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Hoya revoluta Wight
Photo by Kim F. Yap, Singapore

INTERNATIONAL HOYA ASSOCIATION

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Fraterna

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Our Cover story "A Tale of Two Sections"

by Dale Kloppenburg

Sections ? Yes. Taxonomists in an effort to aid in understanding plants divide them into groupings of similar species. A genera (hoya) can be divided into Sections as one division. *Hoya lacunosa* Blume is the type species (representative) for the Otostemma Section. The skirt is typical of the Section Otostemma. It also does not have a channel on the undersides of the coronal lobes. Section Acanthostemma species (*Hoya bilobata* Schlechter), are bilobed and the lower side of each scale is channeled.

Now for the interesting part. Species are biological entities, so do not always fit clearly into our arbitrary classifications. In some instances we find species which are intermediate or have characteristics between two classifications. In continuous variations this is to be expected.

In the case of our subject **Hoya revoluta** as you can see from the photos below, this species like the Acanthostemma has bilobes and a short channel on the undersides of the coronal scales. Like the section Otostemma it also has a beautiful veil-like skirt.

I have recently been receiving several clones of this species from Kim Yap in Singapore of material collected in Malaysia. This material is like that of Dr. Rintz and matches his drawing perfectly. After examining this material it seems strange that neither the type description nor subsequent descriptions of this species mentions the skirt on the corona in detail. Having the characteristics of two sections places it as an intermediate species. No one seems to have placed any emphasis on this character or recognized that it bridges the two sections. Now at last we have in cultivation a number of clones of the true species. It has a distinctive umbel, unlike any other I am familiar with. On close examination the skirt is plainly visible, so there should be no doubt as to its correctness.

This species is easy to delineate from other bilobed species by its distinctive bloom cluster, with the very irregular lengths of the pedicels. I want to acknowledge my thanks and appreciation to **David Liddle** for providing me with a copy of the Syntype of this species, Maingay 1127 (K). Seeing the drawings on this sheet were invaluable in determining the valid identity of this species.

Hoya revoluta Wight ex Hooker

In Flora of British India 4 (1883) 55. Wight (J. D. Hooker). 10. **H. revoluta**, Wight mss.; quite glabrous, leaves ovate or ovate-lanceolate acuminate very thick and fleshy, margins strongly recurved, peduncles long slender, corolla revolute villous within, column conical. Wall. Cat. 8160 b.

Malacca, Griffith, Maingay (Kew Distrib. 1127). Singapore, Wallich.

Stems climbing. Leaves 1 ½ - 3 in., midrib and nerves not visible, base acute; petiole 1/8-1/6 in., very thick. Peduncle equaling the leaves; pedicels very slender. Sepals ovate. Corolla 1/8 in. diam., pink. Corona-processes membranaceous, united into a conical vertically 5-lobed column, each lobed again, longitudinally folded and produced upwards into an acute point.

In Malayan Nature Journal 30(3/4) (1978) 489-490. R. E. Rintz. 5) **Hoya revoluta** Wight, F. B. I. IV (1883) 55. Type: Malaysia, Melaka, Maingay 1127 (K).
Distinguishing Features: STEMS thin. LEAVES fleshy, elliptical with long-attenuate bases and ridged margins up to 8cm long by 4 cm wide. PEDUNCLE reflexed, rigid, up to 5cm long

UMBEL positively-geotropic, concave with rigid, curved pedicels 2mm-5cm long; 1 - 30 flowers, open 4 days. COROLLA finely pubescent inside with a low ridge inside near the base of the tube; c. 5mm diam; pale pink. CORONA lower lobe divaricate at the tip; upper lobe deep red or not, lower lobe white or pale pink. CAUDICLES broadly winged. FOLLICLE c. 25cm long by 2mm diam.

Ecology: Common in lowland and hill forests throughout the peninsula; common on limestone hills and often along beaches; not often fruiting.

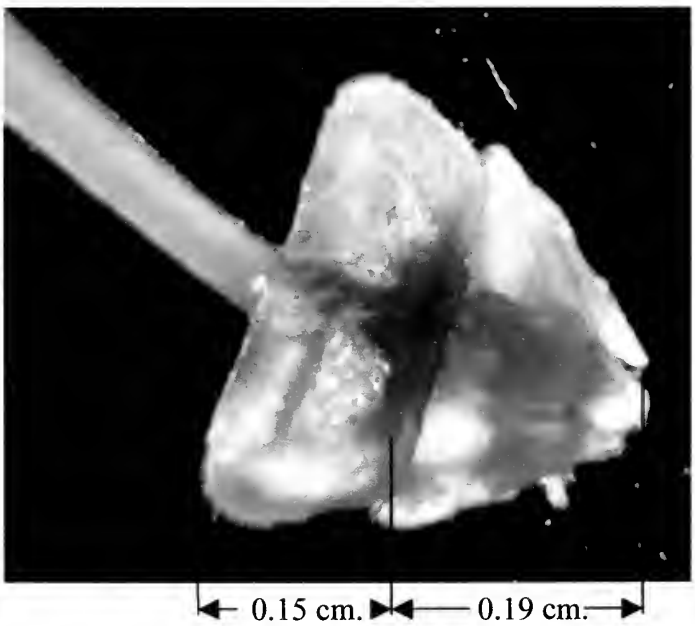
Distribution: S. Thailand, Laos, Sumatra, Borneo, Java.

From his key: 7a. Leaf base long-attenuate; outermost pedicels long-filiform.

Digital photos of the floral parts

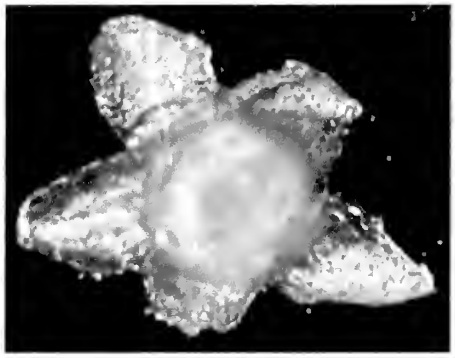
Flowers sent from Singapore by **Kim F. Yap** July 2003. Photos above by **Kim F. Yap.**

The floral clusters of this species are very loose with varying length pedicels in a geotropic configuration. There appears to be 16 flowers in the cluster.



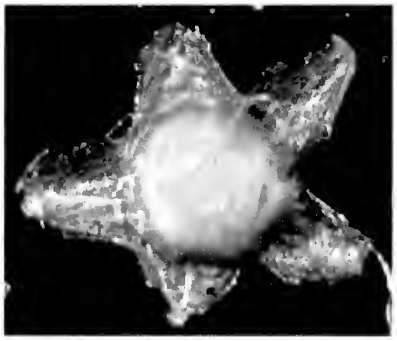
Side view of a flower. The corolla is tightly revolute from a curved glabrous, terete pedicel. The corona covers a sunken impression in the flower center lined with short hirsute cells with a thickened pentagonal surrounding region. The crown is a raised central cone.

Pedicel and calyx side view enlarged about 16X. Pedicels are of various lengths 1.0 - 2.0 cm. long x 0.07 cm. in diameter, curves forming a loose geotropic umbel, terete, glabrous, slightly larger at the peduncle end.

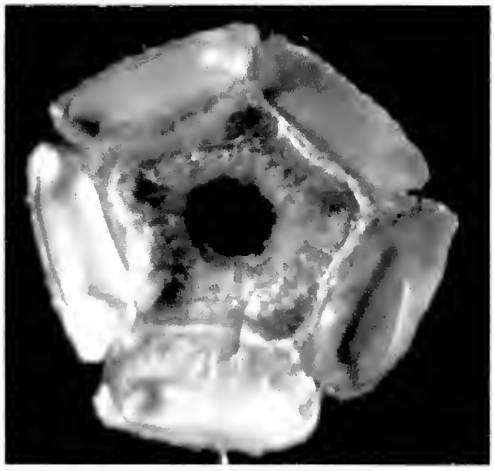


Outside view of the calyx cut from the pedicel greatly enlarged. Calyx is small and flat. Sepals do not reach the corolla sinuses. Glabrous both surfaces but outer surface is finely granulose, central portion thickened, broadly linear.

Base - apex	0.11 cm.
Center - apex	0.15 cm.
Base width	0.07 cm.



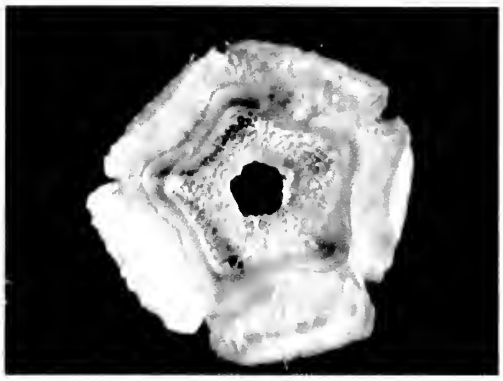
Inside view of the calyx. Ligules are present but difficult to detect, as they are the same color and texture as the sepals. Base of sepals are very slightly overlapped. In removing the pedicel and calyx the ovaries remain with the corolla.



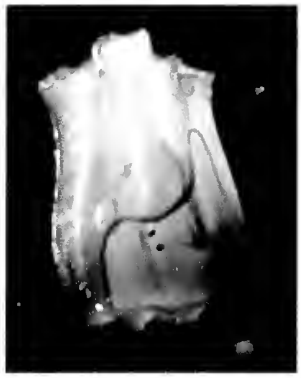
Outside surface of the corolla greatly enlarged. The corolla lobes are tightly revolute. The rolled under portions are glabrous on all surfaces, as is the outer surface. In the digital photos the light shines through the surface to reveal features of the opposite surface, here puberulous (central portion).

Sinus-sinus	0.17 cm.
Sinus - center	0.15 cm.
Widest	0.22 cm.
Apex - sinus	0.31cm.
Apex - center	0.42 cm.

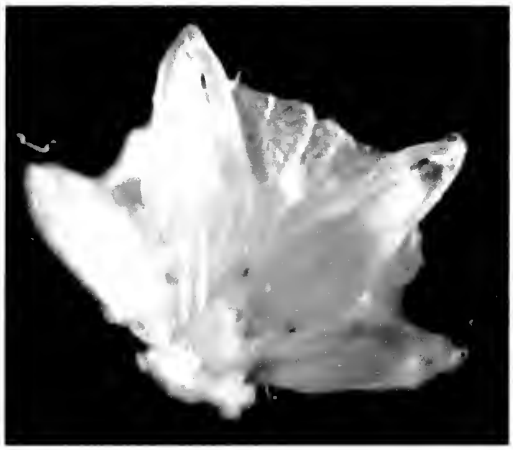
cut over half way, diameter flattened is 0.84 cm. a small flower.



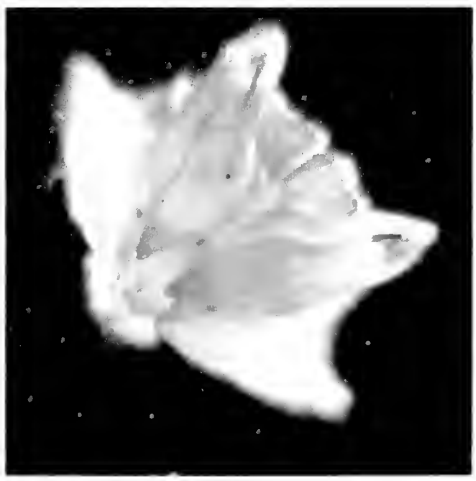
Inside view of the corolla. This species like its country cousin *Hoya plicata* King & Gamble has a thickened pentagonal ring under the corona on this inner surface. The surface inside the ring is sunken and very hirsute, the rolled edges outside are puberulous and the lobes are glabrous. The thickened apical points are toward the corolla sinuses but do not extend to the sinuses. The corona is extended on a narrow column (not shown here).



Central column with ovaries internal, greatly enlarged, some preserving liquid partially fills the lower right side. Ovaries are long and tapered, a cylindrical column.

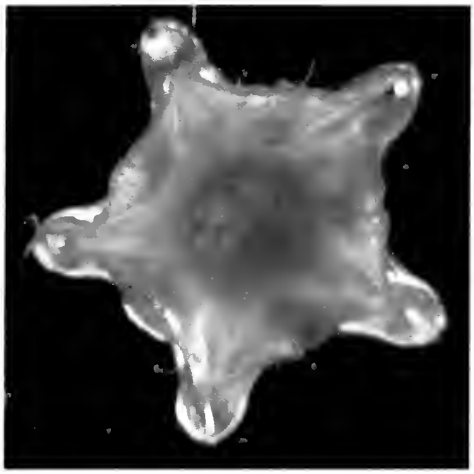


Corona greatly enlarged. **A surprising find here, this species is intermediate between two sections (Otostemma and Acanthostemma) like *H. lacunosa* it has the skirt visible between the coronal lobes and also the bilobes typical of species like *H. bilobata*.** The inner lobes here are thick spatulate, the outer apex narrowly rounded and blunt. The side lobes arise at the retinacular area well toward the inner apices and extend well beyond the scale outer apex. Another unusual aspect is that these bilobes extend in a vertical manner (widest vertically). The skirt is also unusual having a granulose surface texture. The anthers exceed the inner lobes slightly.



Another view showing the inner lob apex more clearly. The retinaculum is well up on the crown.

Apex - apex	0.15 cm.
Apex - end	0.18 cm.
Apex - center	0.17 cm.
Center - end	0.21 cm.
Widest (scale top)	0.05 cm
Width	0.09 cm.
Ret. - ret.	0.06 cm.
Ret. - center	0.05 cm.
ret. - Aw.	0.05 cm.



Bottom view of the corona with its skirt and also short groove formed by the extended and curved coronal bilobes. The channel is proportionately shorter here than on most Acanthostemma section hoyas. This whole structure sits over the depression in the corolla center and supported by the narrow column surrounding the ovaries. The skirt is lobed at its center on each pentagonal side, not cut deeply as in some Otostemma species.

Side view of a coronal scale greatly enlarged. Note the dorsal surface of the scale has an unusual pleated surface. Outer scale apex ends abruptly surrounded by the two bilobes, which meet at their apexes. They extend from an area opposite the retinacula. The inner apex is thickly spatulate and is exceeded by the anther. The anther wings are narrow and can be seen along the lower edge of the bilobed. Some columnar tissue is attached as well as the granular surfaced skirt section.

The pentagonal based raised stylar crown. The head here is domed and mealy in structure. The ends of the ridges leading to the stylar crown are where the retinacula and stigmas are located. The ridges can be seen running up from below to the crown head.

