata* var. *maughanii* ♀, a Japanese clone with variegation. A clone selected for its spiral leaf arrangement/colour/shape.

Description. The truncate leaf ends are reminiscent of those of *truncata*, not *maughanii*, but the arrangement of the leaves in a compact, spiral are reminiscent of *maughanii,* not *truncata.* In this hybrid the distichous arrangement of leaves of *truncata* are twisted into a spiral of *maughanii*. Numbers represent leaves at one side of the growing point and the corresponding ones directly opposite in a distichous arrangement. Leaves more or less vertical, much thinner than they are wide with a more or less mid point restriction and curved as demonstrated by the truncate ends. Windowed leaf ends have a shallow, central, depression across the width of the leaf sometimes with a continuous or short thin white line(s); thick white lines radiate from the outer leaf edge, frequently from distinct notches, almost up to the depression; white dots concentrated around the rim give a distinct, white glow which reduces as the number of dots decreases and which are replaced by dark green at the depressed centre, free from all but the occasional supressed dot and white line (s). As new leaves grow at the centre of the rosette they develop a diffused pinkish glow around the rim of the leaves in summer heat which fades during winter. Below the retuse ends, leaves are dark blackish-green and covered in many more or less concolorus tubercles. Flowers have not been seen on this cultivar to date.

Summer.


Late winter.



Name. Named after the dream town Oxford, England.

Propagation. Leaf cuttings.

H. truncata leaves are distichous (one leaf of a pair opposite the other with subsequent pairs immediately above the preceding in one horizontal layer - youngest at the centre, oldest at opposite extremities), *H. maughanii* leaves are multifarious (set at different levels around the stem in the form of a rosette of one or more spirals) youngest leaves in the centre of the rosette, oldest at the base). In hybrids the genes can interact resulting in different leaf arrangements.

The photograph, right, shows the many concolorus tubercles on the leaf sides of *Haworthia* 'The City Of Oxford'. The colour darkens during the summer and lightens during the winter. This photograph was taken in the late winter.

The photograph below is included solely for comparison purposes.

It is another clone from the same batch of seed as *Haworthia* 'The City Of Oxford'.

The differences in leaf shape, colour and markings between this clone and the clone selected as *Haworthia* 'The City Of Oxford' are self evident.

The journal of the Haworthia Society of Japan

Haworthia Study

English Edition

No. 27 (Aug. 2012)

***H.* 'Dream' (Picta Dan)** Diameter: 14 cm, leaf width 3 cm. Breeder/Author : Mr. OZAWA, Naoki

One of Mr. Ozawa's masterpieces, such as 'Chatarei', with distinctive thick brown lines on the white-flecked window. Line pattern is the same as 'Chatarei', but bigger than that. As great as 'Da Vinci' in Brown Picta series.

Very unique markings.

① *Haworthia* 'Chatarei' Ø =9 cm, LW=2.3 cm
A masterpiece of Ozawa Pikuta of unique, thick brown lines.

② *Haworthia* 'Gokurakuden' Ø =10 cm, LW=2.3 cm
Contrast of white flecks on the dark window is very clear.
Similar to 'Hikaru Genji'.

③ *Haworthia* 'Uchōten' Ø =9.5 cm, LW=2.5 cm
A large form clone with leisurely but neat markings, like 'Moon Child'.

④ *Haworthia* 'Sōshunfu' Ø =10 cm, LW=2.4 cm
Mat, white, flat flecks & thick green lines like 'Shimamidori'.
Great cultivar of Fukumaru series.

⑤ *Haworthia* 'Hakurakuten' Ø =9.5 cm, LW=2 cm
Sister cultivar of 'Iroha', with white, raised and very rough tubercles. "Zarame" type.

⑥ *Haworthia* 'Niagara' Ø =9.5 cm, LW=2 cm
Thought to be a hybrid between Silver form and Titan form.

Mr. Ozawa's Haworthia Pikuta - Titan Group

⑦ *Haworthia* 'Titan' Ø =11 cm, LW=3.5 cm
The biggest clone of this group with muddy brown colour.

⑧ *Haworthia* 'Fukumaden' Ø =10 cm, LW=2.5 cm
Plant form & markings are of Silver Group,
but colour of 'Titan'.

⑨ *Haworthia* 'Yasha' Ø =8 cm, LW=2 cm
Smaller than 'Titan', but dark lines are thicker and clearer.

⑩ *Haworthia* 'Yashago' Ø =8 cm, LW=2 cm
Seedling of 'Yasha', with whiter windows & clearer and thicker dark lines.

⑪ *Haworthia*'Elephant' Ø =8.5 cm, LW=2.5 cm
Very round, special leaves.

