

STEMMA



a pdf magazine devoted to Hoya
culture, history, and photography

Editor: Mark Randal

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Welcome!

Welcome to the first volume and issue of Stemma, an electronic magazine dedicated to the cultivation and study of the genus *Hoya*. Stemma will feature serial and one-off articles exploring all aspects of the hobby, from cultivation techniques and photography to taxonomy and history. Stemma will not attempt to publish species, endorse taxonomic positions, nor make definitive statements of any sort. It is hoped, rather, to be a forum for amateur growers to better understand cultivation practices and basic relationships between plants of this genus, and to share their experiences with other growers.

The first issue is written primarily by the editor. Hopefully future editions will bring articles and photography from other collectors, professional growers, and taxonomists. Stemma does not as a matter of policy accept advertising, but contributors may have a short bio with business names and addresses posted with their contribution.

Two recurrent features of Stemma will be a photo contest (see the **Photo Contest** entry below) and an **Electronic Letters** department, where your comments, questions, or criticisms of Stemma will be addressed.

There will be an ongoing series of articles on horticultural principles, beginning with very basic subjects and advancing in complexity over time, and two features involving specific Hoyas or groups of related species; **In Cultivation** will focus on the cultural aspects of a featured plant, and **History** will attempt to trace the collection, introduction, publication, and distribution of a particular plant or complex.

A **Source Material** entry will appear at the end of each Stemma, with references for each article. Also, a **Glossary** will appear at the end of the magazine. Terms defined in the glossary will be followed by a pink asterisk in their first appearance in the text.

Please enjoy, and e-mail your comments, corrections, or photo entries to the editor at: markroy68@yahoo.com.

In Cultivation:

Hoya waymaniae D. Kloppenburg

by Mark Randal

Hoya waymaniae is a striking plant from Borneo which was published by Dale Kloppenburg in Fraterna, 1995, #2. It was named after Ann Wayman, editor of Fraterna and long time Hoya grower. This plant is one of the more distinctive Hoyas in cultivation, so it is fitting that it would be named after Ann. This species was first collected in the late 80's by Arden Dearden in Sarawak, and has since been collected from many other locales in Borneo by Ted Green , David Liddle, and Torill Nyhuus.



figure 1: The partially opened flowers of *H. waymaniae*. 3



figure 2: leaves of H. waymaniae

Hoya waymaniae was placed by Dale Kloppenburg tentatively into Section* **Acanthostemma** Blume, Subsection* **Angusticarinatae** Kloppenburg, which corresponds to section **Pseudohoya** C.M. Burton in her alternate arrangement of Hoya sections. He did note that the coronal* structure differs in certain details from other plants of this subsection, so its placement here may change in the future. Among its subsection-mates are H. diptera, Seem., H. bella Hook., and H. anulata Schltr. While at first glance these Hoyas look very different, there are some superficial similarities in appearance, among them the rather hard, non-succulent leaves and the arrangement of flowers on a slightly concave plane. There has been mention of a yellow flowering variant of

H. waymaniae, and a plant called Hoya cv. 'Orange Peel', either of which may be a hybrid or one of the many clones* of this species found in cultivation.

In its native habitat in Borneo, it has been collected in rather densely shaded forests, growing in the loose leaf litter of the forest floor and climbing up into low growing bushes, which it accomplishes by means of adventitious* roots from along its stem rather than by twining. It has been speculated that the very long peduncles* are an adaption to display the flowers above the leaf debris in its native home, and at least one plant has been found creeping along in the leaf litter with its peduncles growing straight up into brighter light. Other reports state that H. waymaniae usually begins flowering after having climbed into low branches of nearby shrubs, onto rotting logs, or across stone outcrops and hence into brighter light. Torril Nyhuus reports that on her 1997 collecting trip to Borneo she found it growing from sea-level to 500M.



figure 3: side view of fully opened flowers. The corona segments here look very much like horses teeth.

This Hoya has a reputation for being fussy in cultivation and has been known to suddenly rot and die for no apparent reason. However, if this plant is thoughtfully potted and close attention is paid to watering, it can become quite vigorous and produce long, initially leafless stems which will soon fill in with dark green oval leaves blotched with silver and red. The leaves, which may reach 15cm in length on some clones, have a wavy margin and a rather hard, cardboard-like texture. It will

eventually produce very long peduncles (up to 20cm long peduncles have been recorded) and the glorious pumpkin-orange flowers pictured here.

