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contents

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Editor's Note

This issue contains an article from our Editor of *Dischidia* content, Antone Jones, exploring the phenomenon of "pocket" leaves in *Dischidia*. Antone maintains a website devoted to the genus *Dischidia* at: www.dischidia.com.

The second installment of the article "A look at *Hoya* sections" appears in this issue. The first installment explored two major groups of *Hoya* species, one containing complexes like *Otostemma* and *Acanthostemma*, which have small, ball-shaped flowers formed in flat clusters, and the other group containing complexes like the *Hoya pottsii* complex and section *Hoya*, which have mostly medium-sized flowers with flat or reflexed flowers in rounded clusters. This issue picks up with one more section which might be closest to section *Hoya*, and then focuses on four species complexes/sections which seem to form a third major group of species complexes epicentered in Australia and New Guinea.

Stemma now has a website: www.stemmajournal.com , where current and past issues can be downloaded. The website also features pages which list vendors, websites & forums and on-line literature sources from around the world.

Also on the ***Stemma*** site is a growing photo gallery in which we are attempting to show images of the flowers and leaves of every *Hoya* in cultivation. This may take some time, but we are off to a good start.

Here are a few images from the ***Stemma*** photo gallery:

Pockets: Not Only For Jeans

By Antone Jones

Dischidia vidallii

Man was not the first on Earth to make use of the pocket. Sorry Levi, but Mother Nature beat you to it! As many know, the genus *Dischidia* contains species with various foliage types. There are those with normal foliage, those with shell leaved foliage and there are those that grow both normal and bullate foliage. In this article we will take a look into the bullate (or pocket) leaved types. What are these structures? What are their functions?

This group of plants in *Dischidia* currently contains only three species: *Dischidia major* (Vahl) Merr., *Dischidia vidallii* Becc. and *Dischidia complex* Griff. All three species produce pocket leaves but each of them is different and unique on its own. Not only are the pockets different but the normal foliage and flowers differ greatly as well. They do, however, share some characteristics.

Dischidia major, *D. vidallii* and *D. complex* are all myrmecophilous in nature. This means that they exist in harmony with ants, forming a symbiotic relationship with them. In the wild, ants seek refuge inside the pocket leaves that these plants produce. Soil, larvae and deceased ants have all been found inside of these structures. The benefit to the ants is clear in that these structures provide a nesting site. The plants also benefit from such a relationship as their roots grow inside of the pocket leaves and can thus obtain nutrient from the ant excrement and detritus. Perhaps the ants could also provide some degree of protection to the plant from would-be predators.

Basically, the pockets are formed when the outer margins of a leaf stop growing while the center of the leaf continues to grow. As time progresses the leaf margins curl under to close the gap which creates a small hole. At the point where the petiole meets the pocket leaf, a single root (in *D. major* and *D. vidallii*) or two roots (in *D. complex*) enter the cavity. Once inside they branch and form a complete root system. There have been accounts of large quantities of soil found inside the pocket leaves of *D. major* suggesting that not only can these bullate leaves serve as ant homes but also as a sort of built-in flower pot. It has also been suggested that when the pocket leaves of *D. major* grow hanging upside down, they can trap water which would also serve as a way for the plant to retain moisture in extreme cases of drought. It is not known what exactly triggers the production of the bullate foliage as some specimens contain many pocket leaves while others contain very few or none at all. While these are characteristics that are shared between these three species, they do have a few *major* differences as well.

Dischidia major (Vahl) Merr. (syn. *D. rafflesiana Wall.*) is a widespread and common species. It occurs from NE India all the way to Australia. In nature, it is often a xeric species, found growing exposed to the full sun. *D. major* is also quite variable. There are clones which have "normal" pocket leaves that may average approximately 8cm long by 3cm wide. This "normal" clone is the most commonly seen in cultivation and in some places it is called the "Pickle Vine".

Dischidia major

There are also other clones with very narrow pocket leaves (IPPS 35- pictured to the left), others with small egg shaped leaves (sometimes called *D. lutescens)* and even clones with seemingly gargantuan pocket leaves that are nearly the size of a potato. *D. major* possesses the most simple pocket leaves of the three species. Its pockets are simply hollow with no other structures inside them save for the roots. The laminate foliage is nearly perfectly circular and flat with a slight curvature of the abaxial surface creating an almost concave area similar to that of the shell leaved species. The flowers are usually green with darker green stripes but can also be yellow to yellow-green. The adaxial surface of the corolla lobes is puberulous. They have no smell.

Egg Pocket Clone

2 clones comparison

Pocket of *D. major* cut open.

Young pocket leaf forming.

D. major flowers, Selby clone.

Flowers from a Philippine clone of *D. major.*

Dischidia vidallii Becc. (syn. *D. pectenoides*) is a very common species found throughout the Philippine archipelago. Its pocket leaves are often kidney shaped and appear "wrinkly". This species is the most common in cultivation and is often sold growing from large snail shells. The pockets of *D. vidallii* sometimes contain a much smaller and reduced second pocket inside of the larger pocket leaf. The laminate foliage of this species is small, somewhat elliptic and often has some curvature. The flowers are extremely vibrant and pink. The corollas barely open at anthesis and as such are self fertile. The follicles are typical of *Dischidia* and are needle-like in shape. (Pocket cut open and flowers pictured below.)

Dischidia complex Griff. is a very rare species that occurs in Malaya, Borneo and the Philippines. Its bullate foliage can be round or conical in shape. This species' pocket leaves contain a smaller pocket inside. The laminate foliage of *D. complex* is similar to that of *D. major*. On average they are smaller than *D. major* however. The flowers are yellow with white corolla lobes which are widely divergent. The gynostegium is quite conspicuous at anthesis. (Flowers pictured).

Pocket of *D. complex* cut open to show 2nd internal pocket

Top: Pocket leaf of *D. complex.* Bottom: Normal leaf of *D. complex.*

The function of the internal pockets in *D. vidallii* and *D. complex* is not quite fully understood. There have been suggestions that due to the design of the double pocketed leaves, the inner smaller pocket could provide refuge to ants if the outer pocket were to get flooded. *D. vidallii* has been shown to contain small bits of sweet material on the inner wall of the internal pocket leaf which are a result of decomposition. The ants that inhabit the plant would inevitably consume such material and therefore it is suggested that the smaller inner pocket could also serve as a feeding area. More study of these species in situ is needed and until such studies are conducted, we are left only to speculate.