⑫ *Haworthia* 'Iwao' Ø =8.5 cm, LW=3.2 cm
Assumed a hybrid between Titan series and Fukumaru series.
Very large clone with semi-translucent brownish windows.

Cactus-Nishi's nice Haworthia cultivars.

① *Haworthia* Sakai Super White' Ø=11.5, LW=3cm
A very large clone of Silver Pikuta Gp with mat, white flecks.

② *Haworthia* 'Hohoemi' Ø =9 cm, LW=2.5 cm
Large, roundish leaves, white dots between thick green lines.
White dots and green lines will be red in Spring and Summer.

③ *Haworthia* 'Adesugata' Ø =13 cm, LW=3.5 cm
Very large clone with brown lines & white flecks in the cuticle.
White spots sunk into glass-like tissue of the windows.

④ *Haworthia*'Pink Star' Ø =14.5 cm, LW=3 cm
Sometimes called "Red Shishinden". Very large, reddish clone

⑤ *Haworthia* 'Platinum' Ø =13 cm, LW=2 cm
Very large clone. Pinkish-white windows have minute nodules.

⑥ *Haworthia*'Moulin Rouge' Ø =10, LW=2 cm
Original clone of 'Moulin Rouge'. Densely, white-dotted windows

Cactus-Nishi's nice Haworthia cultivars.

⑦ *Haworthia* 'Bushin' Ø =11.5 cm, LW=2.5 cm
Wide, triangle leaves, white teeth & windows. Great cultivar. Window surface also has white bulges and translucent nodules.

⑧ *Haworthia* 'Picasso'-2 Ø =9.5 cm, LW=1.7 cm
Picture of one of only three plants. Serial nodules with prickles on the leaf & margin are unique.

⑨ *Haworthia*'Pastel' Ø =10 cm, LW=2 cm。
Large, semi-translucent window with blunt leaf. Large clone

⑩ *Haworthia*'Skelton Lace' Ø =12, LW=1.8 cm
Large, translucent window with green veins is cool beauty. It has smaller teeth.

⑪ *Haworthia*'Silver Tarantula' Ø =9 cm, LW=2cm.

⑫ *Haworthia* 'Shirojishi' Ø =7 cm, LW=1.5 cm.
Looks like 'Silver Tarantula', but smaller. Markings are clearer.

Mr. Kaneko's nice Haworthia cultivars

① *Haworthia* 'Eiger' Ø =6.3 cm, LW=2.2 cm
It was called "MS-5" before. Large, round, blue window with purple lines & white cloud.

② *Haworthia* 'Yukihime Manzō' Ø =9 cm, LW=2 cm
Window is covered by thin, white cloud and thick white lines. Whole body is very white. Relatively rare type.

③ *Haworthia*'Incarose' Ø =10 cm, LW=2.5 cm
Contrast of copper-red marking on the white base is supreme.

④ *Haworthia* 'Soul Crown' Ø =9 cm, LW=2.5 cm
Sister cultivar of 'Yuki Hime' and 'Angel'. Translucent back

⑤ *Haworthia* 'Tokuda Mammoth' L=13, LW=7 cm, LT (Leaf Thickness)=2.2 cm. A sport from 'Mammoth'. This

⑥ *Haworthia* 'Kyohō' L=11 cm, LW=4 cm, LT=1.5 cm
Photo is a young plant starting to thicken, reticular white lines with green islands. Very big cultivar.

Mr. Ikeda's nice Haworthia cultivars

① *Haworthia* 'Shiro Kujaku' Ø =9 cm, LW=2.2 cm
Rather fine, white lines. Looks like expanded peacock tail.

② *Haworthia*'White Dragon' Ø =6.5, LW=2 cm.

③ *Haworthia* 'Sawa' Ø =6.5 cm, LW=1.8 cm
Round window with soft, white lines. Graceful & refreshing.

④ *Haworthia* 'Hiyūma' Ø =7 cm, LW=1.9 cm
Close to 'Hakuba' (M9). Thick white lines, more than 'Hakuba'.

⑤ *Haworthia* 'Sekiran-un' L=9 cm, LW=3.3 cm, LT=2.2 cm.
A very thick leaf clone with thick white lines in the celadon lens-like window.

⑥ *Haworthia* 'Bara' Ø =10 cm, LW=4.5 cm
One of the broadest clones of *H. badia.* Mat surface similar to 'Enunden'

① *Haworthia* 'Dōmu' Ø =8 cm, LW=2.5 cm
A clone with large window with numerous, very white lines.
The one in the picture is slightly unbalanced.