The flowers open from pale orange and burgundy buds approximately 1/2cm. across and over the span of several hours all of the flowers will open into almost perfect orange spheres , about 3/4cm. across, with the burgundy coronas hanging beneath. The clusters are composed of approximately 15- 20 flowers, which have a faint camphor scent and last for about 5 days. The peduncle will occasionally drop after flowering.

H. waymaniae is reported to bloom twice a year when it is very happy in its environment.

Even when not in bloom this plant is very attractive, with sinuous thick stems that cascade gracefully and tend not to twine on themselves, making this a relatively care-free hanging basket subject. The leaves can take on a rather garish red coloration in very high levels of light and are much more attractive when given no direct sun except perhaps for an hour or so in the early morning or late afternoon, with bright indirect light the rest of the day.

David Liddle reports that H. waymaniae grows well in trays in his nursery in Queensland, Australia , due to its rather shallow root system, and begins flowering when it has climbed over the edge and begun dangling. The plant whose flowers are pictured here (owned by the editor) was over-potted in a shallow, 6" pot (from a not particularly root-bound 4" pot) on its arrival from the dealers, in November '05 and has grown vigorously and constantly over the last year, flowering in January '07.



figure 4: close-up of fully opened flowers.

H. waymaniae prefers warmer temperatures-generally over 60' F (15' C) - and benefits, as do most Hoyas, from good air movement. A well draining, fairly loose mix suits this plant. Given its shallow root system an azalea or "squat" pot would seem to be in order. There have been many, sometimes contrary, claims about the appropriate watering regimen for this species. It seems to respond well to drying very slightly between waterings, much like H. carnosae, but certainly resents drying out completely, as the leaves will desiccate quickly in response to water stress. High humidity, such as is found in its native forest home, also seems to be an important factor for growing this species. Specimens grown in low humidity seem to be more prone to sunburn and desiccation.

Horticulture 101:

Elements of Fertilizer

by Mark Randal

One of the most important aspects of the cultivation of any plant is proper fertilization. Attention must be paid to the nutritional needs of the subject, as plants vary in their needs from genus to genus and to a lesser extent, from species to species. Some plants, such as most edible citrus varieties, are heavy feeders and need large amounts of nutrients to perform and bear well. Other plants, such as cacti and most succulents, require very little in the way of nutrients and if over-fed will etiolate* and produce very unattractive, spindly growth that often is too weak to support itself properly. Hoyas require less nutrients than many ornamental plants to perform well, but respond to adequate feeding by growing more vigorously and flowering more abundantly.

Let's begin by taking a look at the components of a well balanced fertilizer. There are 17 basic elements required by most plants for basic functions of growth and reproduction. Three- carbon, hydrogen, and oxygen, are supplied by the air and water in a plants environment. The other 14 elements are normally provided by the plants growing medium- soil, or in the case of epiphytic plants, by water coursing down bark laden with organic debris. These elements are divided into three basic groups- primary nutrients, secondary nutrients, and micronutrients.

Primary nutrients are the three major nutrients required by plants in large quantities (parts per hundred), and consist of nitrogen, phosphorous, and potassium. These three elements compose the familiar three-part label on all commercial fertilizers and are commonly referred to as N-P-K (K being the chemical symbol for potassium). Next

are the secondary nutrients, which are also required in parts per hundred. These are separated from the primary nutrients because these three elements are found in sufficient quantities in most soils. These are calcium, magnesium, and sulfur. Last are the micronutrients. These elements are required in much smaller quantities, parts per million or billion. These elements are boron, chlorine, copper, iron, manganese, molybdenum, nickel, and zinc.

All of these elements are required for proper growth and reproduction in plants. If a plant is deficient in any one of these chemicals it will display signs of the deficiency. Unfortunately, many of these symptoms appear very similar, and certain deficiencies or excesses can cause plants to become deficient in other elements by interfering with the plants ability to process them. For instance, interveinal chlorosis (yellowing between a leaf's veins, which remain green) is a symptom of deficiency in phosphorous, magnesium, iron, manganese and zinc. A deficiency in phosphorous can lead to a plant becoming deficient in zinc and iron, and a nickel deficiency can lead to a plant becoming deficient in iron and zinc, even when those elements are present.