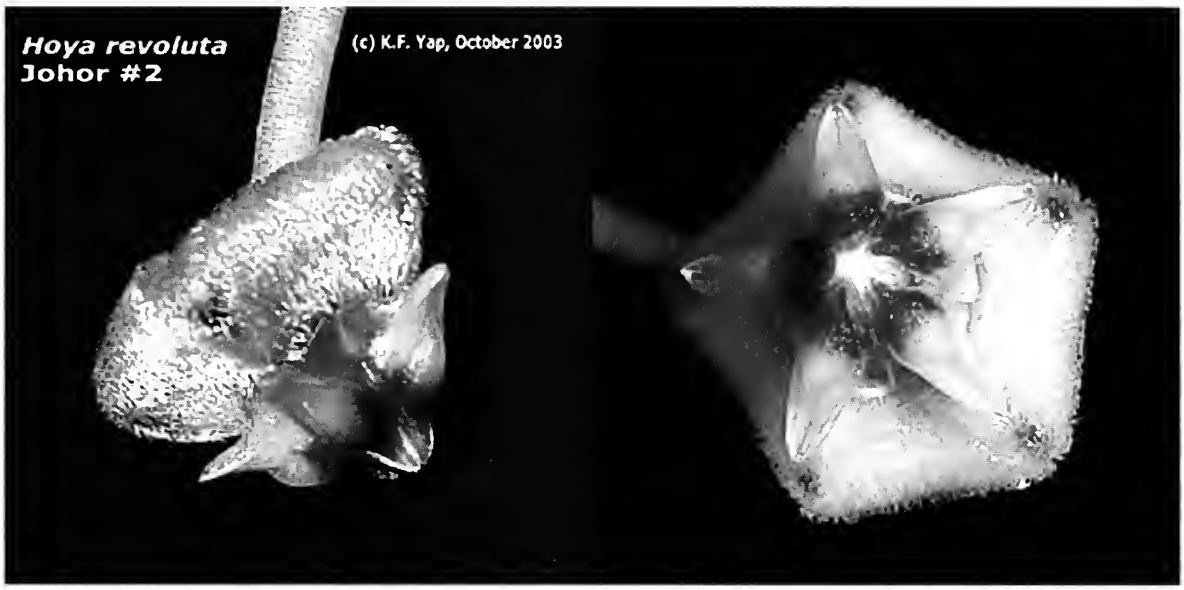
The pollinarium enlarged about 165X. The pollinia inner apexes are truncated inwardly. The translators are long and with bulb-like outer apexes. The clear caudicle is clearly defined. The retinaculum has a broad head and well developed extensions.

This is a photo of unknown origin, which I assume was taken in the wild. This is a typical umbel of this species, same as the one presented by Dr. Rintz in his excellent work on the Malaysian hoya species. In many instances this species is forming new primordial flowers in the center of the cluster when it is in full bloom. The really diverse lengths of the filamentous pedicels is typical.

Drawing in upper right corner of Type sheet.

Drawing in lower right corner.

Since the sheet is old and this is only a reduced photocopy sent via E-mail it lacks in clarity, but major features show (the central ring on the corolla, the skirt and others). At the least Maingay, a medical doctor, took the time to make drawings.



A new clone of this species collected in October 2003 East coast of Malaysia

My Five Favorite Hoyas

By Ann Wayman

I have been asked by Chuck Everson to write about my five favorite hoyas. It's been a very long time since I have written anything for Fraterna, so I'm not quite sure where to begin. All of us who grow many different species of hoya have our favorite, not so favorite and then there are a few that we downright dislike but hang onto them anyway. I went through all my

plants and came to the conclusion that there is no way I can pick five favorites only. There is probably about twenty that I really, really like and maybe another twenty that are right up there with the favorites but are lacking some qualities that they need for top billing.

Hoya sp. Ceram

Photo left by Dale Kloppenburg/ Photo right by Ann Wayman

I would have to pick the little plant we call *H. species from Ceram* as my all time, all around favorite. The main reason that I like this plant so much is because of the beautiful way it drapes in a basket. It is the perfect basket plant. The leaves are a lovely green, lance shaped and streaked and spotted with pink and white. The flowers are small but not too small, a brilliant carmine red and have a fuzzy white halo surrounding the petals. This plant blooms all year long for me with anywhere from six or seven umbels of twenty five flowers to the umbel or more. In the spring it is one of the first of my hoyas to put on a display of at least thirty umbels and will continue to bloom until the summer heat slows it down. I keep this plant in a five inch basket with my favorite home made potting mix of three parts peat moss, two parts perlite and one part vermiculite, and fertilize at every watering with a very weak solution of Schultz all purpose fertilizer. I repot it every other year but always put it back into the same size pot.

Hoya cagayanensis Burton

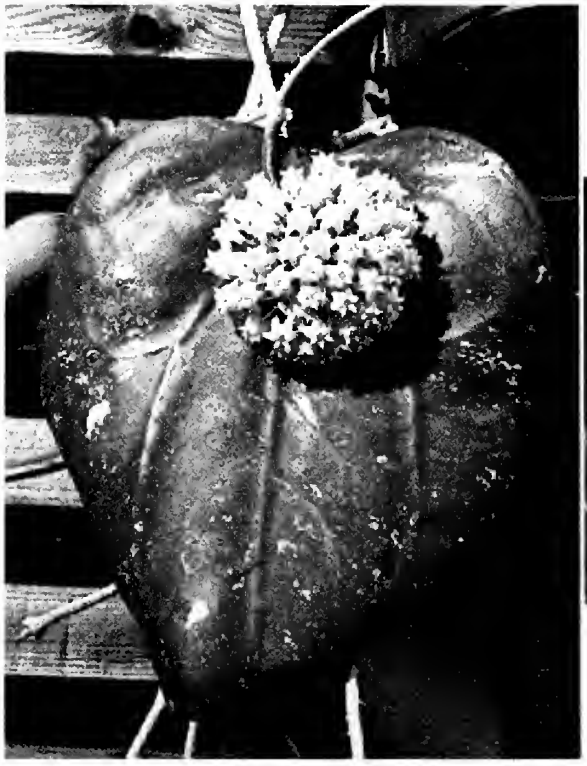
Another favorite Hoya is *H. cagayanensis* Burton (see next page for photo). This plant came to us with the label of CMF-8 from Charles Marsden Fitch, who brought it back from the Philippines. It was erroneously named *H. bordenii* for several years until I looked at the flowers over and over under my microscope. I was pretty sure it was *H. cagayanensis* from the description and the Schlechter drawing I had but needed a second opinion. I sent pickled flowers

to Dale for study and after a few months he answered saying that I was right and it was definitely *H. cagayanensis*.

This is another gorgeous basket plant with leathery, medium green elliptic leaves, penninerved, with beautiful white marbling. This is not a really great bloomer but blooms at least once a year for a month or so with very pretty medium sized pink flowers with red tips. This plant can grow to three or four foot long and is a real focal point in my greenhouse, even without flowers.

Hoya loyceandrewsiana Green

A third favorite is among the largest of hoyas (see photo on next page), and for many years was called by several different names. Probably the most popular name was "The pancake Hoya". It is a huge plant with extremely large leathery leaves with large white veins and a purple edge, almost completely round but slightly flattened on the stem end. The leaf stem (petiole) that is attached to the leaf is dark purple. Ted Green finally published it as *H. loyceandrewsiana* in honor of the lady from Texas whom he got it from (Loyce Andrews). This is always the first plant to bloom in the spring and has huge umbels of 50 or more creamy yellow flowers with a white corona. This plant will continue to bloom for me all spring and summer, putting up one fabulous display of flowers after another. There can be as many as twelve to fifteen umbels open at a time, and the flowers last approximately six days but have been known to last for up to ten days.



Hoya mindorensis Schlechter

My fourth favorite hoya is another Philippine plant I got from Dale Kloppenburg with just the number 890508 (see next page for photo). We had no idea what this plant was but it had a very pretty medium green leaf, oblanceolate-elliptic and quite leathery. This plant bloomed for me at eighteen months from a cutting, and to my surprise turned out to be *H. mindorensis*, or at least it appeared to match Schlechter's description and drawing. A year or so later I ordered a cutting from David Liddle of the plant he called *H. mindorensis*. The cutting rooted within ten days and within a year was forming bloom spurs. The leaves looked different than my plant I got from Dale, but was close enough to qualify as maybe just a different clone. When the Liddle plant bloomed, it was a big surprise. For one thing, the flowers were very large compared to the flowers on the plant I got from Dale. They are rusty red and the fuzzy prickles on the petals are different. In some ways it looks like the white flowered plant with the orange corona that I got from Dale, yet in other ways it doesn't. Whether it's a different variety of mindorensis or a different species, I couldn't say but Dale is studying flowers from both of these plants even as I write, so maybe we will have an answer soon. Whatever they turn out to be. I love them both. They are equally as beautiful and both are reliable bloomers.

Photo by Ann Wayman

Photo by Monina Siar (A New Clone)

Hoya bilobata Schlechter

Last but not least of my favorites (see photos below) for this session is the little plant that so many of us had with the name *H. 'Ben Hardy'*. I talked to Ben Hardy several years ago and he told me that the only reason he could figure out that his name got to be on this plant, was because he sent cuttings to several people and because nobody knew for sure what it was, someone had tacked on the name of the person they had received it from, hence it became 'Ben Hardy'. This plant was identified finally as *H. bilobata* from the Philippines. The only way to describe this plant is "Cute", it's adorable. It has tiny, almost round, fuzzy dark green leaves, usually with purple edges. The leaves become so full and dense that it is impossible to see the pot. The flowers are very tiny, the entire umbel being only about an inch across, but easy to see because there are so many of them and they are such a deep orange red. My plants bloom year round in my greenhouse and seem to smile hello when I talk to them. Yes, I talk to my plants!

A Couple of El-Biggo Seed Pods

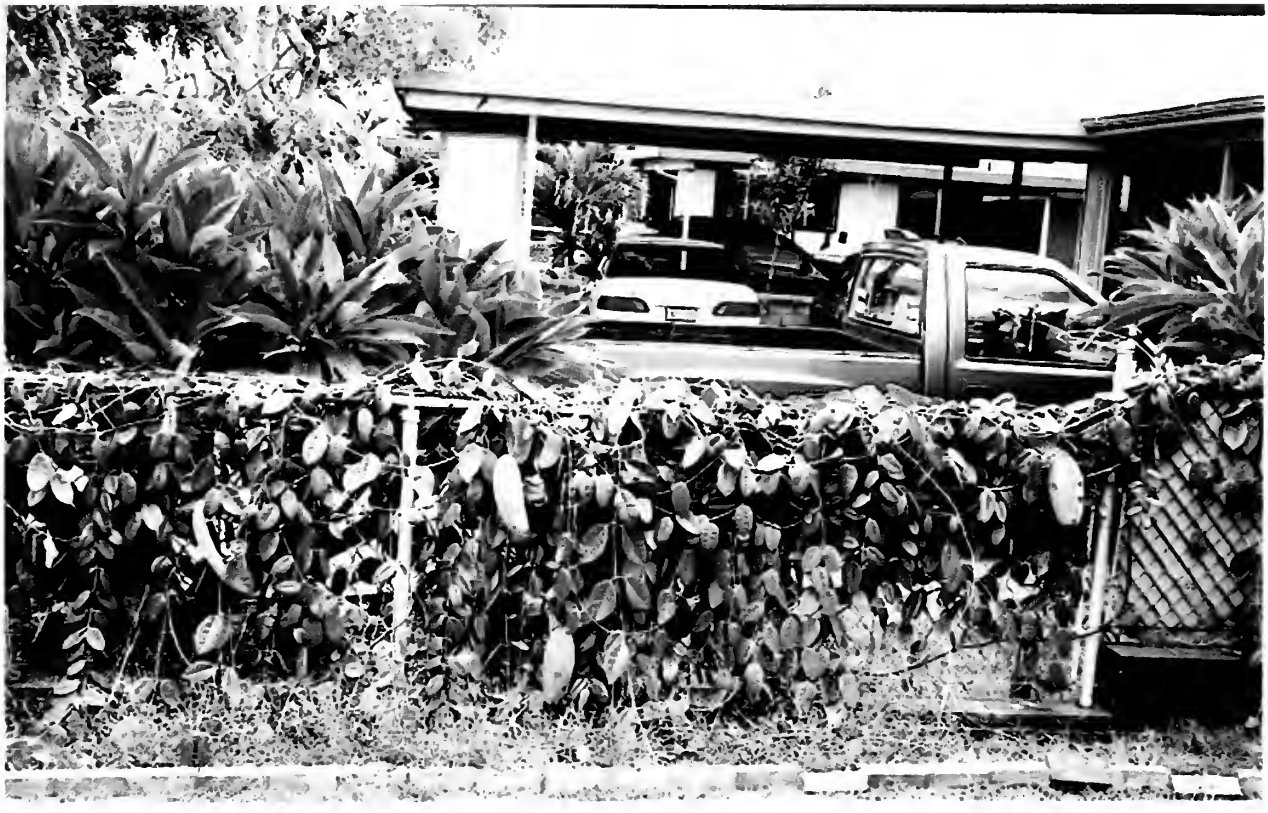
by Ted Green Green: **Plant Research Kaaawa, Hawaii**

Undoubtedly, you will never see Eriostemma seed pods like these if you are growing your plants inside for the plants have to have heat, sun, the right temperature - and a pollinator. Ed Gilding lives in a hot, dry and sunny area of Honolulu called Pearl City and it has proved to be an ideal place for the Eriostemma Hoyas. Ed planted *E. coronaria, E. guppyi, E. affinis, E. obtusifoliodes* (tentative name) and several other Eriostemmas in his front yard, close to a chain link fence so that they would have support. This proved to be the ideal place for in addition to the bright sun and air movement there were natural pollinators - Ed being one of them!

The plants shown below are about 5 years old and it is hard to keep them in bounds for they scramble all over each other. Inter-twined, it also makes it hard to tell if the seed pod is of one species or a hybrid. The only way to be sure is to find the label on one where Ed has deliberately set a pod - as the new (E. coronaria x E. lauterbachii). Incidentally, this cross has grown on and flowered with interesting, large, partially cupped flowers!

On the next page, notice the difference in the shape of the pods - long and skinny, like a cigar; and, fat and broad. One thing that is not obvious in these photos is the mixture of colors - red, green, yellow and peach.

These photos are by Ed's mom, MonetteGilding.



Information gleaned from others by Dale Kloppenburg

The movement of organisms into new environments drives speciation. Environmental changes affecting (plants) also drives speciation.

We look for simple answers but we almost always find a mess. It is the mess that drives us to seek the truth.

Changing a gene will change a protein, which may have widespread and varying effects. Any one gene participates in many functions and many functions have the participation of many genes, Genes will be active or not depending on the individual environmental situation. Notice the change in the color of hoya flowers developing in cool weather and in the warmest periods. See the difference in the addition of iron to a potting mix.

Photo Gallery Descriptions

Top row left picture: *Hoya meliflua* (Blanco) Merrill. Photo sent by Monina Siar of the plant breeding project, University of the Philippines at Los Banos, Philippines. This species was first named by Father Blanco (A catholic priest) who found it on a street "Balicbalic", Quezon City in 1837. This is a strong growing plant, which produces flowers easily. Like its sister species *H. diversifolia* and *Hoya kerrii* it has lots of honey dew that runs down the fuzzy corolla and stains it. Anyone should be able to grow this hoya.

Top row right picture: *Hoya archboldiana* Norman. Another picture sent by Monina and this one is spectacular. A really beautiful plant and flower. It comes from the central part of New Guinea. First collected in 1933 at Rona on the Laloki River at an altitude of 450 meters. We are fortunate that it was recollected and available for all to grow and enjoy. This hoya has beautiful glossy green foliage, attractive even when not in bloom. A species for most every collector.