② *Haworthia*'Commet' Ø =8 cm, LW=1.8 cm.
A clone of sunken window with thick, white & reticular lines.

③ *Haworthia*'Tamayura' L =7 cm, LW=3 cm, LT=1.3 cm
Glaucous, convex window with white lines & green islands.

④ *Haworthia* 'Shirokuma' L =7 cm, LW=3.5 cm, LT=1.4 cm.
Covered with a thick white cloud and with white lines.
Rarely, green lines can occur.

⑤ *Haworthia* 'Akafuku' Ø =10 cm, LW=2.5 cm.
It could be Ryurin series hybrid. *H. tessellate* hyb.?
Reddish window with white, reticular lines.

⑥ *Haworthia*'Shirley' Ø =12, LW=3 cm..
One of Mr. Sakano's Konputo hybirids. Pale whitish green

Nice cultivars of Haworthia truncata

① *Haworthia* 'Kaishū' L =10 cm LW=4.6 cm LT=2 cm.
The biggest of Ukiyo (Sharaku) Gp. 'Utamaro' influence
Window is flatter and image appears masculine

② *Haworthia* L=11 cm, LW=4.5 cm, LT=1.3 cm.
Ukiyo Gp. Leaves thinner than 'Sharaku', with green islands.

③ *Haworthia* 'Hokkyoku-guma' L =8, LW=4, LT=1.4 cm.
Looks like 'Shirokuma', but plant is larger and window flatter.
Hybridized by Mr. Nakajima.

④ *Haworthia*'Hayabusa' L =11 cm LW=5 cm LT=1.6 cm.
'Mammoth' seedling. Pinkish-white lines on glaucous

⑤ *Haworthia*'Dumbo' L =10.5 cm, LW=5 cm, LT=1.5 cm.
Formerly called 'Tsukahara Kyodai No.1'. A seedling of 'Jumbo' (No.5 of this journal)? with green lines at centre of window. Mr. Sanekata's collection.

⑥ *Haworthia* 'Nishi Fuji' L =10 cm LW=3.5 cm LT=1 cm
A good form *H. truncata* like 'Yūhō' or one in Fukuya's book p.6. Mr. Kanno's collection.

Other nice cultivars.

① *Haworthia* 'Silver Jack' Ø =8.5, LW=2.5 cm
Windows are covered by white flecks with a few red lines.

② ***H. splendens* 'Love'** Ø =8 cm, LW=3 cm
Roundish, translucent, green windows with few flecks.
Slightly white dotted. Collection of Mr. Harada.

③ *H. splendens* 'Aoi' Ø =6.5 cm, LW=2 cm
Brownish leaves with thick dark lines which fuse at leaf tip.
Popular *H. splendens* v. *hansii* group.

④ *H.* 'Shiro Aoi' Ø =6 cm, LW=2.5 cm
Bud mutation of 'Aoi' with more flecks and thicker dark lines.

⑤ *H. splendens* 'Akafukumochi' Ø =9.5, LW=3 cm
Many red lines on the glossy, translucent, roundish window.
Overall red tint. Hybridized by Mr. Hayashi.
Collection of Mr. Nishi.

⑥ *Haworthia* 'Super Galaxy' L=10, LW=2.3 cm.
H. wimii hybrid often with dark, thick lines on white window.

Other nice cultivars.

⑦ *Haworthia*'Fairy' Ø =10 cm, LW=2.2 cm

⑧ *Haworthia* 'Ittan Momen' Ø =11, H=15 cm
Long leaves with very white leaf back with green eyes.
A sport of 'Juuni no Maki Wide Band'.

⑨ *Haworthia* 'Cupid' Ø =10 cm, LW=2.8 cm
Hybridized by Mr. Ozawa.
Blunt leaves with large, back window with clear brown lines.

⑩ *Haworthia*'Tsuki-no-shizuku' Ø =11 cm, LW=2.5 cm
The biggest clone of *Obtusa* Gp with blunt leaf tip.

⑪ *Haworthia* 'Maruo Nishiki' Ø =5 cm.
A variegated *Obtusa* clone with completely round leaf tip.
STC plants have different leaf tip form.

⑫ *Haworthia floribunda* variegated Ø =5.5 cm
H. floribunda (or *H. dentata*?) with clear yellow variegation.
Quite rare.

Fig.1. *Haworthia* 'Tutankhamen'
Representative cultivar of Rasputin

Fig. 2. *Haworthia* 'Green Chateau'
Wide green in centre of window

Fig. 3. *Haworthia* 'Kamen Butōkai'
Close to 'Mon Kotobuki'. Lighter green net pattern is also thicker and clearer.