Some on-line sites provide photos of typical deficiency symptoms, which may be of use, but diagnosis of particular deficiencies is quite difficult by sight alone. The best way to avoid nutrient problems is to use a well balanced fertilizer with complete micronutrients. As Hoyas are generally light feeders, 1/4 to 1/2 strength of the specified concentration is usually sufficient. For stronger concentrations (1/2 to full strength) plants must be watered first with plain water to avoid the chance of burning roots with the fertilizer, a chance that is increased when a plant's soil is very dry and the plants are water-stressed. At 1/4 strength fertilizer solution may be used to water most plants without soaking in plain water first.

Hoyas are not generally fussy, but some species are known to be more sensitive than others to deficiencies or excesses. Most notable is Hoya

subcalva which seems to be quite sensitive to nutrient levels, a trait which it has passed on to its progeny (a group of *H. subcalva* x *H. australis* hybrids, and possibly *H. naumanii*). Typical signs of nutrient problems in Hoyas are distorted leaf margins, small leaf size, rosetting (short internodes* forming a "rosette" of leaves), discolorations or chlorosis in new leaves (including garish yellows, pinks, or purples), stunted growth, and leaf burning. Attention to the exact symptoms may help in diagnosis.

Hoyas seem to be particularly susceptible to phosphorous poisoning. Bloom formulas, like the awful 0-60-0, are one of the worst things you can give to your Hoyas. Even when blooming, plants need nitrogen and other nutrients to carry out vital functions. Further, high levels of phosphorous will not encourage a plant to bloom when it is not inclined to do so. Adequate levels of phosphorous are required for proper formation of buds and for flowering, but the smaller amount available in a balanced formula is entirely sufficient. Overdoses of some nutrients, like phosphorous, can remain in the plant tissues for long periods, causing damage long after the offending fertilizer is used.

In future issues of Stemma specific fertilizers will be evaluated for use on Hoyas.

History:

Hoya lanceolata Wall ex. Don and its ssp, bella Hook.

by Mark Randal

It should be noted that the identities of these two plants have been often confused, and H. lanceolata* in particular has been elusive at best in cultivation. The plant accepted as H. lanceolata in cultivation generally has shorter, more triangular leaves than the plant we know as H. bella,* and the corona segments of our H. lanceolata are narrowly terete (rolled nearly into a tube) while those of H. bella are cymbiform (boat shaped). H. bella has a scent that has been compared variously to the scent typical of H. carnososa and also as "sickeningly sweet" or cloying, whereas the scent of H. lanceolata has been said to be reminiscent of lilly of the valley (Convallaria Majalis L.), though more diffuse.

Although the current technical names are Hoya lanceolata Wall. ex Don and Hoya lanceolata Wall. ex Don ssp. bella, Hook., since most of this article deals with the historical understanding of these plants as distinct species, they will be presented here as such.

The first of these two to be published was H. lanceolata. It was published by Nathaniel Wallich, who was the superintendent of the East India Company Botanical Garden at Calcutta from 1817 to 1846. The publication was based on two herbarium sheets- Wallich 8164A from "Nepalia" (Nepal) and Wallich 8164B from Sylhet. Wallich collected from the region himself, and the Botanical Garden was a regular stop for the many plant collectors working in the Himalayan region. Hoya lanceolata was later more fully described by David Don in Prodromus Florae Nepalensis (1825), based on a named herbarium specimen of Wallich's, 8164A.