Cultivating these species can be an enjoyable experience. Being that they are, for the most part, xeric and are strictly epiphytes, we should make sure that they have lots of light and get a chance to dry quite well after being watered. They can be grown mounted or in baskets with extremely well draining mixes. *Dischidia vidallii* and *D. major* are both quite aggressive and can cover a trellis in short time. Personally, I have noted that these three species tend to produce the pocket leaves when allowed to climb and when stressed a bit. Those plants which can not climb and are fed well tend to only grow the typical foliage. *D. vidallii* is a consistent bloomer and seems to never cease blooming no matter the time of year. It is often adorned in buds, flowers, follicles and seed all at once on the same specimen. *D. major* and *D. complex* are reluctant bloomers for me. Propagation of these plants is quite easy and is best done with material that does not contain the pockets. Using material with the pockets tends to rot them which only invites fungus.

A genus of plants with more interesting types of foliage would be hard to find. The pockets that these plants produce are a beautiful oddity in the plant kingdom. Not only are they intriguing but they serve a unique purpose and have specific functions that form relationships with creatures of a completely different kingdom. As time goes on, we can only hope to learn more about their intriguing adaptations but for now we can enjoy them as they are.

Works Cited:

Rintz, R. E. 1980. "The peninsular Malayan species of *Dischidia* (*Asclepiadaceae*)". *Blumea* 26: 81 --126

Pearson, H. H. W. 1902. "*Dischidia* with double pitchers". *Journal of the Linnean Society, Botany* 35: 375 -- 390

- Antone Jones

Reprint *Pterostelma albiflorum*

(*Hoya albiflora Zipp. ex Blume*) From ***Rumphia*** 4, 1848

PTEROSTELMA Wight. *Contrib. bot. of Ind*. p. 39. Endl. *Gen. Plant*. p. 596. no 3502. De Caisne in De Cand. *Prodr. Syst. Veg. VIII*. p. 633. Meisn. *Plant. Gen*. p. 270 et *Comment*. p. 177. 82.

Calyx of five-parts. *Corolla* rotate, five parted. Staminal *corona* five-leaved; leaves membranaceous, laterally reflexed, conniving, interior angle produced into an erect and tooth-like point. *Anthers* terminated in a membrane. *Pollinia* approximately erect; retinacula affixed at the back and base. *Stigma* apiculate. *Follicles*...--- *A half shrub*, woody at the base, of Indiae Orientalis and New Guinea, twining, habitat agreeing with that of *Hoya*; leaves opposite, fleshy; many flowered umbels are axillary and interpetiolar; flowers large.

1. *P.* (Rhytistelma) *albiflorum* Tab. 188 : Leaves elliptic-oblong, cuspidate; umbels with short peduncles; flowers nodding. — *Hoya albiflora Herb. Zipp.* — **Habitat**. In the rocky coastal forests of New Guinea, a plant of India, with respect to the memory of honored Wight, perhaps a distinct genus, on account of the campanulate-rotate corolla and the spongy-fleshy texture of the staminal corona, whose leaflets are somewhat wrinkled, lower side is longitudinally crested, apex revolute, sides reflexed, interior angles do not meet, and are produced into long, straight pointed apexes. **A half shrub**, twining, glabrous; branches cylindrical, twisted, thickened and knobby, older stems pale ochre, rough and with tubercles. Petiole approximately 2.5cm long, almost canaliculate on top, fleshy. Leaf 4.5 - 8 inches (long), 1 and 2/3 -2.5 inches wide, elliptic-oblong to oblong, with a constricted cuspidate apex, base somewhat rounded, texture thick and fleshy, secondary veins not conspicuous, mid-vein on leaf underside rounded and very prominent, upper side canaliculate and with warty outgrowths in the basin. Petioles of the ***peduncle*** doubly short, solitary, spreading, thickened, near the apex covered with tiny ovate-triangular bracts, many flowered umbels. Peduncle ***pedicels*** doubly long, nodding, thread-like, above thicker, calyx and corolla slightly pubescent. ***Calyx*** nearly, if not, a third of the corolla, spreading, deeply five-parted, green, at the inside base somewhat rough; segments oblong-lanceolate, of equal length,somewhat concave, acute, somewhat keeled. ***Corolla*** campanulate-rotate, divided into five parts, white, centrally red, segments erect, lobes ovate-lanceolate, acuminate, somewhat keeled. Staminal ***corona*** one third the size of the corolla, five-leaved, pale straw-yellow, shiny, with a spongey-fleshy texture; leaves set upright, flat, wrinkled, outline oval-oblong, obtuse, outside middle longitudinally crested, inside above keeled, apex revolute, lateral margins above base connivent-reflexed, interior angle produced into a long, hollow, involuted, acuminate point. ***Anther*** membrane ovate, obtuse, with, inside, paired loculis, separated, side by side. ***Retinaculum*** rhomboid, horny, black-brown, longitudinally sulcate, from the back (or lower or outer side) above base emerge two brief, nearly horizontal legs. ***Pollinia*** oblong, compressed, erect, on the outer side a straight and narrow margin, base glued to the retinacula by a leg. ***Ovaries*** two, follicle-containing, sessile, together circular, densely pubescent. ***Styles*** two, short, together disk-like, pentagonal, above apiculate, sparsely hairy, anther membranes alternate with the retinacula, which are set at the angles.

-Translated from Latin by Mark Randal

A Look at Hoya Sections

part 2

by Mark Randal

In the first part of this article (Stemma V.2, #3) two apparent major groups of complexes in the genus *Hoya* were explored. The first group consisted of sections or complexes with revolute corollas, conical coronas, squat, mostly rectangular pollinia, broadly winged translators with large caudicles, and whose flowers are borne in concave or flat racemes. These characteristics are most evident in species in sections *Acanthostemma*, *Otostemma,* and *Peltostemma*. The other major group of complexes explored in part one of this article were those species with flat or reflexed corollas, roughly horizontal corona tops, oblong pollinia, narrowly winged translators with tiny caudicles, and whose flowers are borne in convex racemes, as is most readily seen in sections *Hoya* and *Amblyostemma*, and in the *Hoya pottsii* complex. A number of sections or complexes that are possibly intermediate between these two groups were also presented (the *Hoya cumingiana* complex, section *Angusticarinatae*, and the *Hoya lanceolata* complex).