Fig. 4. *Haworthia* 'Kabuki'
Karakusa Group. Glassy, smoky-green; embedded brown lines, complex pattern.

Fig. 5. *Haworthia* 'Karakusajisi'
Looks like 'Karakusa', but lines are thicker and show clear net-pattern.

Fig. 6. *Haworthia* 'Asuka Bijin'
Window glassy tissue, many white spots & short lines in decorative pattern.

Fig. 7. *Haworthia* 'Operaza-no- kajin'
(Phantom of Opera)
Semi-translucent, frosted, glass-like windows with red thick lines.

Fig.8. *Haworthia* 'Zipangu'
Whole plant red copper tint, basal half of windows have same colour nodules. Mainly red straight lines with occasional

Fig. 9. *Haworthia* 'Murasaki Taiyō'
Looks like 'Taiyou' but whole plant beautifully coloured purple.

Fig. 10. *Haworthia* 'Kyō-no-Koi'
Unique one in this series. White-frosted, pinkish window has short red lines.

Fig. 11. *Haworthia* 'Rasp 79' Big, white, opaque window reminds us of Yoten Group 'Bansho' (such as 'Amaterasu')

Fig. 12. *Haworthia* 'Rasp 90'
"Blue Hays" hybrid. Big opaque white

Rasputin Series. Mr. Kawahigashi's *H. comptoniana* hybrids. Photo: Mr. K. Sakai

Fig. 13. *Haworthia* 'Rasp 26'
Slightly white smoky windows have very thick net pattern.

Fig. 14. *Haworthia* 'Rasp 31'
Bluish-brown windows, reddish brown thick lines, windows bright red net pattern.

Fig. 15. *Haworthia* 'Rasp 44'
Similar to 'Rasp 31', red brown lines more net-like, more white spots.

Fig. 16. *Haworthia* 'Rasp 17'
Slightly raised translucent nodules have pale green margins along the edges. Very interesting pattern.

Fig. 17. *Haworthia* 'Rasp 38'
Deep green windows have bright green, thick, net-tile pattern.

Fig. 18. *Haworthia* 'Rasp 47'
Green, heart shaped big windows have greenish white lines in different pattern on different leaves.

Fig. 19. *Haworthia* 'Rasp 22'
Slightly white opaque windows have thick white net pattern.

Fig. 20. *Haworthia* 'Rasp 56'
Shiny, big windows have deep brown lines. One of the best cultivar of Red Striped Compt.

Fig. 21. *Haworthia* 'Rasp 88'
Bluish-green windows, clear, thick net pattern. One of the best Net Compt.

Fig. 22. *Haworthia* 'Rasp 24'
Looks similar to 'Gundam' (Golgo 24) but the nodules are not fluffy.

Fig. 23. *Haworthia* 'Rasp 64'
Looks similar to 'Rasp 24' but have rounder nodules.

Fig. 24. *Haworthia* 'Rasp 43'
Unusual, underside big rounded translucent windows. Ura Hannya Group.

Be Aware of Meristem Propagated Plants. Dr. M. Hayashi.

It has become popular to propagate good cultivars by meristem cloning; many meristem cloned plants can be seen at plant sales and auctions. We can easily buy good cultivars and it is an advantage for many enthusiasts to enjoy those plants. On the other hand, as cultivation becomes popular, some problems start to occur. One of these is a rapid increase in price and danger of market decline.

Generally lower prices are preferable for enthusiasts to be able to purchase good cultivars easily. However, I suppose collectors value rare and popular cultivars when they choose plants for their collections. Therefore, it is an advantage to be able to obtain good cultivars, but when many people have the cultivar, its price and popularity will rapidly decrease.

Once meristem cloned plants are on sale cheaply, expensive cultivar sales also slow down. Collectors wait for mass propagation; the market will slow down drastically. Once before, one Asian orchid market was almost destroyed by mass propagation. For the same reason, the market for *Haworthia* in Korea rapidly cooled down.

Furthermore, recently Dutch growers have propagated Japanese quality cultivars and sold them through the internet quite cheaply. A market can be frozen simply by news that Dutch growers have started propagation or that mother plants have been sent to the Netherlands. Similar slow-down, which has occurred in Korea, could spread all over the world, not only to Japan.

When they sell propagated plants cheaply, it can be good business in the short term, but in the long term, the market will decline and propagators themselves finally "squeeze their own necks". Please be aware of this point. If you are in business I ask for your understanding. Fix your pricing in the range which will not flood the market and discourage continued purchases.

Another big issue in propagation is breeders' protection. Breeders are the leaders in their own horticultural fields. However, once meristem clones become popular, the cultivars on which they spent long periods and much labour can be mass propagated instantly, and those cultivars became common and boring. Once this situation occurs, breeders cannot gather back money they have spent on breeding and cannot profit from their labours.