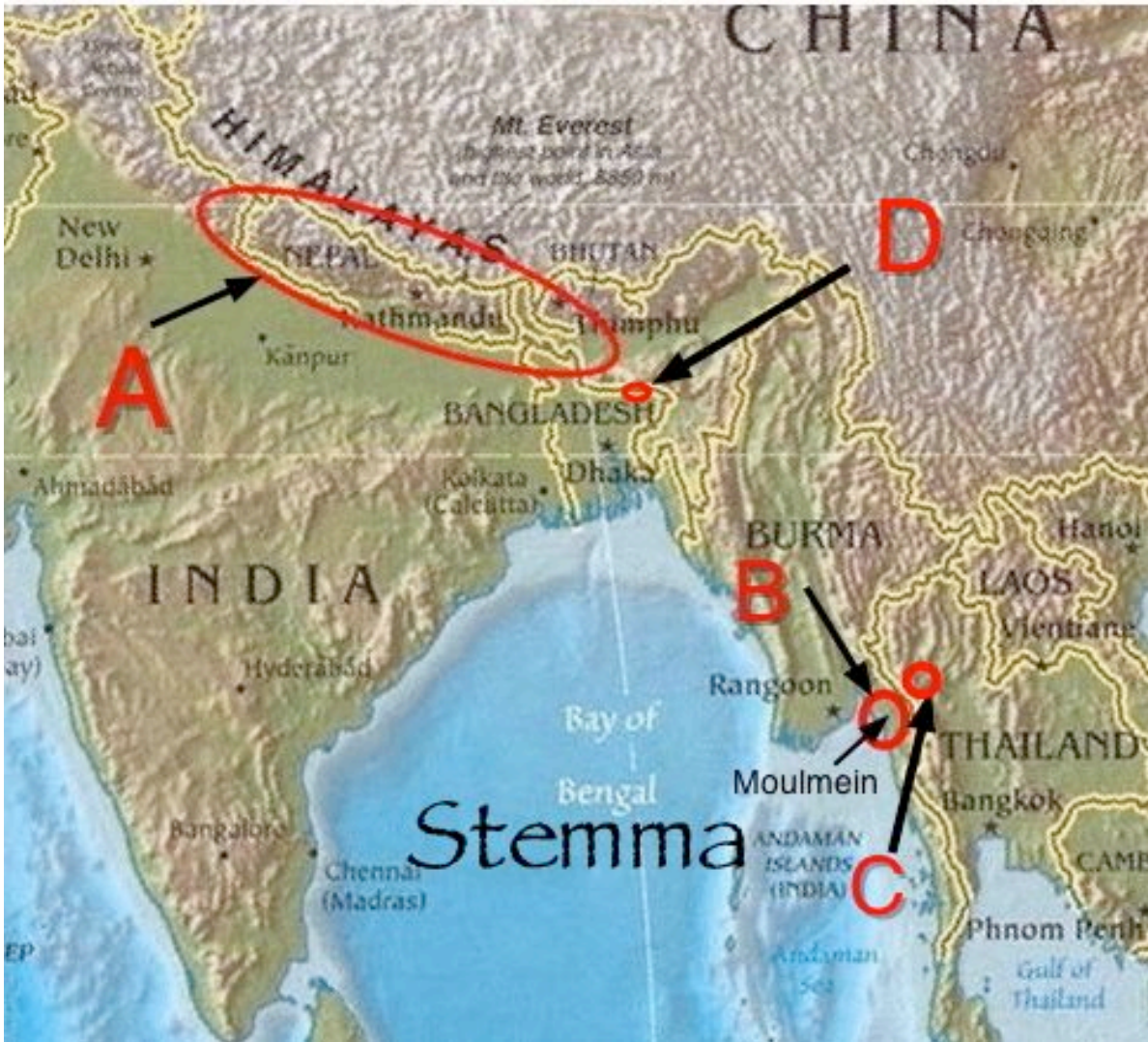


figure 5: this map represents the distribution of (A)- *H. lanceolata* and (B)- *H. bella* according to early descriptions, and confirmed by Douglas Kent in 1981. Also indicated are the collections sites of (C)- *H. weebella* and (D)- Wallich 8164B, which is said by David Liddle to be a match with the plant introduced as "*H. paxtonii*". Actual distribution areas may be somewhat larger.

Hoya Bella was collected first by Thomas Lobb, reputedly in the Tuang Kolo mountains of Moulmein, Myanmar (previously Burma) while on a collecting trip for the nursery Veitch & Sons of Exeter, England. *Hoya Bella* was published in *Curtis' Botanical Magazine* (1849) by Sir William Hooker, who was at the time Director of the Royal Botanic Garden, Kew. The text was accompanied by a botanical illustration 12



figure 6: the original illustration of *H. bella*, Tab 4402, published along with the type description in Curtis' Botanical Magazine in 1849.

(tab 4402) which is widely used as *H. bella*'s type sheet.