This portion of the article picks up with one group (The *Hoya polyneura* complex) which seems to be most similar to the *Hoya carnosa* complex, and then focuses on four groups which seem to form another large group of related species complexes. These four groups consist of the *Hoya macgillivrayi* complex (proposed), the *Hoya patella* complex (proposed) and section *Pterostelma* (see "Taxonomical considerations" under the entry for this section), which share several key morphological traits (similar pollinaria structure, more or less cupped corollas, and coronas with raised inner angles), as well as section *Angustialatus* (proposed), whose species may be viewed as being morphologically intermediate between section *Hoya* and the three other complexes listed above.

Recent molecular studies (Wanntorp et. al., 2006a, 2006b) suggest that *Hoya australis*, *Hoya albiflora* and *Hoya calycina*, one or more of which which have been included in genus or section *Pterostelma* in most modern sectional schemes (Blume, 1848; Schlechter, 1914; Kloppenburg, 1993), share a close evolutionary history with *Hoya macgillivrayi*, *Hoya patella* and *Hoya venusta*, campanulate species previously grouped into section *Cystidianthus* (or its synonym, section *Physostelma*) with *Hoya campanulata* (Schlechter, 1914; Kloppenburg, 1993; Burton, 1995/96). These species correspond to sections 14-16 presented here.

Also placing into a clade with *H. australis, H. macgillivrayi* and *H. patella* (called the "Australia/ New Guinea clade" by Wanntorp et. al., 2007) were *Hoya inflata* and *Hoya hypolasia*. Wanntorp et. al. hypothesized that these species share a common evolutionary history which diverges from the mass of *Hoya* species. Wanntorp (2007) also showed a distinct, shared pollinarium structure which corroborates the close relation of all species included in the "Australia/ New Guinea clade". Common pollinarium elements presented as uniting these species included a distinct bump at the lower, outer margin of the pollinia shortly above their union with the translators and/or caudicles, and relatively broad (or ovate) corpuscula (as compared to those species included in any of the groups previously studied in part one of this article).

A microphotographic series comparing the pollinaria of section *Hoya* and *Hoya pottsii* complex species (top) with species in the "Australia/New Guinea clade" (bottom). *Hoya lamingtoniae*, not studied in Wanntorp, 2006a, 2006b, 2007 is included here with the latter group, but was not linked to this group by those studies.

The differences are subtle, but consistent. The pollinaria of those species related to *Hoya carnosa* and *Hoya pottsii* have proportionally slimmer corpuscula, the species in the "Australia/New Guinea clade" have proportionally broader corpuscula and a small bump at the outer, lower pollinia margin just above their junction with the translators. This bump seems to be less conspicuous in section *Angustialatus* species, which may form a genetic link between the two groups.

Top row, L-R: *H. carnosa, H. pottsii, H. acuta, H. pubicalyx, H. cinnamomifolia*.
Bottom row, L-R: *H. calycina, H. onychoides, H. odorata, H. patella, H. lamingtoniae* (PNG-4).
Photo of *H. patella* pollinarium courtesy of Torill Nyhuus,
photos of *H. odorata* & *H. lamingtoniae* pollinaria by Dale Kloppenburg.

The Wanntorp studies of 2006 do not include any species classified here as belonging to Burton's proposed section *Angustialatus*, but as these species share the geographical distribution of those species in the "Australia/ New Guinea clade" and there appear to be intergrades or hybrid species which share morphological characteristics between *Angustialatus* and two of the three other main groups contained in the "Australia/ New Guinea clade", it is hypothesized here that these four groups share an evolutionary history which separated relatively early in the genus' history from the other species groups explored in part one of this article.

Since the publication of the first portion of this article two prime criticisms of sectional theory have been advanced by several ***Stemma*** readers: 1) the sections are "unnatural" and 2) many species may be placed in more than one section, suggesting that the sections as presented are arbitrary or unacceptably imprecise.

The first criticism may be taken as referring to the terminology of "unnatural" and "natural" groupings in taxonomy, used to designate whether described groups constitute genuinely closely related species ("natural") or groups which are based on arbitrary traits which do not denote a close genetic relationship ("unnatural"). One example of a group considered "natural" is subfamily *Asclepiadoideae* in family *Apocynaceae*. *Asclepiadoideae* are characterized by (among other traits) having radially symmetrical flowers with parts in groups of five and pollen structures formed by the connection of two waxy bundles of pollen. The genera included in *Asclepiadoideae* are accepted as being more closely related to one another than to species not included in this group, a hypothesis supported by modern molecular testing, and so are considered a "natural" group. An example of an "unnatural" group would be one which classifies all plants with red flowers as one group. This grouping is considered "unnatural", as the characteristic of having red flowers occurs in many disparate unrelated genera across the range of flowering plants.

The history of infrageneric classification of *Hoya* has based groupings on characteristics such as corolla and corona structure and orientation, pollinarium structure and vegetative morphology, all traits regarded by modern scientists as being relevant to species classification (Rintz, 1978; Kloppenburg, 1993; Burton, 1995/96; Wanntorp, 2006a,2006b,2007). As some species groups (*Acanthostemma*, *Eriostemma, Angusticarinatae*) were corroborated by recent molecular testing (Wanntorp et. al., 2006a, 2006b), it seems that at least some of the traits used to date to attempt classification within *Hoya* may be judged as yielding "natural" groupings.

The second criticism mentioned of the sections, that they may be arbitrary since some species may be placed in more than one group, seems to be based on the idea that the sections/complexes should be sharply defined and inviolable, with no interconnections amongst them. Judged by this standard, the sections do fall short.