Growers only gain profit; breeders cannot get profit for their contribution for the cultivar's creation. This situation was the same for composers before copy right regulation was established. In this environment, breeders would lose their interest and value in their breeding business, and creation of new cultivars will slow down.

I believe a part of the profit made by propagation of good cultivars should be paid back to the breeders. Currently only registered cultivars give protection for breeders' right, but as mass production will become more popular in the near future, new regulation, which give rights to breeders without registration, will become necessary.

Furthermore, even before considering legal arrangement, I suppose gentlemen's agreement will be necessary to prevent propagation for, say, five years from the release of a new cultivar.

I believe it will be in the far future before breeders' rights start to be protected by registration, therefore, breeders should conduct self-defence strategies, such as follows, until then.

（１）When you obtain a good cultivar, only show it in exhibitions or as a picture and avoid selling any plants. But we have to accept the fact that any great cultivars will become old within 10 years by the creation of greater ones.

（２）Once you obtain a good cultivar, prepare 10 to 20 plants to sell, and release them at once to get back the expenses incurred by producing the cultivar. Never sell the plant until then. (This should be the most practical self-defence strategy)

（３）Sell the plants only to trustworthy individuals with agreed prohibition on propagation and sales to third parties. This is relatively practical, but it is not a good idea for those who are not constrained by the absence of contract and lawsuit. Also for the contract, setting a penalty charge is necessary. If the contract lack that condition, it loses its effect.

（４）Register your cultivar in Japan or The Netherlands.

Documentation work is time and money consuming, but it is a strong self-defence strategy. However, you should register the cultivar in each country; you cannot register *Haworthia* in China, but you can regulate import of plants propagated in other countries into Japan.

Meristem Propagated plants are very tender at first, but after two years acclimation, they will be as hardy as the ones propagated by cuttings. Generally speaking, meristem cloned plants grow faster and bigger. Some cultivars, like 'Oni Musha', cannot be grown to full size without meristem clone technique. Collectors may choose meristem clones with the consideration of the plant's value, rather than its size.

Even though it is said that meristem clones are genetically the same and show the same physical features, not only variegation, but various sports occur during propagation. I will introduce example in the next page, but I warn you to be aware of this kind of variation as it can happen relatively often by meristem cloning.

Caution – decrease of price by tissue culture

Many Japanese cultivars are now propagated by tissue culture in Japan, China, Korea and Holland. This mass production has reduced prices, which, initially, is good for many collectors. But a collector always likes good, rare and highly apprised cultivars. So, if a cultivar sells very cheaply by tissue culture, its popularity will soon decline.

If a tissue culture nursery sells some popular cultivars very cheaply, collectors will become cautious about the possible decline of other cultivars. Consequently, many popular cultivars will decline in popularity, and the market may fall into depression. This actually happened in Korea this year. Tissue culture nurseries please be careful to keep reasonable prices for your plants so that current popularity is maintained and market decline is avoided.

① *H.* 'Kebaginjō' Ø=8 cm, Leaf width=2.5 cm
'Daiginjō' mutation with rounder, whiter & rougher leaves.
Made by Mr. Sanekata.

② *H.* 'Fuku Daisetsu' Ø =10 cm LW=2.3 cm
'Daisetsu' mutation with rounder & rougher markings on leaves.
Made by Mr. Hayashi.

③ *H.* 'Moulin Rond' Ø=7cm, LW=2.3 cm
'Moulin Rouge' mutation with rounder & larger leaves.
Made by Mr. Kawatou and others.

④ *H.* 'Super Moulin' Ø=12cm, LW=3 cm.
Special large mutation of 'Moulin Rouge'. Very nice variant.
Perhaps it is not 'Moulin Rond'. Made by Mr. Nakajima.

⑤ *Haworthia* 'Ryōko' Ø =9 cm, LW=3 cm
'Pinky' mutation (?) with broader leaves from young stage.
Made by Ms. Ryoko Hakamada.

⑥ *Haworthia* 'En Silvania' Ø =11, LW=4.3 cm
'Silvania' mutation with special round & broad leaves.
Fewer leaves. Made by Mr. Nakajima and others.

New Considerations on Obtusa.

Dr. M. Hayashi.

Obtusa series, sensu stricto, has a blunt and short tipped leaf type and a relatively longer tipped type. In many populations, one type always dominates another. However, an intermediate type is common. Each type does not grow in a particular region, but in many places.