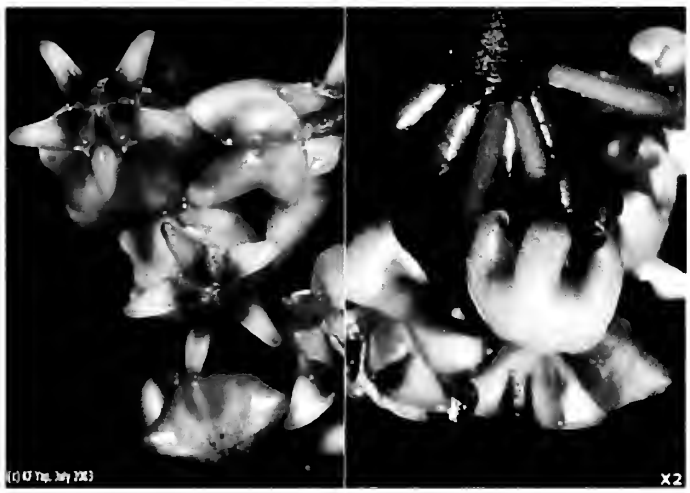
Second row left picture: *Hoya nummularioides* Costantin. First found in Cambodia and Laos but also found in Thailand. This form has a pink centered corona. There is also a red one. This species is a bushy plant and does not like too much water. Its foliage is pubescent and an odd character is that you can twist the leaves easily on their petioles. It blooms usually only once a year in the late fall (October in the USA) from nearly every node. It normally also drops the peduncles after blooming (A deciduous peduncle). There are only a few species with this habit and it is not absolute.

Second row right picture: This is *Hoya diversifolia* Blume. Picture sent by Kim Yap in Singapore. The species is widespread in SE Asia and seems to show some variation in the flowers. It is a low altitude species, sometimes found just at the high tide line along rocky stretches of a coast. It is a vigorous vine and a heavy bloomer if given plenty of room and a lot of light. Like *H. meliflua* above it oozes honeydew. The edges of the leave turn under a little and is one of the ways you might recognize this species out of bloom. It will live in one pot for years if well cared for. I had one in an 8" clay pot for over 20 years, never repotted and not top dressed. I just watered it and fertilized it occasionally!

Third row left picture: *Hoya pachyclada* Kerr. Picture sent by Partick Guzon, Manila, Philippines. This is a clean compact plant with large clusters of waxy white flowers. It's a survivor, easy to grow and care for, nearly pest free. The stiff thick glossy foliage is compact and makes a nice pot plant, easy to flower. It is a native to the regions around Thailand, found in mixed deciduous forests.

Third row right picture: *Hoya mindorensis* Subspecies *erythrostemma.* Maybe you just prefer to call it *Hoya. erythrostemma* Kerr, but there are only minor differences between the species and the pollinaria are near duplicates. These are nice plants, clean and with spectacular crowned flowers that come in many color variations. They all have keeled coronal lobes, which are nearly flat and meet in the flower center. Again, easy to flower and grow. Try several of these and enjoy the variations. Again a photo from Kim Yap in Singapore.

Hoya Photo Gallery



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Hoya tomataensis Green & Kloppenburg
Photo by Dale Kloppenburg

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Fraterna

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Our cover Story

New Central Sulawesi Hoya Species

Hoya tomataensis Green and Kloppenburg sp. nova Type 19086 (BISH) ex hort. Kaaawa, Hawaii. *Hoya camphorifolia* Warburg affinis sed crassifoliis, lanceolatis-ellipticis, obscurinerviis, basi angustatis vs. foliis perganaceis, ovato-ellipticis, nervis tertiariis reticulatis distinctis, basi rotundatis; flores ampli, diameter 1.2 cm. vs. 0.6 cm.; coronae apice externo acuta vs. haud recurvo obtuso differt.

Hoya tomataensis Green & Kloppenburg is like *Hoya camphorifolia* Warburg but different. The foliage is thick, lanceolate ovate, obscure nerved, base narrow versus foliage parchment-like, ovate-elliptic, nerves and reticulations distinct, base rounded; flowers larger 1.2 cm. in diameter versus 0.6 cm; external apex of the corona acute versus not at all recurved obtuse.

This hoya species was collected on 22 November 1994 by Ted Green in a nearly dry gully along the road between Tomata and Betelme on the way to Kolonadale Central Sualwesi. At this time the area was in a drought condition. The botanizing group stopped beside an abandoned, dried up rice paddy to collect cuttings of an Eriostemma from a dead tree on the north side of the rice paddy. This new species was found near the road on the opposite side. The species is a well-clothed dangling and climbing plant with opposite leaves and clear sap. Leaves are glossy, deep green with a waxy surface, lanceolate-elliptic with a short apiculate apex and hang essentially flat. The nerves are somewhat obscure but pinnate anastomosing. The leaf base is rather long angustate. Typical leaf is 10.7 cm. long x 3.8 cm. at the widest near the center. The peduncles are curved, relatively long, terete and not grooved above 2.5 cm in length and 0.36 cm. in diameter. The peduncles are lenticular with a few scattered hair cells. The rachis is a bracteate bloomer forming globose clusters of about 21 red flowers.

Data and photomicrographs follow

The bracteated end of the rachis from which the flower clusters are borne. This is enlarged about 16X. The peduncle is essentially glabrous except of an occasional hair cell, about 1.5 cm. long. Rachis as shown is knobby and each pedicel is subtended by an ear like bract with incised borders.

Outside view of the flower enlarged about 8X. The pedicels are glabrous 6.7 cm. long and 0.07 cm in diameter. Sepals reach about 3/4 the way to the corolla sinuses.

Pedicel, calyx and ovaries in side view enlarged about 16X. Pedicel near the calyx becomes granulose and slightly expanded. The sepals are narrowly triangular outside with a few cilia, otherwise granulose, inside shiny and smooth.

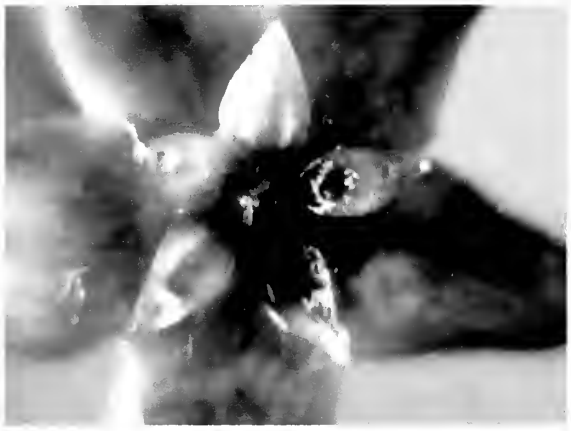
Ovaries are glabrous, shortly domed 0.10 cm. tall and base pair are 0.11 cm. wide.

Top view of a calyx enlarged about 16X. Sepals are a little overlapped at the base, not much thickened centrally. There are multiple ligules at the sinuses.

Apex - base	0.15 cm.
Apex - center	0.18 cm.
Widest	0.09 cm.

Outside view of the corolla enlarged about 8X. This surface is glabrous with scattered granulations. Corolla is cut about half way.

Sinus - sinus	0.32 cm.
Sinus - center	0.30 cm.
Sinus - apex	0.43 cm.
Apex - center	0.60 cm.
Widest	0.40 cm.

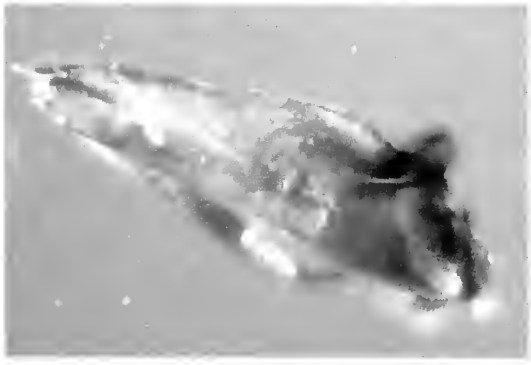


Inside view of the flower enlarged as above. This surface of the corolla is finely puberulous. Outer apices of corona reach the corolla sinuses.

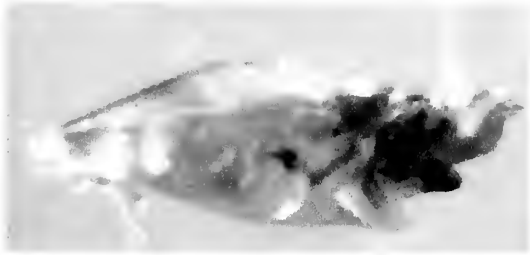
Bottom view of the corona enlarged about 8X. The sides of the scale curve under and overlap forming a covered channel just even with the anther wings at the sinus. The sides are diagonally finely sulcate. There is a short thickened column in the center 0.06 cm. tall. Anther wings are narrow and jut from the edges of the corolla. There are broad basal lobes that narrow as they approach the outer apex.

Top view of the corona enlarged as above. Inner lobes are dentate and do not reach the center. Dorsal is slightly concave with small linear umbo, sulcate with sharp edges, outer apex acute.

Apex - apex	0.22 cm.
Apex - center	0.27 cm.
Widest on top	0.10 cm.
Ret - ret.	0.08 cm.
Ret. - center	0.06 cm.
Aw. - aw.	0.15 cm.
Aw- center	0.12 cm.



Side view of a coronal scale enlarged about 16X. The anther is missing here and the raised inner lobe is not in sharp focus. The anther wings are not deeply curved. The whole structure is glabrous and waxy.



Top view of a single coronal scale enlarged as above. The dorsal surface is slightly concave with sharp edges along both sides. Here the anthers are projecting ahead of the inner lobe, anther wing below to the right. The inner lobe does not appear as dentate as it actually is.

Pollinarium enlarged about 165X. The caudicles with a digital microscope show up as clear yellow globs above the translator arms.

Pollinia		
	length	0.37 mm.
	Widest	0.16 mm.
Retinaculum		
	length	0.08 mm.
	shoulders	0.09 mm.
	Waist	0.06 mm.
	Hips	0.08 mm.
	ext.	0.04 mm.
Translators		
	length	0.05 mm.
	depth	0.03 mm.
Caudicle bulb diam.		0.04 mm.

Hoya tomataensis Green & Kloppenburg Photo by Ted Green

Five Favorites (Session Two)

By Ann Wayman

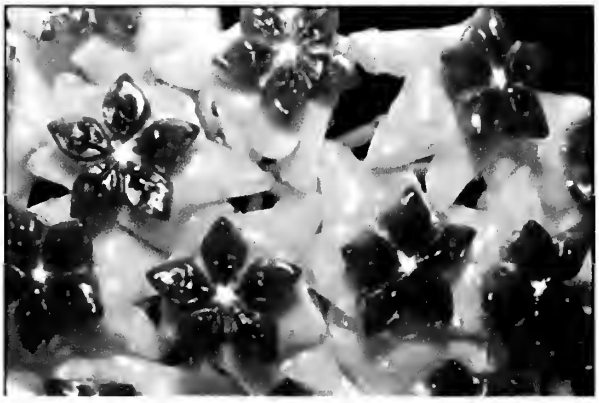
O.K. I got through the first five favorites, now comes the easy part of my next most favorite Hoyas. First I must look up the spelling and changes in names that have been made in the past five or six years. I always use Ted Green's catalogue from his web site (www.rare hoyas.com) for my reference.

Hoya cinnamomifolia Hooker

If what you want is really pretty and very striking flowers, this is a plant you must have. The leaves are big and bold and beautifully veined, though spaced quite far apart. I mask this rather naked look by training the vines on a 24 inch (or more) in diameter plant ring. The only drawback to this method is that it is almost impossible to repot a plant that has entwined around a plant ring for several years, so be prepared to take cuttings and then cut back the original plant to mere stubs with a few leaves left when it is absolutely necessary to

repot. The original plant will probably still bloom long before the new cuttings do, but it's always better to have a backup growing, just in case.

The flowers on this plant are so strikingly beautiful that when in bloom, they will be the first sight you see in a whole greenhouse full of flowering plants. The flowers are quite large for a hoya, extremely waxy apple green with a gorgeous crimson red corona, and last in perfect condition for up to 10 days. Unfortunately they do not seem to have any fragrance, or at least I haven't detected any. When this plant is in bloom, I run to the greenhouse many times a day to see if they're actually real.



Hoya cinnamomifolia Hooker Photos by Ann Wayman

Hoya dischorensis Schlechter

Another favorite is *Hoya dischorensis*. It has beautiful, large dark green, very clean looking foliage. A very reliable grower and bloomer. The blooms are tan or buff colored and very fuzzy with a white or yellowish corona. This has been a very consistent bloomer for me and usually blooms in spurts all spring and summer and sometimes even into fall. It will take a short nap in the dead of winter for a couple of months, then start its display all over again.

Hoya dischorensis Schlechter Photos by Ann Wayman

Hoya davidcummingii Kloppenburg

Ah, What a beauty!. This little plant was at first thought to be *H. gracilis* by David Liddle. I believe Dale Kloppenburg did some research and found that the plant did not match the herbarium sheet nor the original description. After some serious digging trying to find out what it was, he decided that it was a plant that had never been published. Now we all know that if Dale can't find it ...it just ain't there, so it became a new species with this new name. I'm thrilled to have it by any name. It's probably one of the most appealing of all the small growing hoyas. It has attractive dark green lanceolate leaves with purple edges, and grows quite full and dense.

The flowers are a big surprise, in that they are rosy pink with yellow tips and a white corona. The petals do not roll back sharply like most of the small flowered hoyas but fold only slightly, then tip back up like they want to cup, thus displaying the pretty yellow tips. This hoya blooms all the time for me...summer, winter, night and day, year after year. I keep expecting it to bloom itself to death (an old wives tale) but so far, it has never quit.

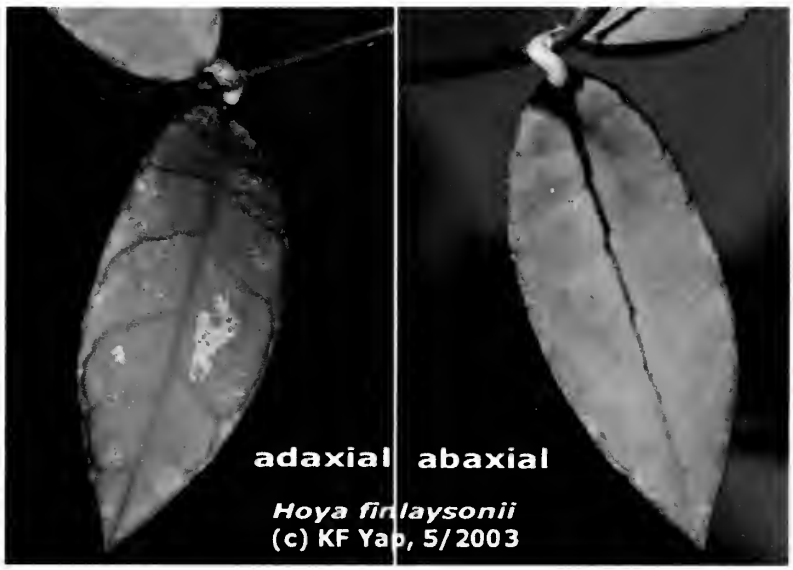
Hoya davidcummingii Kloppenburg Photographer unknown