However, this standard may not be practical for dealing with sections or complexes which seem to be inter-related, and for a genus which seems to speciate rapidly (an idea which has been advanced to this author by more than one prominent botanist). The complexes presented in this article represent some well-defined groups of morphologically similar species, but there are many species which share traits of 2 or more species groups as defined here. For instance, *Hoya kloppenburgii* T. Green has the bilobed coronal extensions characteristic of those species placed in section *Acanthostemma* and also has the coronal skirt characteristic of those species placed in section *Otostemma*. Section *Physostemma* species, to be presented in the next installment of this article, have morphological characteristics of both sections *Pterostelma* and *Plocostemma*, although the species placed in each of these three sections share enough unique morphological characteristics to consider them all as distinct, but related, complexes.

The fact that there are some species which seem to be borderline to some established sections (*Hoya serpens* is quite similar to section *Hoya* species, enough so to link it to those species, but it differs in some key traits) or which represent traits of two established sections, does not negate the sectional divisions themselves where they are well established- it only highlights the fact that these groups in many cases seem to be inter-connected, in that they may have evolved from a common ancestral group and still retain some shared traits, and/or that hybridization between the two groups exists. Borderline species, species which straddle sectional divisions, and anomalous species, which seem to bear no close relation to any other discovered species, are to be expected to occur in nature, as inconvenient as those species may be in attempting to establish iron-clad sectional divisions.

There has been some debate about the validity of some sectional names presented in this article, particularly for the name *Pterostelma* (see that entry for details). One focus of this article is to present the sections as they have been viewed by previous authors (while noting some of the ambiguities that accompany these early publications), so where possible previously well-accepted complex names are retained.

The system of naming plant groups which is governed by the International Code of Botanical Nomenclature (ICBN) is intended to provide a common framework and promote consistency in taxonomic efforts. However, structure should not be confused with substance. Whether the species currently associated with the name *Pterostelma* should be called by that name, the name *Pseudopterostelma*, "The *Hoya albiflora* complex" or another name, the species included in this group share enough similar morphological characteristics that we may make an educated guess that they are closely related species that have derived from a common ancestral species. It is important to remember that this kind of recognition of species complexes is the main goal of infrageneric classification. Taxonomy is important as well, but taxonomic argument is secondary here to the comparison of species and the theories of their inter-relatedness.

About the suggested section/complex entries:

Photo credits are as stated. Where no photographer is cited the photo is by Mark Randal.

Some approximate size parameters for floral/ vegetative descriptions in the next section:

Leaves:

small- less than 4 cm long and 2.5cm wide**.**
medium- between 4 and 10cm long, between 2.5 and 7 cm wide.
large- between 10 and 20cm long, between 7 and 10cm wide**.**
giant- over 20cm long and over 10cm wide.

Flowers (measured in diameter when pressed flat):

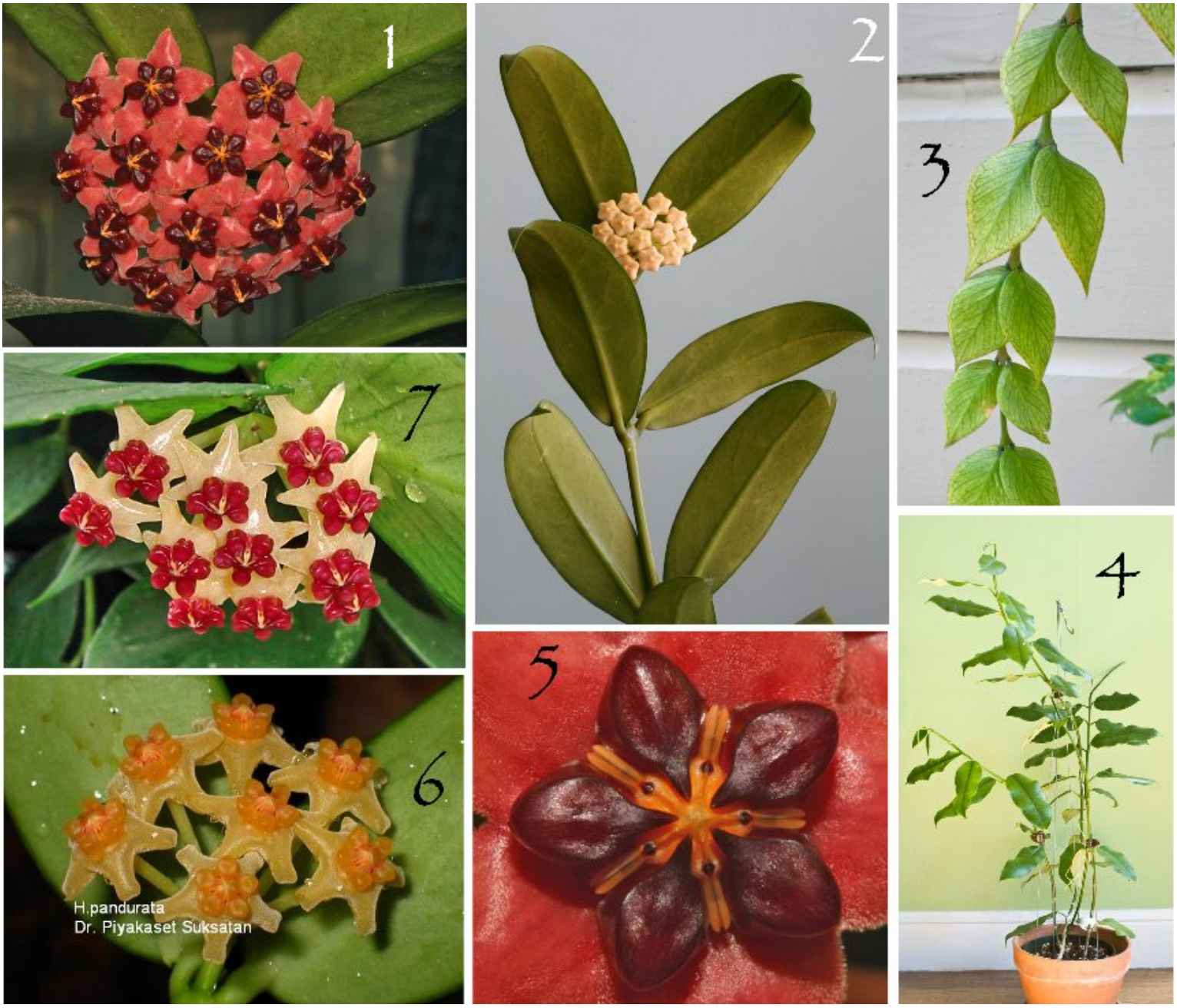
small- less than 1cm.
medium- between 1 and 2cm.
large-between 2 and 3cm.
giant- over 3cm.