In the years after the introduction of *H. bella*, the plant was rather popular and sought after in England. It was discussed many times in The Cottage Gardener, a horticultural journal of the times. Some articles published there dealing with *Hoya bella* advocated growing the plant as a graft upon *H. imperialis* Lindl. or another strongly growing *Hoya*, and one author reported seeing a plant grown very successfully with this method.

In 1852, a plant called "*Hoya paxtonii*" was presented at the Royal Botanical Society's Horticultural Exhibition in London. This plant was reputed to be similar to *Hoya bella* Hook, differing in having longer, lighter green leaves and with the corona color tending more towards cerise than the amethyst of *Hoya bella*. This plant is still in cultivation today, and is said by many to be a superior performer to *H. bella*. 13

A plant sold as "Hoya sikkimensis" has circulated in the United States at least since the 1970's. No publication of this name seems to have been attempted. The plant was said to agree closely with the description of H. lanceolata (Kent, 1980).

In his 1980 paper Notes on Hoya in cultivation (1), Douglas Kent explored the relationship of these four groups of plants, and presented a new combination of names : Hoya lanceolata Walliuch ex. Don as a species, with H. bella Hook. reduced to a subspecies of H. lanceolata. He determined that the plant known as Hoya paxtonii was a form of H. lanceolata ssp. bella and the plant known as H. sikkimensis was a form of H. lanceolata.

Douglas Kent apparently reconsidered this arrangement later in life, and decided that H. bella Hook. and H. lanceolata wall. ex. Don should indeed stand as two distinct species, though he died before he could elaborate upon this consideration. H. lanceolata and H. lanceolata ssp. bella generally are regarded by most modern growers and taxonomists as being distinct species, though this position has not been officially published. The plant initially known as H. paxtonii, represented by herbarium sheet Wallich 8164B also is being looked at closely, as it may be a distinct species. More work would seem to be needed upon this taxon* in the future, as the current standing seems to be untenable* to most taxonomists.

In 1992 a new plant collection was introduced into the United States, via Christine Burton and Dale Kloppenburg from cuttings sent from Thailand by Chanin Thorut. This plant was said by Thorut to have been collected in Tak province in Thailand, near the border of Myanmar and very near Moulmein, the original collection site of H. bella. This new collection was similar to Hoya bella Hook. but generally smaller in all aspects of leaf and flower. Three clones were said by Burton to have been represented in this collection, one usually having 3 leaves to each node rather than two. This clone was pictured on the cover of The Hoyan (vol. 15, #2), and was called by C. Burton "wee bella" as a matter

of convenience in distinguishing it from other clones of *H. bella*. It was considered as possibly being *Hoya vaccinioides* Hook.f., but was said by Douglas Kent and Dale Kloppenburg to not be that species. Through the following decade some of these three clones have been distributed variously as *Hoya vaccinioides* Hook.f., *Hoya vacciniflora* Schwartz, *Hoya bella* var. *wee bella*, and probably under others names.

There were several species publications; *Hoya dickasoniana* P. T. Li (1994), *Hoya kingdonwardii* P. T. Li. (1994), and *Hoya chinghungensis* (Tsiang & P. T. Li) M.G. Gilbert, P.T. Li & W.D.Stevens (1995) that were based on four herbarium sheets that C. M. Burton found at the Arnold Arboretum Collection, Harvard and reproduced in *The Hoya* V.3 along with the introduction of "wee bella", noting that they were "herbarium specimens of this small *Hoya*". One plant sent from Thailand by Chanin Thorut to Dale Kloppenburg was published as *Hoya weebella* D. Kloppenburg (2005). This plant has very small leaves, usually born three at each node, flowers that measure about 1.2cm. in diameter, and matches well with the plant called "wee bella" by Burton. C. M. Burton considers two of the clones published by Li and the clone published by Kloppenburg to be forms of *H. bella* with smaller leaves and flowers, and considers that the remaining clone (published by Li) is possibly also a clone of *H. bella*, so these names are still the subject of some debate, which seems to be the usual state of affairs in our evolving understanding of this complex genus.

Chemicals:

Imidacloprid and the Two-Spotted Spider Mite

by Mark Randal

A 2002 paper, Imidacloprid Boosts TSSM Egg Production, David G. James & Tanya S. Price, which can be found on the web at www.aenews.wsu.edu (issue #189), has indicated that the chemical Imidacloprid, a systemic* insecticide widely used in agriculture and ornamental horticulture, has shown an unfortunate side effect- the dramatic increase in egg production by two-spotted spider mites subjected to a non-lethal dose of imidacloprid. Egg production is said to be increased by 20- 50% in Two Spotted Spider Mite (TSSM), but other spider mite species were not covered in the study. TSSM is the most common mite pest in horticulture.