The main regions where the short, intermediate and long leaf types grow are 1. Somerset East, east to south east, 2. Fort Beaufort - Adelaide, 3. Kingwilliamstown, 4. Grahamstown, 5. Port Elizabeth.

These areas are separated from each other by more than 40 - 50km, therefore each has a different gene pool. Because of this, I believe classification should be made by regions, not by difficult physical characters.

The type illustration of *Haworthia obtusa* (Kew 1824), shows the side of the underside of the window remarkably dented. This feature is seen in the population of ①, but not in other populations. Therefore, I can conclude that populations in the SE of Somerset East are *H. obtusa*. 'Purple Ob' is also this species and its leaf tip is rounded by the influence of nearby *H. joeyae*.

The habitat of *H. dielsiana* ⑦ is about 20 km away from the habitat of *H. obtusa*. The physical characters are different and therefore I consider they are a different species, *H. dielsiana*.

Fort Beaufort has several distinctly big plant populations. I think 'Emperor' is one of them. I call this population of big individuals *H. imperialis* ⑧.

South of Fort Beaufort, there are remarkably bluish populations. These are affected by *H. elegans*, in the Pallens group of plants. I consider them to be *H. paraiba*.

H. cooperi has long leaf tips, but this type can be seen in many different places. However, Kingwilliamstown region seems to have many acuminated leaf populations. Breuer et al. (1997) also has designated the epitype in northern Kingwilliamstown. Based on their designation, demes around Kingwilliamstown can be considered. (Note 2015: *H. cooperi = H. specksii.*)

The species epithet of *H. pilifera* means "having horn" Therefore plants having a blunt leaf tip with awn are usually called *H. pilifera.* But the type illustration indicates leaf tips of this species are acuminate (not blunt) and especially the teeth around windows are conspicuous. These are very distinctive characters of the species. The most possible candidate for *H. pilifer,* obtusa-like plant with acuminate leaftip and conspicuous teeth, may be the plants in the western south of Sumerset East (IB 7072,12595). The name may be applied to the demes in this area.

The demes around Grahamstown are mostly the blunt tipped type and named *H. fumosa* n.n.

The demes around Port Elizabeth are close to *H. gordoniana* and *H. venusta*, some clones have fine hair on windows. These demes can be classified as *H. salina* ⑪.

Table 1 is a digest list of the explanations above. This list is different from Bayer's and Breuer's, but it could help to show the differences based on geographical regions. However, there are populations with unique characteristics (i.e. *H. foeda* n.n. Alicedale MBB 6845). I will describe these on other ocasions.

Note: This short article was written more than 2 yeas ago, and the writer has now different views on some points. Newer arrangements, especially for the correct application of the names *H. cooper*, *H. vittata* and *H. pilifera* based on Cooper's travel record, were published in Haworthia Study No. 30.

A new arrangement of the Obtusa Group (Obtusa series) based on distribution areas is proposed.

Table 1. A new arrangement of Obtusa Group

Name	Type	Type locality	Distribution area	IB No.
H. obtusa	Kew (1824)	SE Somerset East*	E~SE Somerset East	6402, 6940, 6992, 7232, 11771
H. dielsiana	Hutton 489	Sheldon	Sheldon	12621
H. imperialis n.n.	IB 8576	Fort Beaufort	Fort Beaufort	6554, 6945, 8576
H. glaucina n.n	IB 12529	N Edendale	S Fort Beaufort	6271, 7231, 12529, 12631, 12766
H. cooperi	Barker (1871)	Keiskammahoek**	Kingwilliamstown	237, 4736,
H. pilifera	Barker (1871)	The Ridge*	SW Somerset East	7072, 12595
H. fumosa n.n.	MH 03-33	Glen Craig	Grahamstown, Fish River	4826, 6144, 6809, 7024, 7030, 8393, 11254, 12655, 12758
H. salina	Long 336	Bethelsdorp Salt Pan	Port Elizabeth	6516, 8618, 11530

*: presumed **: epitype (Breuer & al. 1997)

Obtusa Group. Photo: mostly by I. Breuer

① *H. obtusa* Lectotype Kew 1824. Note dent of window side near leaf tip. It is a distinction of SE Somerset East.

② *H. cooperi* Type figure 1871 Acuminated leaf tip form is found in many areas of Eastern Cape.

③ *H. pilifera* Type figure 1871 This is a semi-acuminated (non-blunt) plant with many short, notable teeth.

④ *H. obtusa* SE Somerset East, IB 6402. Many plants of this area have dents (more or less) in window side.

⑤ *H. cooperi* SE King Williams Town, IB 237. Acuminated form is dominant in Kingwilliamstown area.

⑥ *H. pilifera* (W.) Somerset East, IB 7072. This was called "H. dielsiana", but may be true *H. pilifera*.