12- The *Hoya polyneura* complex (proposed)

Overall form: these species are terrestrial or epiphytic sub-shrubs which do not seem to twine. Leaves are small to medium sized. Medium sized flowers are borne in relatively small clusters on short peduncles under close-set leaf pairs.
Distribution: possibly eastern India through southern China, apparently not extending much farther south than northern Thailand.
Publication: not officially published in this form.
Original description: none.
Revised descriptions: none.
Salient features:
Pollinarium: not enough samples of the pollinaria of these species have been studied by this author for him to present any findings.
Corona: inner corona lobes acute and upright, outer lobes rounded and horizontal. Overall shape of segments are oval when viewed from above.
Corolla: pubescent, lobes are reflexed, margins and apexes are revolute.
Raceme: convex.
Species thought to belong to this section/complex:

Hoya polyneura Hook. f. (type)	*Hoya lobbii* Hook. f.	*Hoya fusca* Wall. (?)
Hoya pandurata Tsiang		

Taxonomic considerations: this is a hypothetical grouping which requires much further study to confirm. The distinctly non-twining nature of these plants, coupled with certain broad similarities in peduncle, corolla and corona structure argue a close genetic relationship.
The status of *Hoya fusca* is uncertain in regards to this hypothetical grouping. If this species does prove to belong grouped here, the name of this complex should more properly be "the *Hoya fusca* complex", as *Hoya fusca* is the earliest published of the species grouped here to date.
These species (based on the incomplete current evidence) seem to be most closely related to those species in section *Hoya*, but have certain similarities to some *Hoya albiflora* relatives.



The *Hoya polyneura* complex. 1) *Hoya lobbii*. 2) *Hoya lobbii*, showing peduncle placement and non-twining growth. 3) *Hoya polyneura*. 4) *Hoya fusca*. 5) *Hoya lobbii*, close-up of corona. 6) *Hoya pandurata* (photo courtesy of Dr. Piyakset Suksatan). 7) *Hoya polyneura* (photo courtesy of Ted Green & Green: Plant Research).

13- Section *Angustialatus* C. M. Burton (proposed)

Etymology: "angusti"="narrow",L.,"alatus"="winged",L.
Type species: *Hoya flavescens* Schltr.
Overall form: twining, epiphytic vines with thin-textured medium to large-sized leaves and thin, wiry stems. Not as vigorous as most *Hoya pottsii* complex species. Sap is milky. Flowers are small (*Hoya ischnopus*) to large (*Hoya chlorantha*). Flower color varies from chartreuse (*H. chlorantha*) to mauve (*Hoya vitiensis, Hoya rubida*), but most species closely related to *H. flavescens* have yellow flowers which range from pale yellow to a dark tawny gold. Some species placed here (*H. chlorantha*) seem to lack fragrance, but many species closely related to *H. flavescens* have an intense, fruity odor similar to mango or melon.
Distribution: the epicenter of this species complex seems to be New Guinea.
Publication: Proposed in ***The Hoyan*** V.17#3(2):17
Original description: "Foliage papery to fleshy; sap milky; corolla lobes usually almost flat, but sometimes reflexed, often with more or less revolute margins; corona lobes more or less flat; pollinia keeled on outer margins; translators not apparently winged, though there appears to be a very narrow "keel" along the outer margins of the otherwise almost transparent translators. Most of the hoyas in this group are hoyas that Schlechter placed in his ***Physostelma*** section, where they definitely do not belong. Some, he included in his ***EuHoya*** section."
Revised descriptions: none.
Salient features:

Pollinarium: translators are narrow. The pollinia of all species examined by this author (only three) have a slight bump on the lower, outer surface of each pollinia, a trait which is also present in all species examined of the *H. patella*, *H. macgillivrayi* and *H. albiflora* complexes, but appears to be less pronounced in section *Angustialatus* species than in those three complexes.

Corona: similar to those of section *Hoya* species, but with more rounded edges to the upper corona lobe margins, and with the lobes broadly concave on top.

Corolla: rotate, pubescent, with recurved margins, much like those of the section *Hoya* species.

Raceme: convex to globular.