This chemical is found in Bayer Advance Tree and Shrub Systemic (or BATSS), as well as Admire, Condifor, Gaucho, Premier, Premise, Provado, and Marathon. These systemic insecticides are used by some Hoya growers to counter mealybugs, aphids, and scale. BATSS, the formula most often used by small scale growers, has been a boon for Hoya cultivation, as Hoyas are notoriously prone to mealybugs. Growers using any of these products will need to keep a sharp eye out for booming spider-mite populations, indicated by minute webbing along the midribs of the lower sides of leaves, and by tiny red, black, or brown specks adhering to leaves undersides.

Most Hoyas are generally unbothered by spider-mites. The Hoyas most often affected are thin leaved plants such as *H. bella*, *H. odorata*, *H. X 'Iris Marie'*, *H. linearis*, and sp. Tanna Island 1. All Hoyas may be vulnerable, however, especially when stressed by improper watering or light conditions.

Living With Hoyas: Hoya ciliata

text and photography by **Carol Noel**



figure 7: unopened seed pods on *H. ciliata*.

Well, there I was - walking along the road where I had planted a bunch of *Eriostemmas** to grow up trees (fly...be free. I am fortunate to live in an area where *Eriostemmas* flourish...and can almost be considered weeds). I am usually looking down (weeds to pull, what bromeliads are blooming, what plants needs dividing, signs of bug damage?) or

at eye level (what to prune, what should I air layer, signs of bug damage?)...For some reason I looked up about 15' to where a H. ciliata was growing and saw three green bananas. Huh? SEED PODS! I was thrilled! My only other hoyas to produce pods, so far, have been H. australis ssp. australis (follicles like a French bean) and, in the shade house, H. lacunosa from Lankawi Island (very small follicles but dozens of them).

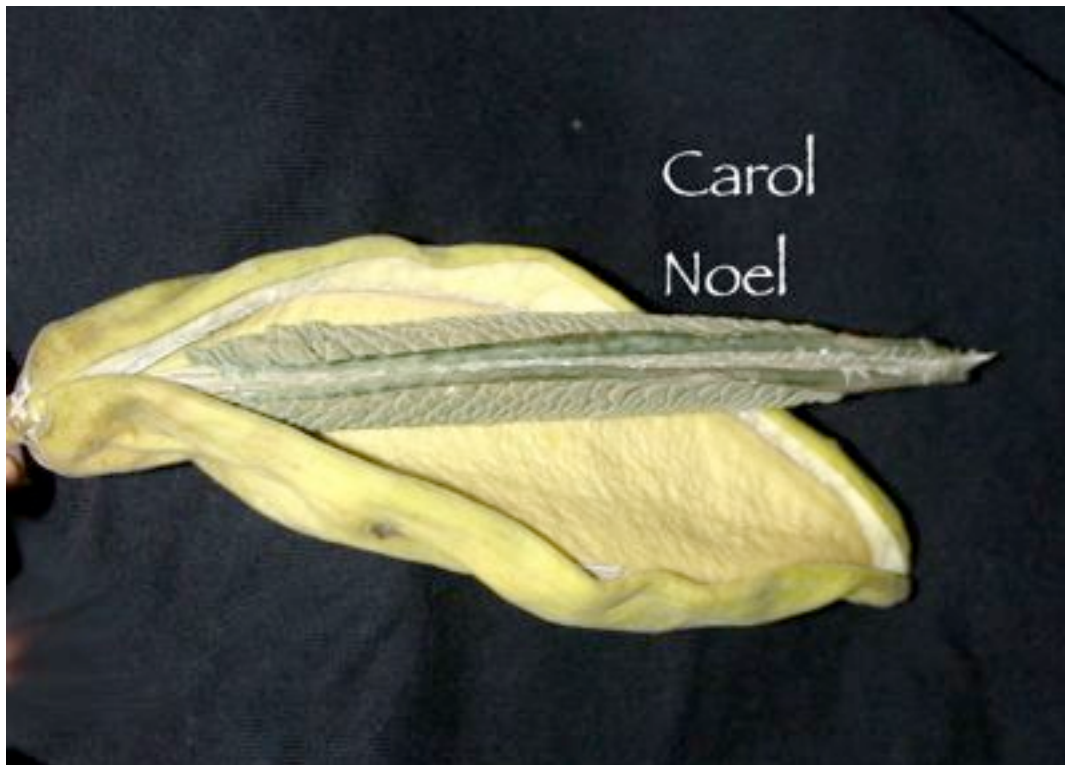


figure 8: Dried seed pod with seed sheath fully visible.