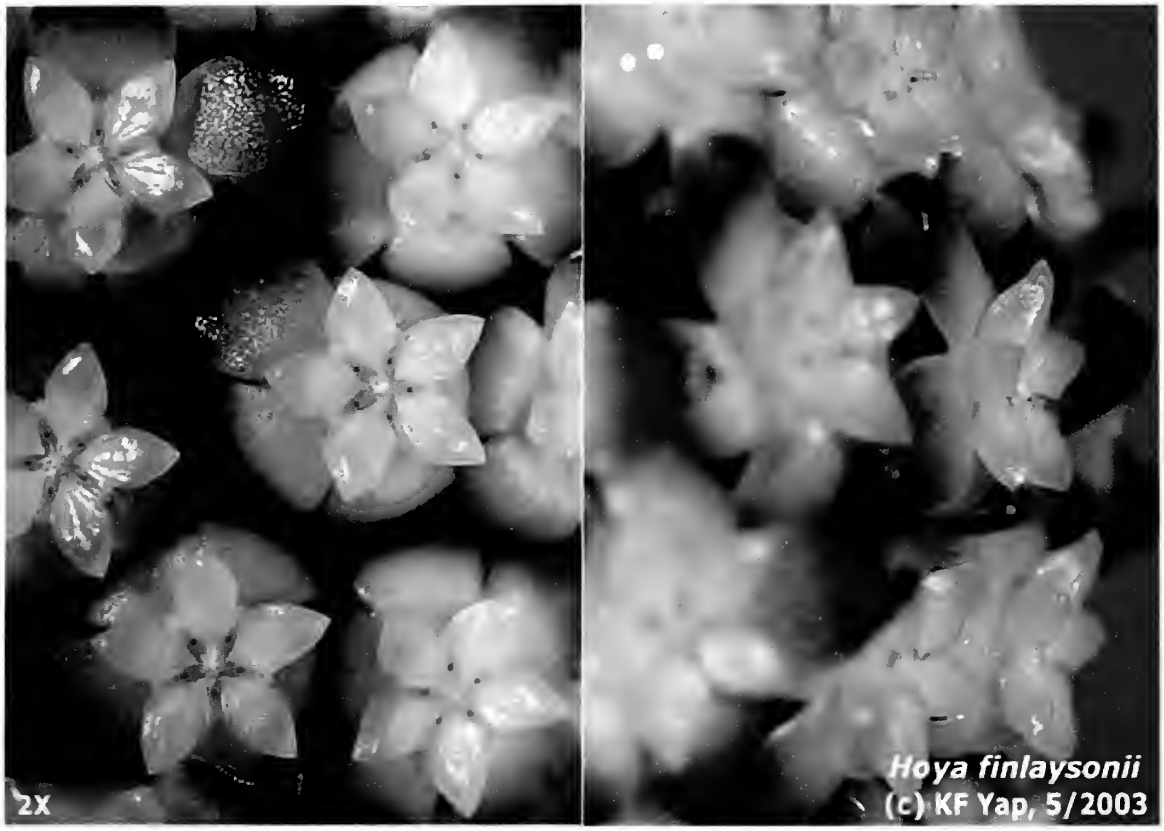
Hoya finlaysonii Wight

For foliage, beauty of flowers and a good all around growth pattern, this has got to be the ultimate foliage and flowering plant. The one stain on its' beauty is that the flowers are very short lived, remaining open as a rule only about twenty four hours. I have several clones of this species and some are better growers than others. The foliage is quite large and absolutely gorgeous, medium green in color with very dark green marbling. The flowers are small with many to the umbel. The petals are creamy yellow with bright maroon tips. This plant has been a very good grower and bloomer for me, though I have talked to some growers

who couldn't seem to get it to grow worth a hoot. The secret seems to be in getting a very good root system in a rather small pot before repotting into a larger size. I received a clone of this plant from Chanin Thorut of Thailand that has really outdone itself or perhaps it is a different species. The leaves look like *Hoya finlaysonii* and the flowers are identical, except that the entire plant including leaves and flowers are almost twice as large as any other clone that I have and the flowers can last up to 10 days. It also blooms almost constantly through spring and summer. In the spring I plan to send a cutting of this plant to Dale along with pickled flowers to get his opinion.

Following are pictures sent via E mail from Kim F. Tap, Singapore.





Hoya longifolia Wallich

This is a plant that I received some fifteen years ago with the label of *Hoya lanceolata* and a question mark. I don't even remember now who I got it from but it wasn't long before I realized that the leaves aren't even lance shaped and wondered how it had came to be called lanceolata. Maybe that was why the question mark. I struggled with it for a couple of years until I finally got it big enough to take some cuttings. I have found that cuttings from plants growing under my conditions will always do better than the original plant. My cuttings rooted very fast and within one month had put on new growth. They turned out to be very fast and strong growers and within a year I had four lovely plants with masses of very long leaves that grow in clumps. I had put in an order for some cuttings from Ted Green and among them was *Hoya longifolia.* To my surprise, when my order arrived the cutting of longifolia looked suspiciously like the *Hoya lanceolata* with the ???? marks. I grew them side by side and sure enough they all bloomed within a few days of each other with the same identical flower. I looked up a picture of longifolia in "The Hoyan" and determined that my plants were indeed *Hoya longifolia*. This has been a splendid experience for me in that this plant has turned out to be a real favorite with particularly unusual foliage and gorgeous flowers. It is also a very good bloomer with quite large, very fuzzy flowers that resemble *Hoya serpens*.

This is the five favorites for this time but be sure to catch our next issue of "Fraterna" for another of my five favorite hoyas...**as Jimmy Durante would say ("I got a million of em").**

Hoya longifolia Wallich
Photo by Dale Kloppenburg

HOYA MONETTEAE Green, (Asclepiadaceae) Sp. nova

Type: Tumarbong River delta, in mangrove swamp, 1 mile below bridge, Palawan Island, Philippines, T. Green 007, 4/11/00. Ex horticulture, Ted Green. # 007 (BISH).

Analysis Latin: *Hoya diversifolia* Blume affinis sed folio multus grandis 20cm x 10cm vs. 5-10cm. x 3.75- 7.25cm: flore amplus 2 cm. diam. vs. 1.3 cm. et succus liquidus vs. lacteus differt.

Analysis English: Allied to *Hoya diversifolia* Blume but differing in that the foliage larger 20 cm. x 10 cm versus 5-10 cm. x 3.75-7.25cm.and flowers larger 2cm in diameter verses 1.3cm, and with clear sap versus milky.

Description

A robust tropical vine resembling *Hoya diversifolia* in growth but with much larger leaves and stems; rooting along stems and at the nodes. Leaves opposite, blade ovate, glabrous, 20cm x 10cm, with sharp reflexed edges, base obtuse, tip apiculate, and pinnate venation; internodes to 27 cm. Petioles are curved, 5mm x 15mm. Sap is clear, in contrast to the milky sap of most hoyas.

The persistent peduncle arises between petioles at a node, 3mm x 3cm long; umbel semi-hemispheric bearing 15 – 35 white flat flowers. It is similar to *Hoya carnosa* in diameter, corolla and corona.

Seed pod, single or doubly pollinated, 1.5 x 15cm, green with some red dots.

Ecology:

Found both in the Southern Philippines and N E Sabah, Malaysia, either in mangrove trees or on limestone cliffs and rocks. It grows in anything from light shade to full exposure where it makes very large scrambling vines. It appears to like a basic pH.

It is not necessarily rare but not enough exploration has been done in the likely environmental areas.

Etymology

This handsome Hoya is named in honor of Monette Gilding, of Pearl City, Hawaii, a member of the discovery party and friend on several collecting trips to the Philippines and Sabah.

Photos by Farius and Ed Gilding. Microphotos and their analyses by Dale Kloppenburg.

Dale's microphotographs.

Species collected by a group at Tumarbong Falls, Palawan, Philippines in March 2000. The following pictures are from flowers sent by Edward Gilding, cluster of 22 flowers, pure white. Photos 10/9/02 film roll # 313 (14-35).

Peduncle enlarged about 8X. It is long, heavy 5.5 cm. +, glabrous, 0.42 cm. in diameter with a bracteated rachis. Sap clear. The surface is irregularly granulose.

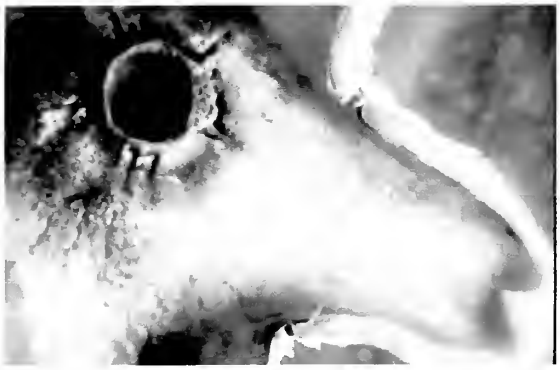
The rachis end enlarged about 8X. This is a bracteated rachis. The pedicels are subtended by curved ear like bracts with incised edges. This is not an umbel form of flower cluster. Here it was 1.5 cm. long, most likely the 2nd blooming.

Pedicel enlarged about 8X. They are uniform in length which gives rise to a globose cluster of flowers - 22 in this instance. Terete, glabrous, 3 cm. long, 0.13 cm. in diameter.

Calyx on the back of the corolla enlarged about 8X. The sepals reach about half way to the corolla sinuses. The sepals are diamond shaped with an acute apex. The corolla outer surface is glabrous.

Calyx with ovaries enlarged about 8X. The ovaries are glabrous, columnar shaped 0.20 cm. tall and 0.20 wide at the base pair.

Top view of a calyx enlarged about 16X. The sepals are overlapped at least 1/3, slick glabrous inside edges ciliate. Sepals are 0.20 cm. long, 0.25 from the apex to the center and 0.25 cm. at the widest. Note the multiple ligules at the sinus. Here the pattern is 1,3,2,3,1. Some ligules are as long as 0.05 cm.



Corolla outside enlarged about 8X. The central collar is raised and slightly thickened and glabrous as is the outer surface. Note the recurved inner apex, which is also glabrous. The sinuses are a little conduplicate.

Sinus - sinus	0.65 cm.
Sinus - center	0.55 cm.
Apex - center	1.00 cm.

Inside view of the corolla with corona attached enlarged about 8X. Corolla inside is white and densely pubescent. The coronal outer apex reaches the corolla sinuses. In the center under the corona the corolla is concave.

A bottom view of the corona enlarged about 8X. The lower scale side lobes form a channel and extend to the apex making it emarginate. The edges are rolled tightly under and are thickened. There is a central thickened column that raises the corona up off the corolla surface slightly. This underside is very distinctive.

Top view of the corona enlarged about 8X. The surfaces are glabrous. The inner lobe is spatulate and keeled from apex to apex down the center. There are flat shelf-like side lobes from the inner apex all the way to the outer apex visible from above to the widest portion of the dorsal surface (about the middle of the scale). Note the emarginate apices. The inner lobes do not reach the center where the membranous anthers are exposed.

Apex - apex	0.45 cm.
Apex - center	0.50 cm.
Widest	0.24 cm.
Ret. - ret	0.12 cm.
Ret. - center	0.12 cm.
Aw. - aw.	0.28 cm.
Aw. - center	0.26 cm.

Side view of a coronal scale enlarged about 16X. The dorsal surface actually slopes a little downward to the outer apex. Anthers rise above the inner lobe. Edges are rather sharp and there are two of these, the first arising inward a little from the inner apex and the second beginning about where the anther wings begin. B both extend to the outer apex (the two actually merge near the outer apex). This is what gives rise to the unusual lower surface of the corona. The outer apex is slightly turned up.

Pollinarium enlarged about 165 X.

Pollinia		
	length	0.60 mm.
	widest	0.20 mm.
Retinaculum		
	length	0.14 mm.
	shoulders	0.14 mm.
	waist	0.07 mm.
	hip	0.10 mm.
	extensions	0.03 mm.
Translators		
	length	0.07 mm.
	depth	0.03 mm.
Caudicle bulb diam.		0.07 m.

Ted Green
Green: Plant Research
Kaaawa, Hawaii

Hoya monetteae Green. Flower cluster.

Hoya monetteae Green, Seed pods

Photo Gallery Descriptions

Top row left picture: *Hoya whistlerii* Kloppenburg. This species was collected by Dr. Art Whistler on the island of Ta'ū, in American Samoa. The species has thick lanceolate glossy leaves of medium green color. Flowers are medium large (2.4 cm.), are cupped and inside finely pubescent and white with a slight pink cast. This species in the past has been listed as Hoya sp. Tau.

Second row right picture: *Hoya thompsonii* Hooker f.. Photo is by Eva Andersson, Sweden ?. This is a very striking flower of pure clean white even to the white waxy crown. This is an Indian species collected at Churra in the Khasia Mountains. If this is correctly labeled the leaves should be 1/2-1" long by 1/2" wide and rounded at both ends. I believe this species is easy to confuse with *Hoya lyi* Levelle.

Habitat pictures: These are photos I took in early October, 2003 in a collecting and study trip to Samoa. The one thing that immediately strikes a visitor is the beauty of a land of mostly green. The climate was mild at this time with an occasional warm shower at the higher elevations. I present these pictures to show that it is not always easy to pick out hoyas from the rest of the greenery.

Second row left picture: I suppose I should label this Hoya sp. unknown. It was easy to spot this as a hoya. Getting there was the problem. This was collected in Western Samoa at the side of a steep winding trail to Lake Lanatoo. The trail was slick with red clay mud and I was grasping anything to pull myself up. Here in the bend of the trail was this beautiful triplinerved hoya. Now I am waiting for it to bloom, maybe in a year or so.

Second row left: This was taken on Avala ridge above the town of Pago Pago (pronounced Pango) and its beautiful harbor. Here I am looking toward Fagasā (hidden bay). The old stump in the center has a hoya vine on it that was named as *Hoya chlorantha var. tutuilensis*. (personally I do not believe it is a variety of *Hoya chlorantha* but I am open to being convinced). There are many vines in the jungles and not all are hoyas. Even some with milky sap and opposite leaves are not hoyas. Look at the tree to the right a distance away and there is another species of hoya dangling from the limbs. It was impossible to get to that tree as the hillside is nearly vertical, muddy, slippery and a tangle of undergrowth and vines.

.

Third row left picture: One more hoya habitat. This one a bank on the side of a road. This is most likely a vine of *Hoya australis*, which was everywhere. Just because you can see it does not mean you can get to it. The bank may be too steep to climb. The vine may be out of reach and there are no long limbs nearby to try and wind around it to pull it down. It may be of interest that the speed limit here is 25 MPH and in some villages even as slow as 5 MPH.

Third row right picture: A picture taken on the way home from Samoa at Ted Green's, Kaaawa Hawaii. This is *Hoya kanyakumarinana* Henry & Swaminathan, a beautiful species from Southern India. It was named for the area where it was collected. This makes a nice compact small plant with unusual crinkled leaves and nice showy clusters of small flowers. Foliage is obovate, nearly obcordate. I feel this is an ideal basket plant for limited space.

Hoya Photo Gallery

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How do you like the photos that are put into each issue of FRATERNA these days! Would you like to see more? We certainly would if we could afford it, but let's face it---one of the most expensive things about putting out an issue of FRATERNA is having all those color photos in each issue. To offset those costs and allow more pictures to be added, we are actively asking our members to help sponsor a photo. This was very popular a couple of years ago, but in the last 18-24 months, we've seen a lack of interest ---probably because we didn't promote it enough. Let's rectify this! Send in your non-profit donation of $25.00-$50.00-$100.00 today! To: Membership Secretary, IHA, 1444 E. Taylor St., Vista, CA 92084-3308, USA. Through your generous support, everyone will benefit! Thank you.

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Hoya sigillatis Green
Photo by Ted Green

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Editor's e-mail address: rdk03@cvip.net

The President's Message

by Harriette Schapiro

It has been much too long since I wrote to all of you last. My broken arm at the end of 2002 did not help. However, I am back in action again.

As you may have noticed, there have been numerous species named and/or identified in recent issues of Fraterna, with many more color photographs and a few new names on articles. This means that we are going strong. I spoke to our editor today and he was in the midst of writing a new species "novum" description. More and more is known about hoyas every year. Despite the problems with printers and keeping the "presses" rolling, each issue of the Fraterna has more high quality color reproduction.

Ann Wayman, the founding editor of Fraterna, has written two good articles on some of her favorite hoyas with more planned. If any of you have a favorite species of hoya, we would love to publish your article on that species. There are always new members who have not had experience growing some of even the more common species, who would love to hear about your methods and growing techniques.