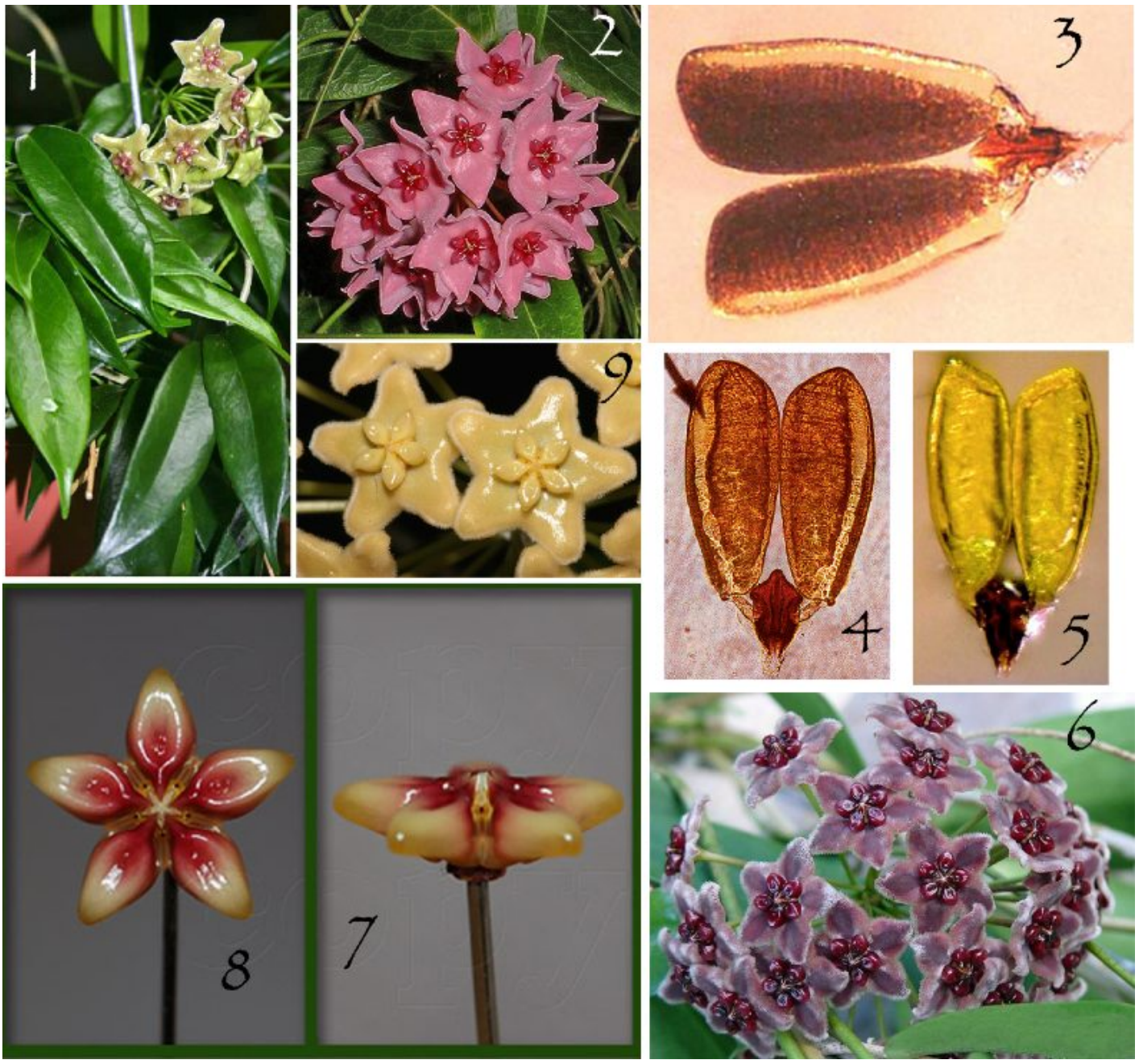
Species thought to belong to this section/complex:

Hoya flavescens Schltr. (type)	*Hoya chlorantha* Rechinger	*Hoya dennisii* P.I.Forst. & Liddle
Hoya dimorpha F. M. Bailey	*Hoya dischorensis* Schltr.	*Hoya globulifera* Blume
Hoya ischnopus Schltr.	*Hoya kenejiana* Schltr.	*Hoya lamingtoniae* F. M. Bailey
Hoya montana Schltr.	*Hoya rubida* Schltr.	*Hoya trigonolobus* Schltr.
Hoya vitiensis Turill		

Taxonomic considerations: these species, many described by R. Schlechter (1914), were originally grouped by him into sections *Physostelma* (a synonym for section *Cystidianthus*) or *Hoya*. C. M. Burton proposed section *Angustialatus* as a home for these species. Of the four theoretically closely related groups presented here as complexes 13-16, *Angustialatus* seems to be closest to the *Hoya carnosa* and *Hoya pottsii* complexes. Indeed, all of the traits of *Hoya flavescens* and its allies can be found in the species included in the *H. pottsii* complex or section *Hoya*: rotate, pubescent corollas with recurved margins (most section *Hoya* species); more or less flat coronas without a prominent rise to the inner corona lobes (most *Hoya pottsii* complex species); milky sap (*Hoya pottsii* complex species) and somewhat hard, non-succulent leaves (*Hoya finlaysonii* subcomplex species). These similar morphological characteristics suggest that there may be a genetic link between these groups, but molecular testing on specific groups would be needed to potentially corroborate this theory.

The article "*Wax plants disentangled...*" (Wanntorp, 2006a) provides molecular evidence that sections 14-16, the *Hoya patella*, *Hoya macgillivrayi* and *Hoya albiflora* complexes are closely related (they are referred to by Wanntorp et al. as the "Australia/New Guinea clade"). There is also morphological evidence to support this hypothesis, as these groups share some unique pollinaria traits (see entry for "Pollinarium", above). This group of plants, section *Angustialatus*, did not have any representative species included in the Wanntorp studies, and so molecular evidence regarding the relation of this group to the others included in the "Australia/New Guinea clade" was not advanced there. However, there is morphological evidence which suggests a genetic link between *Angustialatus* and the other groups considered here. Species with characteristics of section *Angustialatus* species and two of the other three species complexes from the "Australia/New Guinea clade" are present within the apparent boundaries of these three sections. *Hoya denisii* (included here in section *Angustialatus*) has a cupped corolla and raised inner corona lobes resembling those of *Hoya patella* complex species, *Hoya chlorantha* (included here in section *Angustialatus*) has corona segments with raised apexes and inner angles reminiscent of those species in the *Hoya albiflora* complex. *Hoya subcalva (Hoya* sp. HSI BSI-1- included tentatively here in the *Hoya albiflora* complex*)* also seems to have characteristics of both section *Angustialatus* and the *Hoya albiflora* complex. Given the many intergrades which seem to occur among these four complexes, it is assumed for the purposes of this article that they all four share a linked evolutionary history.

An example of one possible connection between section *Angustialatus* and the *Hoya albiflora* complex: *Hoya subcalva* (H. sp. HSI BSI-1) (center) shares traits with both section *Angustialatus* species (like *Hoya rubida*, left) and *Hoya albiflora* complex species (like *Hoya australis*, right).



Section *Angustialatus* (proposed). 1) *Hoya chlorantha* (photo courtesy of Bob Ely). 2) *Hoya dennisii* (photo courtesy of Eva-Karin Wiberg). 3) A pollinarium of *Hoya ischnopus* (photo courtesy of Dale Kloppenburg). 4) A pollinarium of *Hoya lamingtoniae* (PNG-4) courtesy of Dale Kloppenburg. 5) pollinarium of *Hoya chlorantha* (photo courtesy of Dale Kloppenburg). 6) *Hoya globulifera* (photo courtesy of Surisa Somadee & thailandhoyaclub.com). 7 & 8) corona of *Hoya vitiensis* (photos courtesy of Laila Jansson and the Swedish Hoya Society). 9) *Hoya kenejiana*.