⑦ *H. dielsiana* Sheldon, IB 12621 *H. dielsiana* at type locality is more acuminate than Slagter's Neck plants.

⑧ *H. imperialis* n.n. Fort Beaufort, IB 8576. A very large, robust form grows in and near Fort Beaufort.

⑨ *H. glaucina* n.n. Edendale, IB 12529. Bluish demes in S Fort Beaufort area may have genes from *H. elegans*.

⑩ *H. fumosa* n.n Glen Craig, IB 12655. Around Grahamstown, there are many demes with blunt leaf tip.

⑪ *H. salina* Red House, IB 8618. In P.E. area, there are many demes of bluish plants, often with minute cilia.

⑫ *H. elegans* n.n. Koonap River Bridge, IB 8581. A Pallens group deme with gene interaction with *H. glaucina*.

Maxima Group. Dr. M. Hayashi.

The Maxima Group is a descendant of the Minima Group. The hybridization of *H. poellnitziana* with *H. stellata* (*H. pumila* x *H. marginata* sensu Bayer) at Drew may be the turning point from *H. minima*-like plants to *H. maxima*. It is considered that the Maxima Group is an enlarged group of *H. minima* via *H. poellnitziana*. Interactive hybridization among *H. poellnitziana*, *H. stellata* and *H. carinata* (*H. marginata* of Ashton) around the Drew region triggered the group's differentiation.

Before *H. maxima* spread to the Robertson-Worcester Karoo, several demes of the Minima Group may have evolved there in the Worcester Karoo. But *H. maxima* has advantage for seed dispersal by wings on the seeds. *H. maxima* seeds can be spread more widely than those of *H. minima*. Consequently *H. minima* demes have been taken over by *H. maxima* by repeated introgression leaving hybridized demes in several degree. Some demes showing traces of the hybridization with Minima Group can be found in Worcester Karoo (Figs. 1-3), because the takeover of *minima* demes by *H. maxima* in this area may have happened more recently than those in Robertson Karoo.

The deme in Mowers (*H. moweris* n.n.) has dense nodules compared with other regions, and some clones look like *H. minima* (Fig.1). It is named *H. moweris* f. *hanaii* n.n. As Mowers is located over 60km away from the nearest *minima* type demes, it is difficult to estimate that f. *hanaii* in Mowers was grown from seeds from *minima* type demes. Furthermore, this plant is far bigger than *H. minima* or *H. minor*. These indicate that the original deme of *H. moweris* was *H. minima* type plants.

Similar to the above case, the deme in southern Worcester (*H. anulata* n.n.) has leaves covered with dense nodules on both sides. Leaves are also relatively long and the plant looks a like giant *H. minima.* This deme may also have originated from *H. minima*-like plants. In addition, some clones of this deme have ring shape nodules (Fig.2), and it is considered as an origin of 'Donut Fuyu-no-seiza'.

The deme in eastern Worcester (*H. nivalis* n.n. Fig.3) also has very white nodules on both sides of the leaves. It is difficult to identify it from *H. minima* especially in its juvenile or young stages.

On the other hand, the Maxima group also contains *H. stellata* or *H. carinata* type plants, other origins of the Maxima group.

Between Swellendam and Stomsvlei, demes with a few nodules, *H. subsparsa* n.n. (Fig. 4), are found. Isolated demes in the southern Little Karoo, Montagu and Barrydale (Fig. 5), also have sparse warts. Together with *H. sparsa* at Lemoenpoort, these demes with sparse warts may be descendants of sparse nodule form of *H. stellata* with the genetic influence of *H. maxima.*

Demes with very big nodules, *H. prominens* n.n. (Fig. 6) spread around the southern shore of the Brede River of Worcester Karoo. Its nodule is glazed (polished), semi-translucent and pearly (usually it is opaque and ivory-like). This is the same character with *H. carinata* nodules. The pearl-like, big nodules can be also seen in *H. enma* n.n., north-west Worcester. In this deme, concolor nodule clones are often found (Fig. 7). *H. prominens* n.n. and *H. enma* n.n. may be descendants of *H. carinata*.

Osplaas deme in the east De Doorns (*H. osplasa* n.n., Fig. 8) has very dense, semi-glazed warts on both sides of the leaves. Their warts character is intermediate between pearly and ivory-like. This deme may have had genetic influence by both *H. anulata* (Fig. 2) and *H. enma* (Fig. 7).

H. ohkuwaii n.n. (Figs. 9, 10) in north-west Little Karoo has very dense and large nodules on both sides of the leaves. This is the best form in the Maxima Group in horticultural. From the morphological and geographical aspects, it is clearly assumed as a descendant of *H. osplasa* n.n. in east De. Doorns.