Have you noticed the articles by Eva-KarinWiberg? Her growing and collecting skills are impressive. If any of you are planning a trip to Northern Europe, make sure you plan to visit the nurseries to find out what is available and new to you.

While our membership is growing slowly, we welcome new members and hope that you think of a gift membership to friends who like hoyas.

Hopefully, the next year or two will bring me fewer problems and I will be able to write to you more often.

Dr. Harriette Schapiro, President I.H.A.

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Our Cover Story

HOYA SIGILLATIS Green (Asclepiadaceae) Sp. Nova

TYPE: Ex Hort, Tenom Agricultural Park, Tenom, Sabah, Malaysia. Original collection site unknown. From living collection, T. Green, Kaaawa, Hawaii, T. Green from deep shade, #91024 (BISH)

Latin: **Hoya sigillatis** Green sp. nova affinis *Hoya littoralis* Schlechter sed foliis formis et densis maculatis dorsaliter; retinacula non minuto, differt.

English: Allied to *Hoya littoralis* Schlechter but differing in the shape of the leaf and its heavily blotched dorsal surface and retinacula not minute.

Analysis: A tropical, thin stem, rambling vine, rooting at the nodes, with opposite leaves; blade 3.5-10cm long by 1-1.8 cm wide, elliptic with obtuse to cuneate base and acuminate tip, nearly obscured pinnate venation, upper surface matte, marked with silver (to pink) flecks and marks on a light green to pinkish-green base color, the under surface is green to bright rose-green, petiole 2 x 5mm, internodes average 8cm, peduncle persistent, 9cm x 1mm, bearing a flat umbel-like cluster of 15 – 20 flowers, 8mm in diameter, pale salmon and yellow flowers, on 6 - 24mm long x 0.08mm in diameter pedicels. Follicle not seen. Sap milky white. Fragrance indiscernible. Of the Acanthostemma section.

Etymology: Sigillatus (L), many marked, alluding to the many silvery flecks on the leaves.

Culture: Of easy culture when given warmth of at least 60° F and moderate to bright light (flecks on leaves become more prominent and upper leaf color more pink with brighter light). Plant in container with good drainage and support for climbing. A scrambler so keep confined on a trellis or wire hanger.

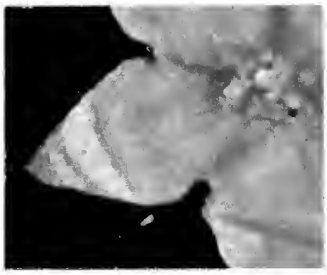
Although a shy bloomer, its attractive leaves and growth make up for this deficiency. This is probably one of the finest small hoyas for pot cultivation.

This plant has been offered in the trade as "Silver Flecked".

Ted Green
Green: Plant Research
Kaaawa, Hawaii

Photomicrographs by Dale Kloppenburg from flowers sent by Ted Green from Hawaii.

Pedicel calyx and ovaries enlarged about 8X. The pedicel and base to calyx have single-celled clear hair cells pointing apically. Calyx outside is granulose, inside shiny glabrous. Ovaries are 0.05 cm. tall and base pair are 0.10 cm. wide, glabrous, yellow.

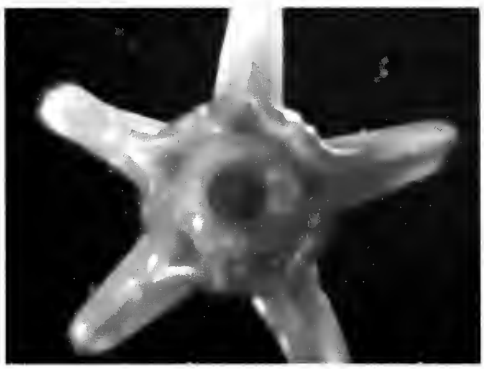


Inside view of the corolla enlarged about 8X. The outside is glabrous and granular. The inside has stiff short clear puberulance. There is some pentagonal thickening around the center under the crown that extends toward the corolla sinuses.

Sinus - sinus	0.40 cm.
Sinus - center	0.33 cm.
Sinus - apex	0.48 cm.
Apex - center	0.75 cm.
Widest	0.42 cm.

Side view of the flower enlarged about 8X. The crown sits up off the revolute corolla a little. The anther wings are relatively long and the sides are thickened and form a continuum with the lower anther edges. Crown center is a little raised and glabrous throughout.

A top view of the flower enlarged about 8X. Coronal lobes are relatively long and narrow, with well developed side lobes (bilobed). Inner lobes are rounded but do not reach the center; outer lobe ends abruptly between the bilobes.



Bottom view of the corona enlarged about 16X. As in *Hoya littoralis* Schlechter the channel on the lower lobes extends nearly to the thickened center and also the thickened and rolled material between the lobes is similar. The lobes are finely sulcate but not the rolled material in between.

Top view of the corona enlarged about 16X. All surfaces are glabrous.

apex - apex	0.30 cm.
apex - end	0.34 cm.
apex - center	0.34 cm.
widest (dorsal)	0.12 cm.
ret. - ret	0.09 cm.
ret. - center	0.07 cm.
aw. - aw.	0.20 cm.
aw. - center	0.17 cm.

Side view of a coronal scale enlarged about 32X. Anther exceeds the inner lobe which is rounded. Dorsal is slightly cupped with an elongated umbo in central portion. Outer apex turns down between the two side lobes that begin well below the inner lobe and extend beyond the outer apex and meet and curl up slightly at the end. Scale and lobes are finely sulcate longitudinally. Anther wing is not deeply curved.

The central white column with a domed top is the raised central stylar crown (not the stigma). In *Hoya littoralis* this is a conic structure. Here it is more ornate, almost capitate and glistening crystalline white. The yellow is a pollinium and to the right an intact scale.

Hoya sigillatis
Photo by Ted Green

My Five Favorite Hoyas (Foliage plants)

In this third session of favorite hoyas, I have decided to focus on some of the gorgeous foliage patterns of this fascinating genera of plants which have some of the most diverse formations of veining and marbling that can be imagined.

Hoya polyneura Hooker f.

Normally called the "fishtail hoya" by many hobby growers, this is among the most unusual of all hoya leaf shapes and veining, which looks exactly like the common name implies, "a fish tail". First, you must imagine fish with blue-green tails, very dark blackish green ribs with even darker green edges. Then add a few splashes of white, cut off their tails, stick them on a sturdy upright shrub and you've got H. *polyneura*. Although this is not an easy plant to grow, it can be accomplished with the right conditions and a lot of persistence. I have found that this plant is especially averse to being over-watered in the winter. A fairly heavy potting mix with an ample amount of washed sand added seems to be an almost ideal potting medium. This is one hoya species that I always plant in clay pots and place where I can keep a real close watch on them. They do not like to be completely dry, but cannot tolerate having wet feet for any length of time. This is also a very good bloomer and will start setting peduncles as a very young plant. The flowers are exquisite with snow white petals and a huge carmine red corona that is best viewed from underneath the plant, so it is best to hang them high. If you have them planted in clay pots, most garden centers have plant rings with a horizontal center ring especially for hanging clay pots There are usually five to six umbels of flowers opened several times a year with seven or so flowers to an umbel. I have not detected any scent from this hoya.

Photo by Ann Wayman

Hoya meridithii Green

Of all the fantastic plants with gorgeous foliage that have come into our collections in the past fifteen years or so, H. *meridithii* has got to be the most breathtaking of all. Big, bold and simply beautiful is the only way to describe this plant. The leaves can grow to twelve inches long and about six inches across and have a tendency to twist slightly as they grow larger, which gives a very pleasing and unusual look to this species. They are a striking lime green with extremely wide, dark green ribs, or veins to be more accurate! It's a real show-stopper and everyone who visits my greenhouse is immediately drawn to this plant. The flowers are rather small for such a huge plant-only being about 1/8 of an inch across. The umbel normally consists of twelve to fifteen of these small ivory-colored flowers but on a plant with foliage such as this...who needs em?!

Photo of the leaf by Ann Wayman

Photo by Ted Green

Hoya shepherdii Short ex hooker

The foliage on this plant is not especially pretty, just very unusual for a hoya. In fact it is very unusual for any genera of plant. I can't think of any other plant that has foliage even close to the leaf shape and growth of *H. shepherdii*. I love it because it is so different. Some others must think the same, as this is the only plant in my 27 years of growing plants that has ever been stolen right out of my greenhouse. Five large plants disappeared the same day. Fortunately, I did have one cutting that had rooted and from that one came all the plants that I have had since. This hoya is commonly called the "stringbean hoya" because the growth pattern of the leaves look very similar to stringbeans on a vine, except the leaves grow in clumps of five or more very long, leathery leaves that are at least four shades darker green than any other hoya that I have, and have no veins showing. Under optimum conditions this plant can grow very full and fill a pot with growth that comes directly from the roots. It doesn't branch much, but can grow to nine foot long and in each leaf axil there will be an umbel of approximately four to six cotton candy pink flowers with a fuzzy white halo around each petal. The flowers are very pretty which makes up for the plain look of the foliage.

H. shepherdii Short ex Hooker
Photo by Ann Wayman

Hoya compacta Burton

This plant could be something out of somebody's nightmare. Commonly called the "Hindu Rope Hoya" the common name contradicts the beauty of this hoya, or maybe it's a case of "Beauty is in the eyes of the beholder". It twists and curls into such tight clumps of leaves, that it looks truly tortured. I often wonder how it can even grow but grow it does, and magnificently! It also branches freely and the more it is pruned the more it branches until soon you will have a basket spilling over with long strands of tightly gnarled leaves, that are so dark green and glossy that they look like plastic plants. An added bonus is the gorgeous flowers. How do they do it?! How can they possibly bloom between such tightly curled leaves? It's a question I asked myself many times until I actually witnessed it happening. First you will see a tiny peduncle forming, then a clump of little buds form and as the buds get bigger they push the leaves aside until they are free from the cage of tight leaves. They will continue to enlarge and finally burst open into almost perfect globes of gorgeous pink or white blooms that look suspiciously like *Hoya carnosa* blooms. There are also two forms of variegation in the leaves of this species, one is green and white called *Hoya compacta variegata,* the other is a beautiful form of variegation consisting of green pink and white called *Hoya compacta Muana Loa.* There is one major drawback to owning this species and that is our major menace "The Mealie Bug". Mealies can and do get down inside these tightly curled leaves and set up shop "Big Time". I finally found a remedy that is not poisonous and works like a charm. It's a

very light oil spray by the name of "Eco-Oil" that I get from "Gardens Alive" If you are connected to the internet, go to www.gardensalive.com or call by phone (513) 354-1482. I have used this oil on every plant in my greenhouse with super results. It can even be used safely on the very fuzzy leaved plants that seem to breed their own mealies.

Hoya compacta Burton
Photos by Ann Wayman

Hoya pubicalyx variety chimera Merrill

No one can deny the elegance of one of the oldest in commerce and also one of the most beautiful of all the Hoyas, H. *pubicalyx*, with the common name of "Pink Silver Vine". This hoya was known for many years by the erroneous name of H. *purpureo fusca*. For glamour and all around great growth this species can't be equaled. There are many varieties and clones of this plant being sold in every garden shop, plant list and even in quite a few grocery stores. Even though the foliage and flowers are basically the same in most, there are a few exceptions. One might be the most extraordinary hoya of all and that is the variety known as chimera. The word chimera is listed in Roget's Thesaurus as a horror, a monstrosity, a nightmare, a delusion, a fantasy, an illusion, an apparition, an hallucination, and a mirage. If we go through this list of synonyms, none seems to fit except "fantasy", which converts very easily into the word "fantastic". Every plant in this entire species can grow into very large plants with many sizes and patterning to the leaves, all the way from plain green (a plant with the number D.S. 54 or 64) to grayish green with heavy white streaking and splashes (Grey Lady), to a solid blackish dark green with so many small streaks of white that the green is barely visible (Reva). Then there are the clones that the name "silver pink vine" came from which are streaked and splashed with pink and silver. Even though all of these varieties are absolutely beautiful, none can compare with the extraordinary coloring of the leaves and stems of "chimera" which can be green and maroon, green and brown and maroon, green and brown and pink and maroon and in

some cases, white, green, brown, maroon and pink all on the same leaf This pattern seldom consists of splashes of color but rather large variously shaped blobs of color. Have I mentioned the magnificent flowers on these plants? What I call the ordinary every day variety of this species all have quite large flowers that are either bright pink or deep purple with a beautiful white furry halo around each of the five petals. The chimera on the other hand often has at least two colors, usually two shades of the same color, such as pink and darker pink, or purple and almost blackish purple. I've even had some bloom with three different shades of color on the petals. Often they will have only four petals and four lobes to the corona (or crown) but always with that beautiful furry white halo on the petals. This is also one of the best bloomers in the Hoya family but needs some time in a pot (usually about three years) to initiate it's first blooms. Once it starts to bloom it will bloom practically non-stop for many years with just short periods of rest between flowering. Come back for another visit in the next issue of "Fraterna" where I will continue with more of my favorite hoyas. Ann Wayman

Hoya pubicalyx v.chimera Merrill
Photo by Ann Wayman

Hoya caudata Hooker f.

Photo by
Eva-Karin Wiberg

HOYA GROWER EXTRAORDINAIRE !!

An Interview with Eva-Karin Wiberg
By Gerald R. Williams/Charles H. Everson

One of our long-time members, Eva-Karin Wiberg, from Sweden, has consented to allow us to interview her and tell us how she came about growing hoyas, and to share with us some of her techniques and secrets to growing and photographing these beautiful plants. Her interest started about 18 years ago, and .....well, we'll let her tell you herself in a question-and-answer format:

Question: When—and—why did you get interested in growing hoyas? Answer: My initial interest started some 18 years ago (1986), back when I was growing African Violets. At that time, I had over 400 different varieties that I grew in my home. Then I read an article about a woman in southern Sweden who grew many, many hoyas. As I recall, there were a lot of hoya pictures in the article, and I got "stung" by the hoya bug! I contacted her and asked if there was any Society I could join. She gave me Dale Kloppenburg's address, and through him I joined the Hoya Society International, Inc. A few years later, the International Hoya Association was formed, and I became a member of that Society too. I bought my first hoya cuttings from Dale, and one of the cuts I received was *H. pubicalyx* 'Jungle Garden' Merrill. I still have this plant in my collection, and of course it is still one of my favorite hoyas. After seeing this hoya bloom, I was really hooked on hoyas.

Question: When did you form the Swedish Hoya Society: 'Hoyatelegrafen'? Answer: I formed this society in 1994, issuing the magazine quarterly. The first year we had 113 members. Now, I believe the membership is over 500. During the next 10 years I wrote two books, and one CD-rom about hoyas---all in Swedish. Last year, after authoring many articles in our magazine, and being the editor, and chief photographer and president for almost 10 years, I handed the reins over to the very capable Torill Nyhuus, who is doing an admirable job, producing an even better magazine with more and more beautiful pictures in every issue.

Question: Why do you have such good luck growing hoyas? What is your secret? Answers: I don't know if I really have a secret in growing hoyas. My husband built me 2 shelves to grow my African Violets on, with lights. Then when I started growing hoyas, I threw out all my African Violets, putting my hoyas under these light stands. They seemed to like it, growing rapidly, and flowering rather quickly and early. My shelves are near windows with a lot of natural light coming in, and the hoyas seem to thrive there. So I will tell you that if you have limited space, a few windows to grow hoyas in, please build shelves and puts some lights in them to grow hoyas in. You will be rewarded ten-fold!