14: The *Hoya patella* complex (proposed)

Overall form: these species tend to be epiphytic twining vines of smaller stature than their apparent close relatives in the *macgillivrayi* complex. Leaves are medium to small sized, generally thin-textured. Stems are wiry and thin. Flowers are large, widely and shallowly cup-shaped.
Distribution: Melanesia.
Publication: unpublished in this form.
Original description: none.
Revised descriptions: none.
Salient features:

Pollinarium: only a few pollinarium from these species were available to the author for study. It was reported (Wanntorp, 2007) that the pollinarium of *Hoya venusta* and *Hoya patella* (placed in this complex) resemble the pollinaria of *Hoya albiflora* and *Hoya macgillivrayi*, having slight bumps on the outer pollinium base adjacent to the translator junction. This trait seems to unite sections *Angustialatus* and *Pterostelma* with the *Hoya patella* and *macgillivrayi* complexes, but further study and comparison is needed.

Corona: appears ovate from above. Inner angles are acute and raised, outer angles are rounded and horizontal. The upper lobe surface is concave.

Corolla: widely cup-shaped, tending to be wider and more shallow than the corollas of species grouped in this article in section *Cystidianthus* with *Hoya campanulata*.

Raceme: convex.

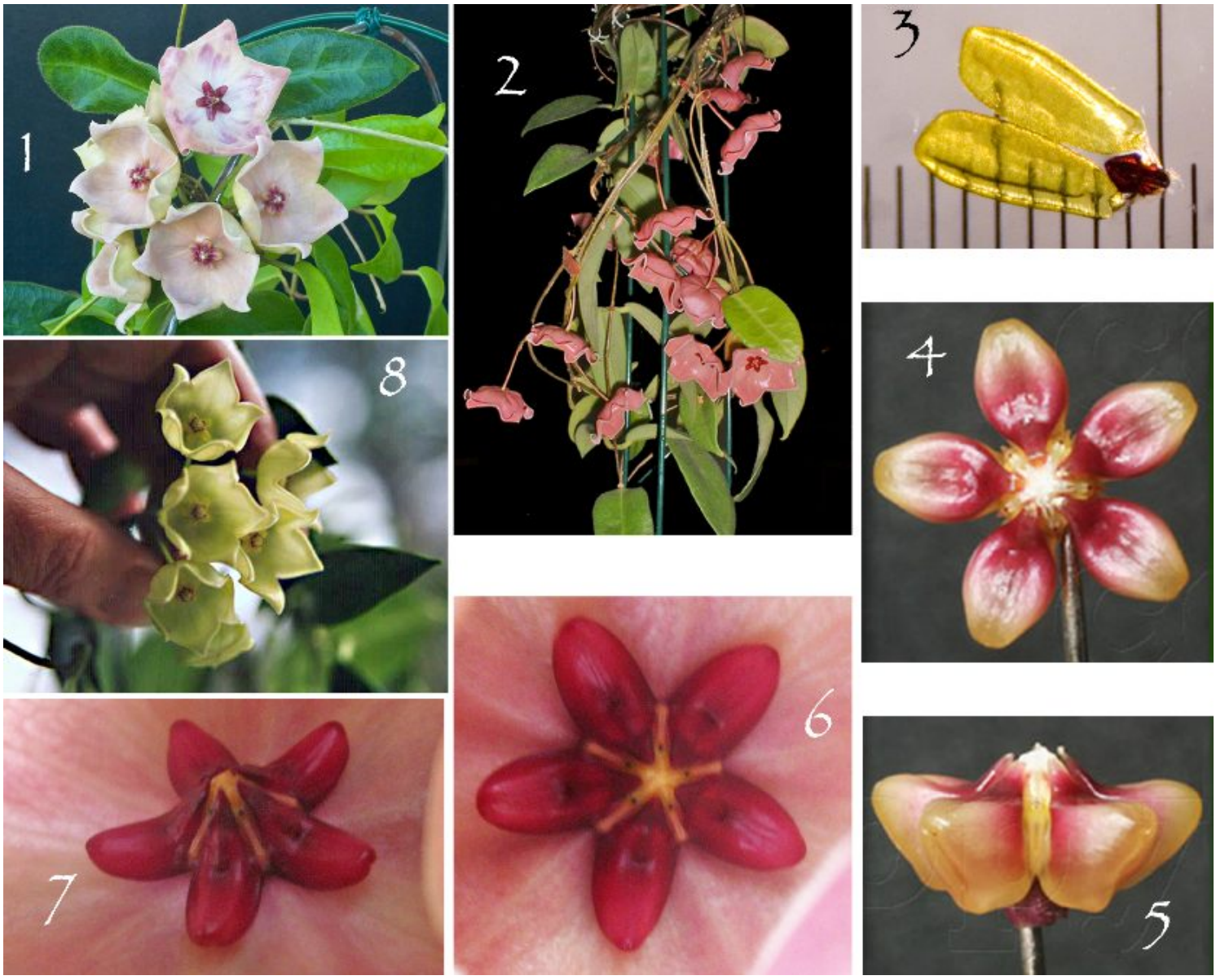
Species thought to belong to this section/ complex:

Hoya patella Schltr. (type)	*Hoya gildingii* D. Kloppenburg	*Hoya megalantha* Turril
Hoya nyhuusiae D. Kloppenburg	*Hoya venusta* Schlechter (?)	

Taxonomic considerations: these species have been traditionally included in sections *Cystidianthus* (syn. *Physostelma*) whose type is *Hoya campanulata*, whose species differ from the species included here in the *Hoya patella* group in corolla detail (the corolla lobes of the section *Cystidianthus* species are almost entirely fused, with only a minute apex and sinus, while the species grouped with *H. patella* have mostly fused petals with distinct, often reflexed apexes), pollinarium structure (the pollinaria of section *Cystidianthus* species have rounded pollinia apexes and broad translators, while the pollinaria of the *H. patella* complex species appear to have very narrow translators and their pollinia have squared, inwardly angled apexes) and overall form (the section *Cystidianthus* species are terrestrial and bushy when young, the *H. patella* complex species seem to lack this shrubby juvenile habit).