Diligently I monitored the progress of the pods. When the first one dried and exposed the seed sheath we were walking by in the rain. I cut down the pod and carefully put it on the heat-mat in the greenhouse, snuggled in a knee-high panty hose (I use strips of these to tie plants to trees). We waited for the 'ripe' moment.



figure 9: Close-up of seed sheath, with brown seeds connected to compressed white floss.

Rolling back the stocking, the seeds exploded in silent energy...like a quiet volcano...it was so magical and there was no way I could capture this energy except to coax the seeds onto a tray of medium, and to dampen them with warm water and wait. I didn't have to wait long to wait-2 days later they popped- and they are still growing. In a few weeks I will select the 30 strongest of the lot to grow out even further. Then, later, cull them down to perhaps 20. I suspect they are self-pollinated, although Hoya 'Ruthie' grows on the tree just next door.

I have lots of trees!



figure 10: floating seeds attached to expanded floss.

Carol Noel operates [Aloha Hoyas](#) and [Aloha Ti and Tropicals](#), on the web at www.bigislandgrowers.com.

Photo Contest:

As this is the first issue of Stemma, no winning photo has been selected. Please send in your photographs for consideration in future issues to: markroy68@yahoo.com. Photos will be selected for skill in photography and overall effect- no points are awarded for rarity of bloom or difficulty of cultivation, so a photo of the common Hoya carnosa is as apt to win as one of the elusive H. megalantha. Watermarking your photos is always recommended, but for contributions to Stemma please locate the watermark to one side and not directly over the photographs subject. Due to Stemma's PDF format, photos are more difficult to steal and quality is much reduced, so theft is less likely than on straight internet postings. If you can't watermark photos yourself, Stemma will gladly do so for you. 20

Source Material

for **In Cultivation**: Hoya Waymaniae- Passport Hoya series. Dale Kloppenburg, 2001

for **History**: Hoya Bella Hook and Hoya Lanceolata Wall. ex. Don.-Passport Hoya Series, Dale Kloppenburg, 2001; The Hoyan V.3 pgs. 7-12, 1981 & V.15 pgs 29-32, 1993; Prodromus Florae Nepalensis, 1825; Curtis' Botanical Magazine, 1849; Notes on Hoya in Cultivation (1), Douglas Kent, 1980; Wikipedia for biographies of Nataniel Wallich, Thomas Lobb, and David Don; P.S. The Hoyan V.4 #3

for **Horticulture 101**: Elements of Fertilizer- California Master Gardener Handbook, Dennis R. Pittenger, 2002

for **Chemicals**: Imidiclopid and the Two-Spotted Spider Mite- Imidaclopid Boosts TSSM Egg Production, David J. James & Tanya S. Price, 2002,

aenews.wsu.edu

Glossary:

adventitious- developing from unusual points of origin.

bella- "beautiful" - Latin.

clone- a distinct genetic individual, identical to plants propagated from the same source.

coronal- of the corona, the central portion of a Hoya flower consisting of the sexual organs.

eristemma- a largely tropical section of the genus Hoya (considered by some to be a distinct genus) comprised of plants with large (up to 3") flowers.

etioliate- to become spindly, elongated, weak.

internode- the portion of stem between two leaf nodes.

lanceolata- "lance-shaped" - Latin.

peduncle- the (usually) permanent structure from which Hoya flowers are borne.

section- a division of a genus comprised (ideally) of closely related plants.

subsection- a division of a section within a genus, distinct from excluded section members.

systemic- The action of absorption by an organism, which distributes a substance throughout the organism.

taxon- a group of related plants in discussion.

untenable- taxonomic term used to describe a legitimately published but erroneous point.