Question: Do you feed your hoyas regularly? Answer: Because I don't give my hoyas as much care as required, I make up for it in adding a product called 'Super Thrive' every time I water. Maybe my secret is in this product that is filled with hormones and vitamins. I don't know. I used to buy this product from a firm in the U.S.A. called 'Jim's Orchid Supplies' (website is: www.jimssupplies.com). If you haven't tried this product, I highly recommend it.

Question: What kind of camera do you use? Answer: I use a very cheap digital camera, but I get good results. It is a Fuji MX-1200, with 1.3 megapixels. Maybe I will buy a new camera soon with more megapixels so that I can get more beautiful and larger photos. My youngest daughter, Linda, is very much in to photography, so I may give her my 'old' camera then.

Question: How many times have you been to the Far East to look for hoyas—where did you go—when—and who were your traveling companions? Answer: I've been to the Far East four times since 1995, searching for hoyas. My first visit (1995) was to the Philippines with Dale Kloppenburg, Ted Green, Jerry Williams, and Ed Gilding (all I.H.A. members). We traveled extensively there, and I found 50 different hoyas--at least I thought so, until they bloomed. We also found some new hoyas. One that we found on the island of Palawan was later named after me: *Hoya wibergiae* Kloppenburg which pleased me very much. It's a very nice one, green corolla with a white corona and a red eye. It also has a very nice fragrance and beautiful foliage. But back to the trip---being my very first trip to the Far East, searching for hoyas, with hoya companions was like a shot in the arm for me, and for wanting to travel again, and again, and again! My travel companion, Ted Green, is the one who urges me to go every time he plans a trip. We've even been to Borneo twice to look for hoyas! But I must tell you about my last trip----the most exciting! Along with Ted Green, David Liddle, Brian Gray and Torill Nyhuus, we went to Sumatra, Peninsular Malaysia and the Tioman Islands in October-November 2002. This trip was more exciting than I could ever have imagined! We walked many, many miles, camped out in the jungles, even saw a family of Orangutans eating----Mother and baby. I also got bitten by a leach on my left thigh, that wouldn't stop bleeding. This was the most exciting trip I have been doing since I gave birth to my daughter, Linda (born June, 1990) in the backseat of our car---by myself---as a nurse!!

Question: Are you planning on going on another hoya trip? If so, where to this time? - Answer: One can always plan, and I ALWAYS do, but I need money for traveling, and since I'm not currently employed, it isn't always easy to raise that kind of money. I have a big family, husband, 4 kids all living at home. But---if I could raise the money for a new trip, I would probably want to go someplace where I haven't been to before. Maybe India, or Thailand, or some place in the Philippines that would be new and exciting---there are so many islands there. The Philippines and New Guinea have the most hoyas growing in their country.

Question: And finally, Eva-Karin, what would you consider your 5 favorite hoyas, and tell us why you like them? Answer: My favorite hoyas always change as new ones bloom. But if I have to give you ONLY five, this is who they are: Hoya *chlorantha* Rechinger --*Large* green flowers, blooms all the time for me. *Eriostemma (Hoya) subcalva* Burkill --Large orange-pink flowers, with a lovely fragrance like that of chewing gum. *Hoya cystiantha* Schlechter (Hoya campanulata)--Lovely lemon-white bell shaped flowers with a strong fragrance of strong lemon; blooms almost year round for me! *Hoya caudata* Hooker f. --Lovely white, hairy flowers with a red corona. And one of the nicest foliage hoyas I have. *Hoya engleriana* Hosseus --The foliage is like rice, and the flowers are like *Hoya bella* Hooker, but the flowers last for over 5 weeks for me! Very nice.

The following photos are by Eva-Karin Wiberg

Hoya albiflora Zipp.ex Blume

Hoya engleriana Hosseus

Hoya x Kamuki (macgillivrayi x archboldiana)

Hoya lobii Hooker

Hoya sp. Borneo

Hoya patella Schlechter

Eriostemma subcalva

Hoya verticillata (Vahl) G. Don

by Dale Kloppenburg

I have been working on Vahl's material for 3 years now. The foliage of the two Type sheets of Vahl's species look so different from any of the hoya species said to be in the *Hoya parasitica, acuta pallida* group that I has hounded me. I obtained flowers and foliage from Vahl's type material and worked on it diligently, actually amassing 52 pages of data in this regard. I find the sheets were not properly identified when they were called *Hoya parasitica* (Roxb.) Wall. ex Wight. Vahl's material is not that species by any stretch of the facts.

Here are some of my findings.

1) Vahl's two species (verticillata and opposita) are not identical.
2) Neither are *Hoya parasitica* species (nor any of its synonyms).
3) Corona and corolla of *H. verticillata* are smaller then *H. parasitica.*
4) Coronal scales dorsal surface is keeled vs. concave.
5) Corolla inner surface is pubescent vs. glabrous (by most accounts).
6) Leaves are much smaller 5-7.5 cm. x 3.1 cm. vs. 7.5 - 17 cm. x 3.7 - 7.5 cm.
7) Leaves nervation 5-7 pairs of anastomosing netted vs. 3-5 tuplinerved.
8) Corolla conduplicate (rolled at the sinuses) vs. not conduplicate.
9) Calyx small, broadly triangular vs. linear.
10) Pollinia shorter, 0.29 mm. vs. 0.48 mm.

In the next issue I will show some of the pictures of this finding. I will, if space allows, discuss pollination of hoya flowers. The later article arises from my interest in seed pods that have flowers remaining on the pod after development. This study has been from pods in my own yard and pods sent to me over the years by Erwin Davis, Corona California, a long time IHA member

Hoya seed pods with flowers still attached. This allows one to study how a pod was formed, pollinated or not and how the pollinia are arranged to pollinate the flower and thus form the pod.

Photo Gallery Descriptions

Top row left: This is a photo of *Hoya australis R.* Brown ex Traill collected on the south side of Upolu, Western Samoa in 2003. This species is all over the Samoan islands, mostly at low elevations, even in the ocean salt mist up to about 300' elevation. To me the most interesting thing about this species is the very wide divergence in leaf size, shape and surfaces. Some are small almost round with a lot of pubescence all the way up to these huge leaves, which are glossy green in color. No wonder some were considered different species. If I ever collect again there I plan to take cuttings of all the different types and really study them.

Top row right: A photo by Torill Nyhuus, Sweden of *Hoya vitiensis* Turill. This species is native to the Fiji Islands. This is a beautiful hoya species with velvety corolla, usually with 12-15 flowers in a cluster. The ones I have seen in bloom in the past have been a wine color. It is evident we have several clones of this species in our collections. The holotype was collected near Nandarivatu, Viti Levu in 1906 and is in the Kew Herbarium, England.

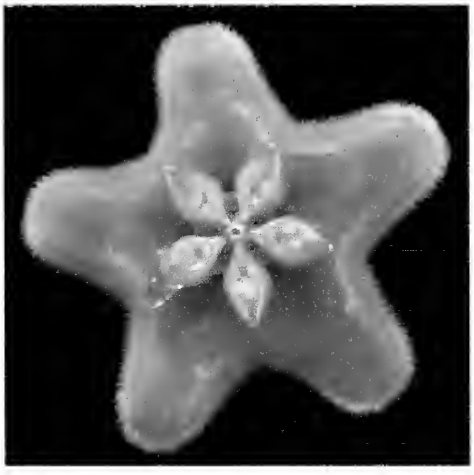
Second row left side: This is a digital photo of *Hoya incrassata* Warburg as it bloomed here in Fresno, California in the fall of 2003. This is a very tight flower cluster with short pedicels. It has an intense spicy fragrance so you will not miss the flower in bloom even out in the yard. It has nice large leaves, a well clothed plant and vigorous and easy to grow and bloom.

Second row right side: Another photo sent via e-mail taken by Torill Nyhuus, this one of *Hoya buotii* Kloppenburg. This is a new Philippine species recently published. This one for me is a little difficult to grow. Maybe because I have not yet learned its needs. The flowers are pubescent on the inside with a somewhat cupped flower in the beginning, later the corolla lobes roll under and the flower is more flat. The corona has raised outer corona lobes and with the red center is really a show piece. The foliage is glossy green, leaves elliptic with a long tapering apex, rostrate like.

Bottom row left: Once again a beautiful flower picture by Torill Nyhuus, this is one of *Hoya dischorensis* Schlechter. Isn't this a real beauty. A ring of velvet pubescence around a perfect yellow corona. Dr. Schlechter discovered this one in the Dischore Mountains of New Guinea blooming in June 1909

Bottom row right: A composite picture by another excellent photographer. Kim F. Yap, of Singapore. This photo also sent via e-mail as titled is of *Hoya plicata* King & Gamble. This is a bilobed species (Acanthostemma Section). It has deep dark green lacunose foliage and clusters of reflexed to revolute flowers. It is a hardy plant easy to maintain. This one was collected recently in Malaysia, grown and flowered in Singapore.

Hoya Photo Gallery



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How do you like the photos that are put into each issue of FRATERNA these days! Would you like to see more? We certainly would if we could afford it, but let's face it---one of the most expensive things about putting out an issue of FRATERNA is having all those color photos in each issue. To offset those costs and allow more pictures to be added, we are actively asking our members to help sponsor a photo. This was very popular a couple of years ago, but in the last 18-24 months, we've seen a lack of interest ---probably because we didn't promote it enough. Let's rectify this! Send in your non-profit donation of $25.00-$50.00-$100.00 today! To: Membership Secretary, IHA, 1444 E. Taylor St., Vista, CA 92084-3308, USA. Through your generous support, everyone will benefit! Thank you.

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Hoya memoria Kloppenburg
Photo by Torill Nyhuus, Sweden

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Errors of fact may occur from time to time in "Fraterna". It is the policy of the IHA to publish corrections of fact, but will not comment on matters of opinion expressed in other publications.

Fraterna

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Our cover Story

Hoya memoria Kloppenburg sp. nova

In commerce we have a species sold as *Hoya gracilis*, which was collected by Dale Kloppenburg and Ted Green from the Manila, Philippine Memorial Garden in 1981. It was collected growing on the aviary fence (more than one species on the fence). It had been planted out after establishment in the nursery from native material collected by Blas Hernaez, Los Banos, Laguna, Philippines. It was wrongly said by Burton to have come from Ceram and given to the garden by Peter Tsang's brother. It was not this species if there was one from Ceram. I have for years written to confirm this assertion and find it false. This species is a Philippine species somewhat common in the Southern Philippines. It differs from Schlechter's species in many ways but is easily separated by the size of the translators.

Varieties and subspecies: A. D. E. Elmer in Leaflets of Philippine Botany 10 (1938) 358 describes a Philippine specimen as follows: "*Hoya gracilis* Schlechter. Forming mats upon branches of *Quercus pruinosa* Bl. growing in damp woods at 4000 feet elevation; stems rigid, numerously branched, green but ultimately turning brown; leaves spreading, rigid, thick, pale or yellowish green beneath becoming softer and wrinkled with age, deep green and grooved upon the upper side occasionally turning reddish; inflorescence upon descending terminal stalks; pedicels curvingly deflexed, nearly red; flowers pendent, deeper red, odorless and also rigid. Apuntulibung in Bagobo. Number 10482 collected by Elmer at Tadaya.-- This determination may not be correct when compared with the type of Schlechter's Celebes plant."

Comments: Elmer's sheet #10482 at (BO) has relatively narrow long leaves, certainly not conforming to Schlechter's Celebes type for *Hoya. gracilis* Schlechter. In addition there is a sheet #32378 collected by McGregor in 1918 at Antigua Province, Panay, Philippines, labeled *H. gracilis var. philippinensis* with foliage narrowly ovate, most with rounded bases and acuminate apices. The foliage is very different from Elmer #10482 and also different from Schlechter's *H. gracilis.*

I have not found a single herbarium sheet of Philippine hoya species that appears to be a variety of *H gracilis* Schlechter. Many sheets labeled as varieties of this species are not even in the Section *Acanthostemma* (Bl) Kloppenburg. For example, sheet #14203 (1951) PNH from Victoria Mts. Palawan; Ramos & Edano #45478, #455477 (UC): Britton #19519 (1953) PNH; Fox #5023 PNH; Ramos & Convocar #93890 PNH Dinget Is. Mindoro all fall into this category. It is doubtful in my opinion that any of the herbarium material collected in the Philippines is this species or even a variety of this species. I have yet to examine a fertile Philippine herbarium sheet labeled *Hoya gracilis* Schlechter or *Hoya gracilis var. philippinensis*, including all those housed at PNH, CAHP, BO or UC, that is even in the same section. All the sheets with flowers can be determined, but until DNA typing can be carried out on sterile sheets we will be unable to identify these with certainty. There may be more than one species involved in this Philippine collected material. Most of what I have examined belongs in the Section *Otostemma* (Bl.) Miquel, and is not a described species.

Hoya memoria Kloppenburg sp. nova. Typus 81074 (UC) collected 1981, at the memorial Gardens, Manila, Philippines, ex hort. Carolyn Unruh, Kingsburg, California. *Hoya gracilis* Schlechter affinis sed calycis segmentis ovatis ciliatis vs. oblongis obtusis glabris; corolla intus pubescenta ad villosa vs. papilloso-puberula. Translatoribus longus (0.12 mm.) vs. subnullis differt.

Hoya memoria Kloppenburg a new species type 81074 (UC) University of California Herbarium, Berkeley, California, collected in 1981 at the Memorial Gardens, Manila, Philippines, from horticulture Carolyn Unruh, Kingsburg, California. Similar to *Hoya gracilis* Schlechter but the calyx segments (sepals) are ovate ciliate verses oblong obtuse, glabrous; the corolla inside is pubescent to villous versus papillose-puberulous. Translators are long, 0.12 mm, versus almost lacking.

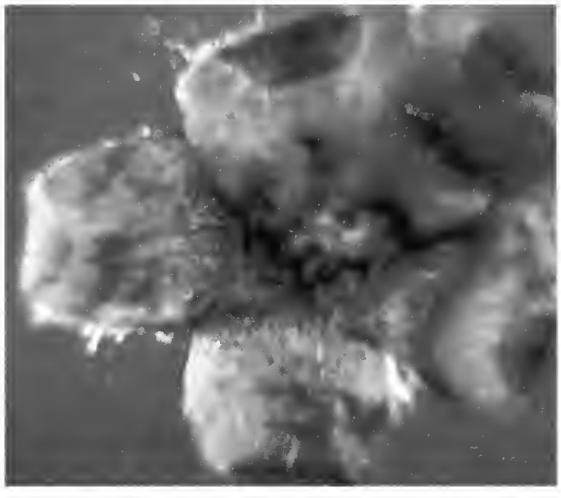
Photo of the flower cluster. Photo taken by Ann Wayman of Central Point, Oregon.

Photo of the pedicel, calyx and ovaries enlarged about 8X. Pedicels of various lengths but longest 1.5 cm. long, 0.10 cm. in diameter, with a few scattered hair cells curved toward the apex, otherwise glabrous. The calyx base is expanded into a semi-globe also with some hairs and granulose surfaced. Calyx lobes oblong obtuse 0.15 cm. long and wide; diameter of calyx 0.36 cm. Ovaries glabrous, short, semi-bottle shaped, 0.15 cm. tall and 0.07 cm. wide at the base pair.