A deme in Matjiesfontein (*H. martinii* n.n., Fig. 11) has obviously smaller nodules on pale green leaves. It is clearly different from *H. ohkuwai* and seems to be a descendant of the De Wet deme of *H. maxima* (Fig. 12). The latter (*H. maxima* De Wet) is not certain to be separated from *H. maxima*.

The following is an additional part by the author at 2015.

The name *H. margaritifera* v. *corallina* Baker was applied to *H. minima*-like plants around Swellendam area (*H. swellens* n.n.) as "*H. corallina*" for long time. It has dense white nodules on the both side of the leaf and looks very white.

But there is no meaning of white or whitish in the term "corallina". It means "coral-red color".

H. margaritifera v. *corallina* should be a reddish species. Baker described it has 50~63 mm long leaves (very small), upper side of the leaf is sparsely tubercled (distinction of Maxima group, not Minima group), and tubercles often reduce to greenish.

The name *H. akaonii* Hayashi was given to a deme at Rooiberg (Worcester), near the top. It is a dwarf *maxima*-type species, with very reddish colour and tubercles often reduce to concolor (greenish). All these distinctions well agree with the name and description of *H. margaritifera* v. *corallina.*

As the name *"H. corallina"* has not yet been published, *H. akaonii* is the correct name for this species.

H. akaonii Rooiberg.

Maxima Group. Photo by Martin Scott unless otherwise indicated.

Fig.1. *H. moweris* n.n. f. *hanaii* n.n. Mowers. This may indicate that this deme was of *H. minima*. Photo=Hanai

Fig. 2. *H. anulata* n.n. S. Worcester Plants of this deme have dense, white warts (often ring form). Photo=Hayashi.

Fig. 3. *H. nivalis n.n.* Photo=Breuer IB15771 Oudewagensdrift E. Worcester. Young plants look similar to *H. minima*.

Fig. 4. *H. subsparsa* n.n. Vaandrigsdrift Some demes near Swellendam have a few warts (descendants of *H. stellata*).

Fig. 5. *H. barryda* n.n. E. Barrydale Demes from Barrydale to W. Montagu (N. of Langeberg Mt.) have a few warts.

Fig. 6. *H. prominens* n.n. Kniediep, Scherpenheuwel. Warts are very large, prominent & pearly (opaline, polished).

Fig. 7 *H. enma* n.n. Brewelskloof, N. Worcester. Warts are very large & polished (grazed), and often concolor.

Fig.8 *H. osplasa* n.n. Osplaas, NE. De Doorns. Many, somewhat angular warts on the both side of a leaf.

Fig. 9 *H. ohkuwai* Vrede, Anysberg. Warts are large & dense, very white and somewhat angular.

Fig. 10 *H. ohkuwai* Keurfontein Mostly similar to Vrede deme, but warts are more roundish and polished.

Fig. 11 *H. martinii* n.n. Matjiesfontein Leaf is paler and warts are smaller, not raised & not polished as in *H. ohkuwai*.

Fig. 12 *H. maxima* De Wet, NE Worcester. May be the ancestor of *H. martini*, but uncertain to be separated.

1. *H. dimoroha* Ø=7cm. Some seedlings of *H. dimoroha* have many maculae. The one in the picture is a middle level maculae plant. Collection of Dr. Hayashi.

2. *H. dimoroha* GM 646 Laingsburg Ø=7cm
A different *H. dimoroha* seedling with many maculae. Collection of Mr. Hanai.

3. *H. limbata* 'Shiosai' Ø＝8.5cm Found at "Tunnel East"
Very unique plant with very many translucent maculae. Breeder : Hayashi

4. Nishii hybrid *H.* 'Yumeji' A Ø＝7cm
H. nishii n.n. hyb. Window is very translucent and larger than a half leaf. Breeder: Hayashi

5. Nishii hybrid *H.* 'Minamo' Ø＝6 cm
H. nishii hybrid with purple leaves & transparent window (more than 1/2 of a leaf). Breeder: Mr. Hanai

6. Nishii hybrid *H.* 'Jinbē' Ø＝6cm
H. nishii hybrid with many bubble-like maculae which are clearer than 'Minamo' and make a whale shark pattern. Window is more than 1/2 leaf. Breeder: Mr. Hanai

Haworthia Study.

Editor original Japanese edition: Dr. M. Hayashi
info@haworthia.net

Editor English translation: Harry Mays
hmays@freenetname.co.uk

Translator: Yuichi Murayama. Incorporated updated information: Dr M. Hayashi