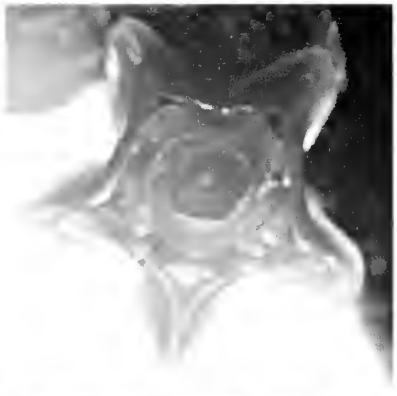
Top view of the calyx enlarged about 8X. The sepals are broad ovate, hyaline, glabrous inside, many hairs outside but few are edge hairs (cilia). There are long ligules in a pattern here of 2-1-0-1-1. The overlap of the sepals is nearly ½. Pedicel is glabrous.

Corolla outside surface enlarged about 8X. This side is glabrous with a raised central collar. The surface is granulose.

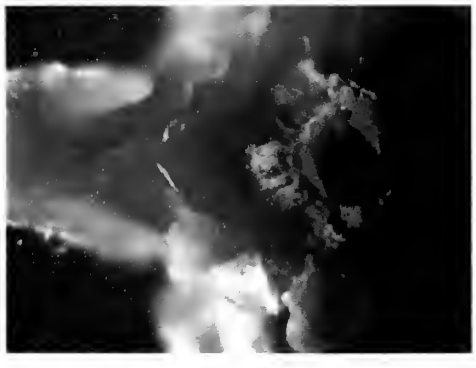
Sinus - sinus	0.25 cm.
Sinus - center	0.15 cm.
Sinus - apex	0.36 cm.
Apex - center	0.58 cm.
Widest	0.25 cm.



Inside surface of the corolla enlarged about 8X. This surface is pubescent almost villous at the corolla lobe bases. There is a small triangular apical area on this upper surface that is glabrous. The collar is also raised on this surface. The corolla at anthesis is revolute.



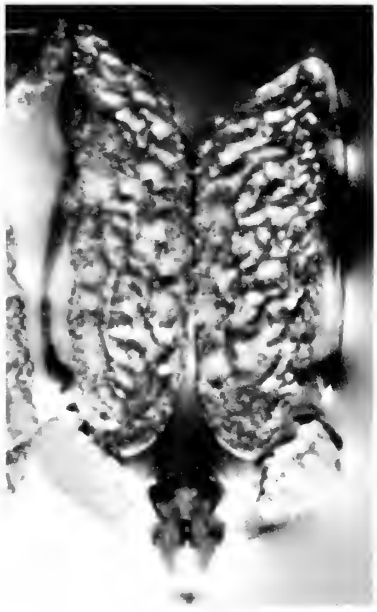
Bottom view of the corona enlarged about 8X. It is channeled with the side material being sulcate. In the center is a thickened, rather large column. There are double swollen protrusions at the base of each channel, which is unique. I have never observed this on another hoya species. The curved bottoms of the bilobed extensions continue and are thickened to the anther wing slots. I'd say this is a precursor to development of the skirt found in Section Otostemma species. The central column is thickened but relatively short.



A greatly magnified area of the bottom of the corona. Channeled portion of one lobe is to the left. In the center of the channel opening, where the edges of the bilobes curve out to proceed toward the anther wings, is this fleshy obtuse ended structure with side wings projecting from the central column. There is one at this position on each lobe base.

View of the corolla and corona enlarged about 8X. Inner lobes are raised in the center. They are long and narrowly spatulate. The outer lobe is humped in the center (dorsal surface) as an extension to the inner lobe outwardly. On either side are the rounded edges of the outer lobe itself and outward from here are the shelf like bi-lobes. They extend beyond the almost acute outer apex of the scale and meet in a line along their extended ends. The corolla is glabrous outside, revolute inside, pubescent except for a small apical triangle. The stylar crown is raised, apiculate.

Apex – apex	0.26 cm.
Apex to center	0.28 cm.
Outer lobe to inner apex	0.30 cm.
Widest dorsal surface	0.15 cm.
Ret. - ret.	0.05 cm.
Ret. - center	0.05 cm.
Aw. - aw.	0.14 cm.
Aw. - center	0.20 cm.



Pollinarium enlarged about 165X. The retinaculum of this species is relatively small but here the translators by contrast are large. This is a small pollinarium.

Pollinia	
length	0.30 mm.
widest	0.11 mm.
Retinaculum	
length	0.05 mm. without the extensions.
shoulder	0.05 mm.
waist	0.04 mm.
hip	0.05 mm. +
extensions	0.04 mm. strong, well formed
Translator	
length	0.12 mm.
deepest	0.04 mm
wide	0.02 mm.
Caudicle bulb diameter	0.06 mm. tear drop shaped.

The pollinarium is near that of *Hoya odetteae* Kloppenburg, but the retinaculum is smaller in *Hoya memoria*. It is also similar to *Hoya brevialata* Kleijn & Donklaar but slightly smaller.

This plant is a lax dangler with long streamers. Glabrous branches with leaves.

This species is not *Hoya litoralis* Schlechter, as it is different in several key characters, including calyx shape, flowers size 1/2 the size, bi-lobe lengths, and most critical the translator shape and size. IML 708 from Moa Is, Torres Str., Australia is also not *H. litoralis.*

In Sweden it goes under the name *H. inconspicua.* This species I have collected in the Solomon Islands and although Forster and Liddle have lumped this specie, *H. litoralis* and *H. revoluta* together, I find them very different in many respects. *H. inconspicua* has flowers larger than *H. litoralis* but still smaller than this new species. The translators again are different and distinct. The ovaries and sepals are different. The corona does not have protrusions on the lower surface.

++

Spider Mites in Singapore

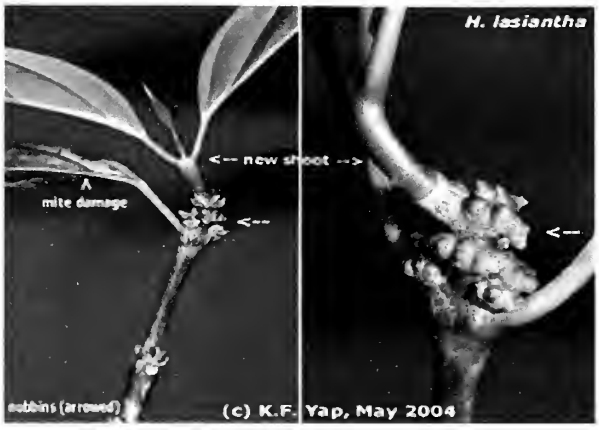
By Kim F. Yap

Hi Hoya Joyas & Plant Lovers

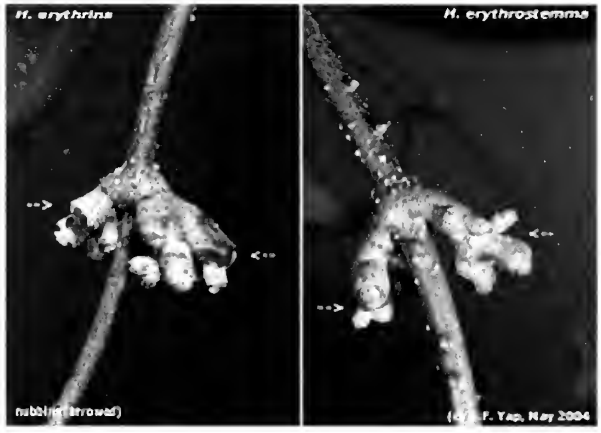
Here are some observations of mine, which I would like to share with you. All this happened during the hot dry season last year when I found that some of my hoya plants were not doing well at all. I did not find the usual sucking pests (scales & mealy bugs) on them, yet they were not growing normally, not producing stems & leaves, flower buds were abscising before they bloomed, young leaves were turning yellow & shedding. Things were just not right with some of the plants. I finally found the cause.

The sickness was caused by a tiny little pesky called red spider mites. My hoyas are feeling a lot better now after intensive treatment with the systemic insecticide, Dimethoate. The attached article & pictures tell all. The pesky little mites affects <u>most plants</u>. If you grow anything at all, watch out for them. Get rid of the peskies or lose your plants!

Cheers, Kimosabe.



Photos by Kim Yap of spider mite damage to hoya plants during a dry spell in a otherwise tropical country. The growth is deformed and gnarled



More of the same here caused by spider mites. They thrive in dry, low humidity conditions.

After treatment and elimination of the mites the new growth is normal.

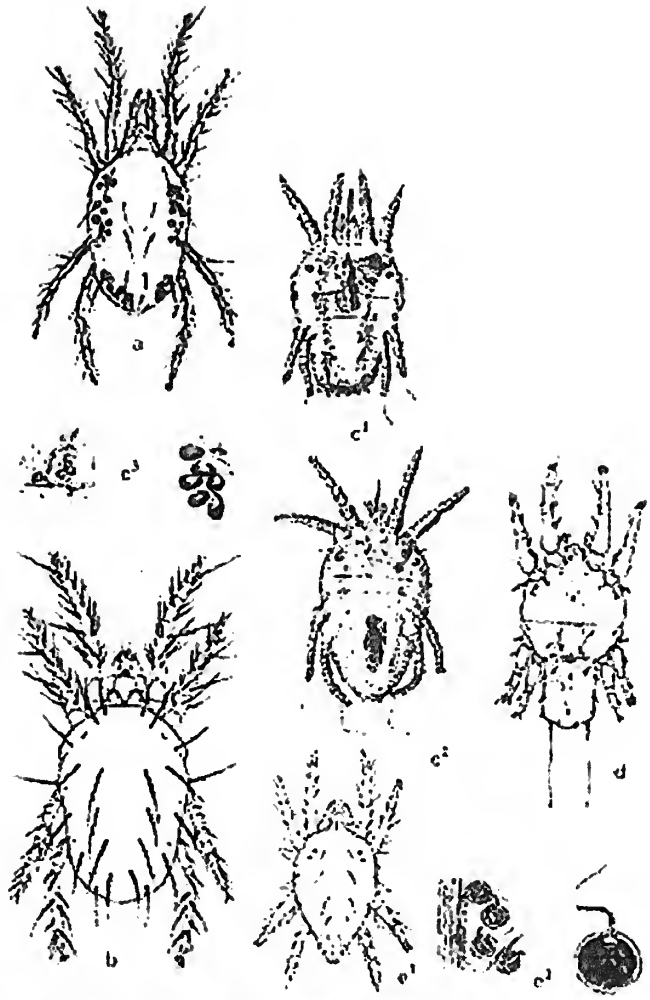


Fig. 21. Tetranychidae. a, *Tetranychus cinnabarinus* ♀; b, *T. urticae*; c, *Brevipalpus obovatus*; c^1, ♀, c^2, ♂, c^3, eggs; d, *Tenuipalpus orchidorum* c^1. *Oligonychus coffeae*, c^2, eggs (enlarged).

Different species of spider mites along with their egg masses. Picture sent via e-mail from Kim Yap in Singapore.

Disease in Thin Leafed Hoyas

If your **Hoya campanulata, Hoya lasiantha, Hoya dennisii, Hoya multiflora** and many of the other thin leafed hoyas have developed a silvery pink film on the undersides of the leaves, you are in trouble for they have been infected with Red Spider or Mites. Another indication is crippled, disfigured, wavy leaves and aborting of buds.

Kim Yap, of Singapore, pointed this out in one of his e-mails and woke me up to the fact that some of my plants that weren't doing well were infected. He asked if I knew of an alternate treatment to what he was using –the systemic insecticide, Dimethoate.

I have found that **Bayer's Rose and Flower Insect Killer**, a formulation of Cyfluthrin and Imidacloprid, a wonderful broad-band, over the counter product for Thrip, several Scales, Mealy Bugs and now Red Spider and Mites really does the trick. Although not specifically recommended for Hoyas, it does not burn or cause disfigurement of the leaves and does not cause me trouble when I spray it. **As with all sprays, mix and apply it strictly as recommended by the manufacturer.**

Thank you Kim Yap!

Ted Green
Green: Plant Research
Kaaawa, Hawaii

TISSUE CULTURE UPDATE

Several years ago, I did an article on raising Hoyas from tissue culture (See Fraterna Vol. 15 #2:15-17). That was a beginning, and since then I have tried to raise newly collected material of some of the rarest things, in the lab. It is not easy – I think the gods are against me!

As I have said before, I bring back only small collections of each species so to save them I start them in the usual manner. I have pretty good luck that way but I want a back-up in case something goes wrong so I try taking the tip of the newest growth and put it in the lab. That is the risky part for to introduce it into a sterile test-tube it must be sterile. The small tip must be cleaned and I do that with 20% Chlorox. Usually, 15 minutes in 20% Chlorox, with a good rinse of sterile water cleanses the material without killing it – USUALLY, I said. It seems that the rarest (and in short supply) explant gets killed in the decontamination, or the medium is not right.

The reason for this up-date is that I found something interesting. **Hoya (Absolmsia) spartiodes** in nature produces leaves when it starts out as a seedling but once established, the leaves abort and the photosynthesis is carried out in the persistent flower peduncles.

Noticing the scarcity of the plants in Sabah, I thought that it would be interesting to mass produce it in the lab and then re-introduce it back into nature. That was 13 years ago, and "the best laid plans" got sidetracked until a few months ago when I put a bit of one plant into tissue culture. Everything worked perfectly – clean up, and the correct medium (Sigma MSMA Multiplication Medium), with no contamination and the plants exploded. They started growing within several weeks and within a month were proliferating BUT they acted like seedlings for all of the new growth had beautiful leaves – that did not abort. No peduncles.

The medium that I use is for proliferation but in the case of the **H. spartiodies**, the plantlets are producing roots so that eliminates the rooting stage so they can be planted out directly into NZ moss, in a small clay pot.

It works! so, maybe on my next trip back to Sabah, I will try re-introducing some of these lab-cultured plants into nature.

Pictures:

In nature = H. spartiodes (upper right)
In pot = H. spartioides (upper left)
In test-tube = H. spartioides in culture (lower right)

Ted Green
Green: Plant Research
Kaaawa, Hawaii

Seed Pods and Pollination

by Dale Kloppenburg

In the previous issue of Fraterna I showed a picture of hoya pods with flowers attached to the ends and promised to write you about my study on these pods.

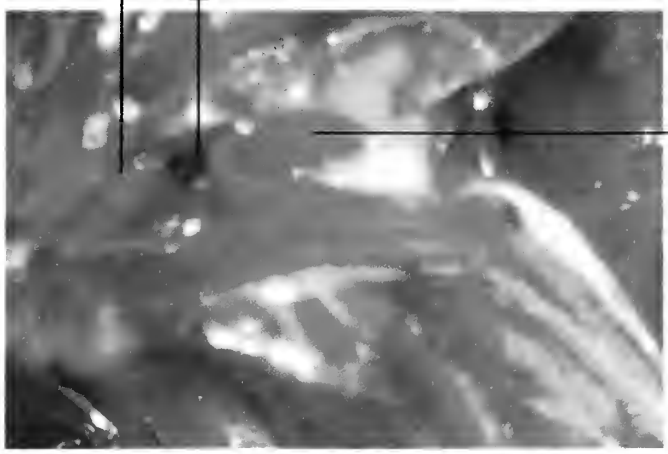
For over ten years now I have been studying the flowers that sometimes remain on the ends of hoya seed pods. I hoped to learn something of how hoya flowers are pollinated. Here in Fresno, California I only have had pods set from early spring bloom. I attribute this to the cool and more humid weather at that time of year. After spring Fresno becomes hot and the humidity can fall to 5% and I have never found a pod under these conditions..

In the first 3 years I was able to find 9 pod flowers on the ends of developed pods. These were removed and soaked in Kew Solution to bring them back to near normal. Of these first pods only one had been pollinated and this by a lone pollinium of the same species laying on top of one of the 5 in place retinaculum. It had germinated and the pollen tubes grew into the stigmatic surface below. The other 8 had not pollinarium out of place or disturbed and no foreign pollinia present.

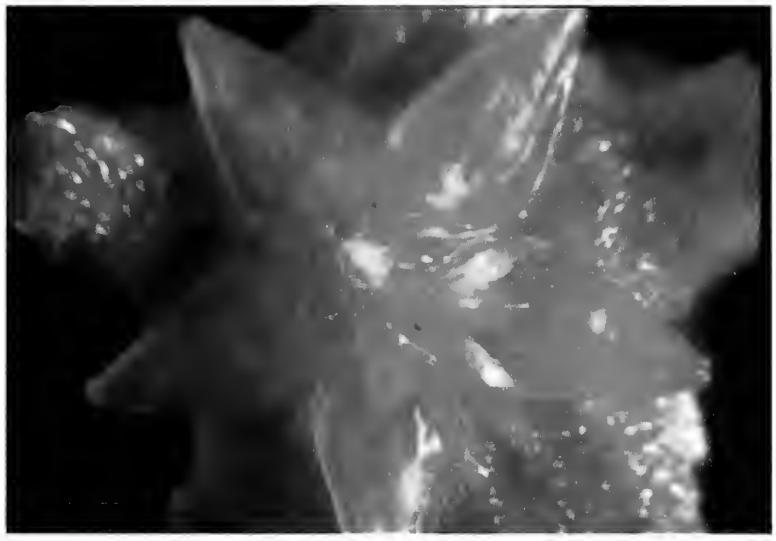
My conclusion from these observations was that the majority of seed pods arise from parthenogenesis (non sexual development).

In the past 6 years Erwin Davis of Colton, California has sent me 3-4 pod flowers a year for study. Of these only a few were pollinated by a foreign pollinium. The majority had developed by parthenogenesis. None of the flowers that were pollinated had pollinia in the anther wing slot. It had been written that this is the way insects pollinate hoya flowers by getting their lags caught with the twisting of the pollinarium and in an effort to remove it, they pull their legs up and the pollinia is pulled into the anther wing slot and thus is in a position for the germinating pollen tubes to reach the stigmatic receptive area. I will assume from these 20 or more pollinations that it is just as likely or more so that the pollinia is dragged off between the anthers and lodges on top or near the retinacula and germinates from that position.

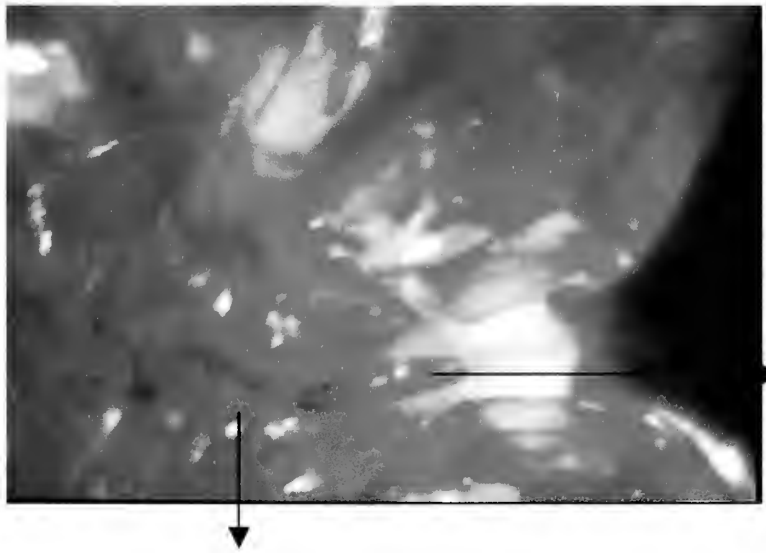
Last year (2003), Erwin sent me about 13 pod flowers. Examining these I found all had been pollinated by pollen not of the attached flower. Only one seemed to be of parthenogeneic origin. All had been pollinated by a pollinarium laying in a linear fashion, one pollinium under the anther and the second pollinium laying over the in place retinaculum and that pollinium had germinated into the receptive area. In many of these samples there were more than one foreign pollinarium on the flower face.



Here is a foreign pollinium laying on top of the anther wing that has sent pollen tubes from the bottom side into the stigma below. The retinaculum is on the in place retinaculum and the 2nd pollinium is facing to the flowers center (left side of picture.



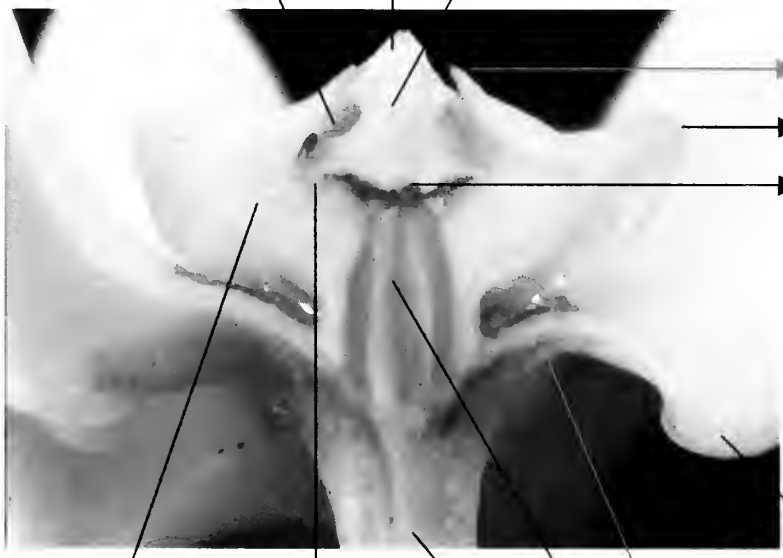
A pod flower with all pollinarium in place and no foreign pollen present either on top or in the anther slots.



One more photo to show the foreign pollen on top of an in place retinaculum in a spread eagle conformation with the 2nd pollinium toward the flower center between the anthers.

A germinated pollinium, to the left the retinacula. (reddish spot)

Pollinarium (two pollinia attached by caudicles and supported by the translators attached to the dark retinaculum.



5 anthers meet at the center top of the flower

This whole central area is the stylar table. It is not the stigma!

Inner lobe of the corona

Outer lobe of the corona

This red area is soft damp spongy cells that lead from the stigma (at the ends both right and left) to the top of the ovaries which contain the ovules, that when pollinated become the seeds.

The corolla (the petals of a hoya)

Rigid anther wing side.

Calyx

Stigmaric surface is directly below The dark retinaculum on the under edge of the stylar table.

Two ovaries, side by side containing ovules.

The pedicel, one for each flower.

Pollination References:

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(12) Pollen Germination of Asclepias exaltata, Effects of Flower Age, Drying Time, and Pollen Source. T. R. Shannon & R. Wyatt. Systematic Botany 11(2): 322-325. 1986.
(13) Experimental Evidence Concerning the Role of the Corpusculum in Asclepias Pollination. R. Wyatt. Systematic Botany 3(3): 313-321. 1978
(14) Comments on pollinia and twining Ceropegia plants from Arabia. Len Newton. Asklepios ?:35-37
(15) In Vitro Pollinium Germination of some Asclepiads. S. Khatoon & S. I. Ali. Asklepios 29-31:8-17
(16) Artificial Hybridization in Duvalia. M. B. Bayer. Asklepios 41-43:25-30

Hoya verticillata (Vahl) G. Don

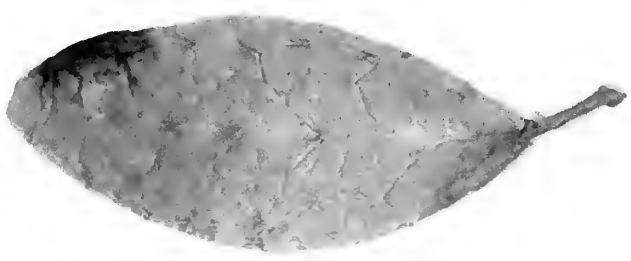
Where do we begin in order to solve a complex puzzle?

by Dale Kloppenburg

In the last issue of Fraterna, page 14, I presented a list of reasons (10) why Vahl's 2 species were not *Hoya parasitica*. These specimens were collected presumably in Eastern India in 1804 and presumably in Tranquehar (East coast of the Deccan Peninsula). In 1995 Dr. Veldkamp. R. v. Donklaar and I published a paper "The Identity of Sperlingia Vahl (Asclepiadaceae)" in Blumea 40:425-428, based on the identity of Vahl's sheets as being *Hoya parasitica (Roxb.) Wall. ex Trail, which I feel was incorrect.

First the early descriptions of *Hoya acuta, Hoya parasitica* (Asclepias parasitica), *Hoya pallida* etc. from 1821 to 1874 (17 descriptions in all) nearly all identify this (or these) species with the following characteristics: leaves ovate-lanceolate, sharply acuminate (or attenuate), sepals linear, corolla glabrous, and corona lobes concave above.

With limited space I shall present a few photos and data that show some major differences between these species (*H. verticillata and H. parasitica*).



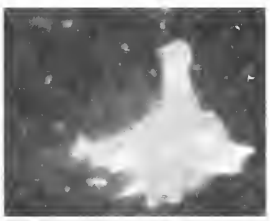
Scanned leaf actual size from **Sperlingia verticillata** Vahl. Note the reticulate venation, a long petiole with a groove on upper side. Apex of leaf here missing, (others short, tapered, acute). This leaf measures 7.5 cm. and in the middle 3.1 cm. wide with a slight edge roll under. Petiole is 1.5 cm. long; grooved on the upper side where there is a leaf gland at the attachment on the upper side. *Hoya parasitica* has leaves 7.5-17 x 3.5 - 7.5 cm.

Photomicrographs from a Type flower and data follow:

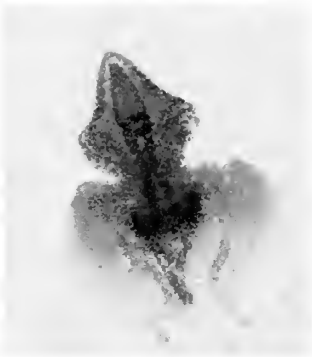
Photo of the dried flower enlarged about 8X. Pedicel: terete, filiform 1.65 cm. long and 0.04 cm. in diameter, glabrous, yellow, curved. **Corolla upper surface densely pubescent.** Coronal lobes exceed the corolla sinuses. Note the distinct keeled dorsal surface of the coronal scales.

Bottom view of the same flower enlarged about 8X. Calyx is small broadly triangular with a rounded apex and a few cilia. Acute coronal lobes project beyond the coronal sinus. Corolla underside is glabrous but granulose. Note the **conduplicate** (ears) on the coronal sinus area. Sepals do not reach the corolla sinuses.

Outside surface of the calyx and pedicel enlarged about 8X. Sepals membranous, overlap is about 1/3, **base broad apex rounded**; do not come near the corolla sinuses. Calyx outside glabrous but punctate. Inside glabrous, waxy appearing. Center – apex 0.14 cm.



Stylar crown enlarged about 32X. The crown is raised, narrow and with a small mealy capitate head, from a rather thin pentamerous base.

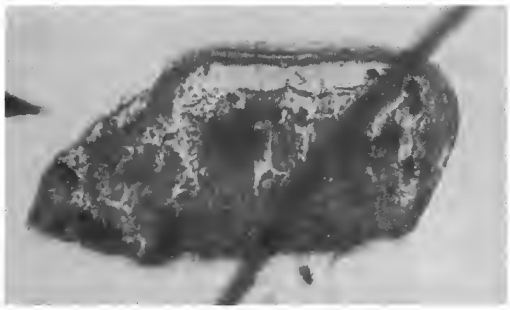


Retinaculum enlarged about 165X.

length	0.18 mm.
shoulder	0.10 mm.
waist	0.05 mm.
hips	0.06 mm.
extensions	0.05 mm. or maybe none.

Translators

length	0.05 mm.
depth	0.04 mm.



Pollinia enlarged about 165X. Remember this is from a plant probably mounted in 1804, so it is nearly 200 years old. Here it is a bit distorted but we can see there is a rather wide vacuole in from the pellucid edge and the pollinia is rather wide for its length.

length 0.39 cm.
widest 0.18 cm.

I suppose the pollinia actually may measure slightly longer. All the measurements here are smaller than any of the *Hoya acuta* Haw. group, that I have grown or collected.

Next is Sheet of *Sperlingia verticillata* Vahl, #72 II. 6-2. Annotated by R. v. Donkelaar March 1996 as *Hoya parasitica* (Roxb.) Wall. ex Trail. Note 4 leaves from closely packed nodes (2). Vahl toyed with the name "tetraphylla" then chose "verticillata", meaning whorled.

- In the next issue of Fraterna I will discuss the name priority of the *H. parasitica* complex.

Photo Gallery Descriptions

Top row left: This is a photo of *Hoya rigida* Kerr. This species is from Thailand and was described in 1939. The leaves are ovate-elliptic with rounded bases and acute apices. 4-6" long and 2- 2/12" wide. There are 25 or more waxy flowers in a globose cluster. Flowers are usually creamy-white but clusters opening in cool weather, such as in the early spring may be pale pink in color. This is a strong growing plant and when mature a prolific bloomer. *Hoya pachyclada* Kerr is another species from the same general area discovered by Kerr. Both of these species need decidedly less water in the winter months. They go through a rest period in their native lands and thus utilize less moisture, depending somewhat on their fleshy, succulent foliage. The local native name is "Tao roi pla". Picture taken in 2004 at Fresno, California.

Top row right: *Hoya carnosa 'Krinkle 8'*. One of the more decorative cultivars that has appeared in recent years, and among the very best! The foliage is thick and quite succulent, dark, glossy green with indentations on each side of the mid-vein. The medium sized carnosa type flowers are either pure white with a red center or can be various shades of pink. The growth pattern of this plant makes it a winner. The close leaved branches grow rapidly, into long, cascading waterfalls of deep green. There is also a gorgeous, variegated from of this plant. Photo by Chuck Everson.

Second row left side: A photo of *Hoya betchei* (Schlechter) Whistler a Samoan species. This species was placed in the genus Physostelma by Dr. Schlechter in 1908. Later Dr. Whistler named it as a Hoya. As with the above species it is a graceful slender branched loosely leaved species. The corolla is cupped with a soft pubescence on the inside. Although this and the above species have been combined (made synonymous) this is certainly incorrect. This is a high altitude species. The clusters are of few flowers usually of a cream color. I am hoping we can find this among the material I collected in Samoa in the fall of 2003.

Second row right side: Another Samoan hoya species with plenty of uncertainty in its identification. *Hoya filiformis* Rechinger 1908, a peninerved leaf species (nerves like a feather). Dr. Art Whistler took the pictures of all 3 of these hoya species in Samoa. Although the picture is identified as this species and is certainly different from the others, it does not fit the type description. The type was describes it as a thin stemmed plant, the total plant glabrous, leaves opposite, thin and peninerved, lanceolate-ovate, acuminate. Peduncles are only 0.7- 0.8 cm. long, with pedicels the same length. (very short). Flowers are small white less than 0.9 cm. in diameter. The whole cluster is said to be only 2 cm. in diameter (less than one inch). Again Rechinger in his final sentence in describing this species says the entire plant is completely glabrous. So look for a plant with glabrous white small flower clusters. I do not think my picture actually fits this species. Good luck in your search. There is plenty of exciting things yet to learn about the genus Hoya.

Hoya Photo Gallery


Hoya rigida Kerr

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