Hoya archboldiana, in the *Hoya macgillivrayi* complex, has a broad campanulate corolla similar to the species place here with *H. patella*, but the corona of *H. archboldiana* is extremely similar to that of *H. macgillivrayi*.

There are many other New Guinean species named by Schlechter (1914) that may belong here. Schlechter's drawings of floral parts are rather poorly detailed, however, so that study of live material would be necessary to place any of these species here. Unfortunately, many of these interesting species remain un-recollected.



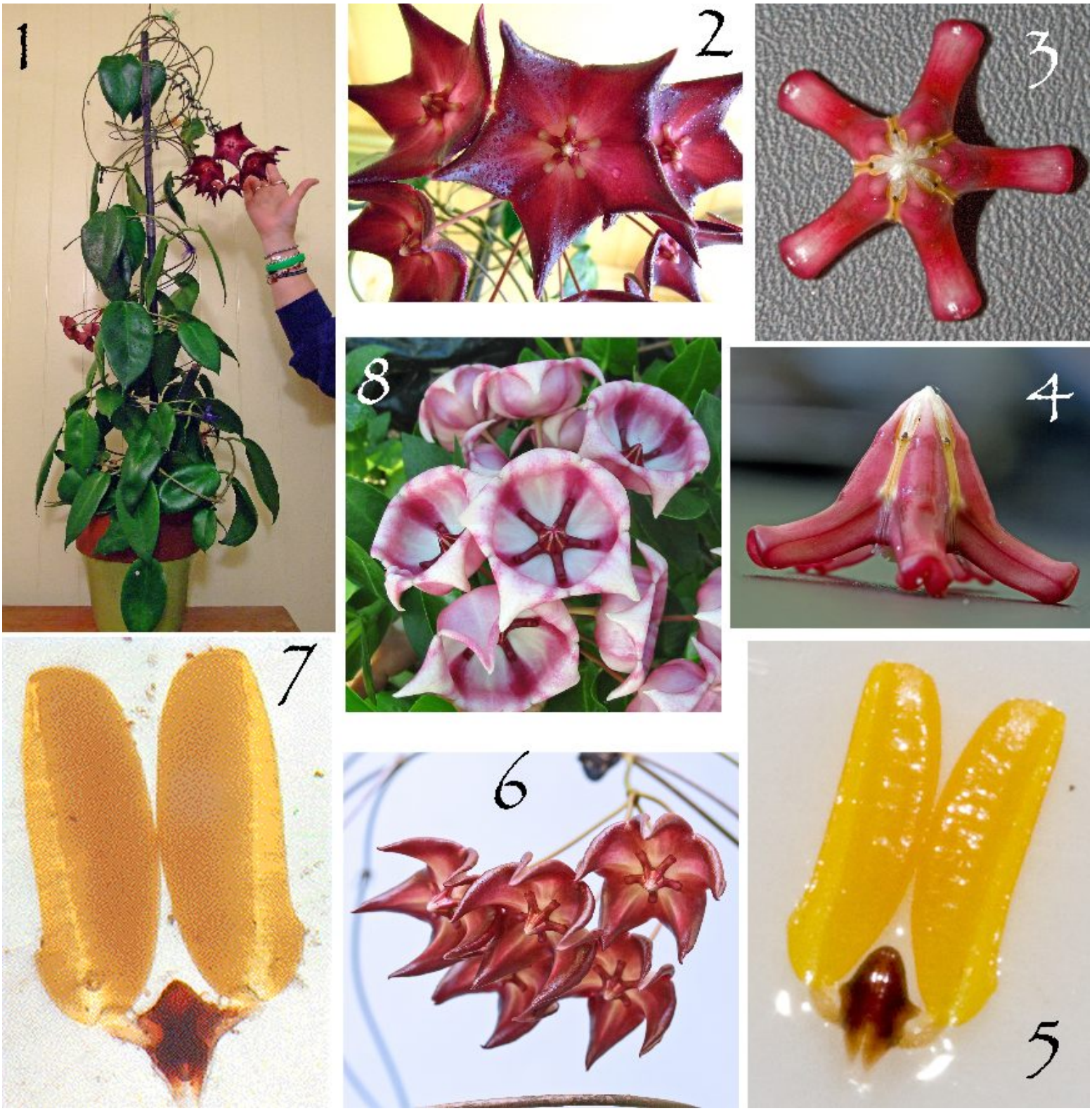
The *Hoya patella* complex. 1) *Hoya sp. aff. megalantha* (bottom three flowers) compared with a single flower of *Hoya patella* (top) (photo courtesy of Torill Nyhuus). 2) *Hoya patella* (photo courtesy of Eva-Karin Wiberg. 3) Pollinarium of *Hoya patella* (photo courtesy of Torill Nyhuus). 4 & 5) Corona of *Hoya sp. aff. megalantha* (photo courtesy of Torill Nyhuus & the Swedish Hoya Society). 6 & 7) The corona of *Hoya patella*. 8) *Hoya nyhuusiae* (photo courtesy of Torill Nyhuus)**.**

15: The *Hoya macgillivrayi* complex (proposed)

Overall form: these species are vigorous twiners that strive to climb into strong sunlight. Leaves are large, thick, dark green, and of an elongated cordate shape. Internodes are generally quite long, sometimes to over 30cm (12″). Flower size is large to giant. Flower corolla color varies, even within collections of each species, from a dark blackish-purple through true reds to bright magentas. The fragrance of the flowers of these species is intense, sometimes described as cloying.
Distribution: New Guinea and Australia.
Publication: this group of species has not been technically published as a section.
Original description: none.
Revised descriptions: none.
Salient features:
Pollinarium: translators are narrow. The base of each pollinium has a small, slightly angled protrusion at their outer margin, as in section *Angustialatus*, the *Hoya patella* complex and the *Hoya albiflora* complex.
Corona: the coronas of all of the species presented here have a prominent, rocket-like central rise, with the median corona lobes being linear, and having a squared-off, upturned apex.
Corolla- *Hoya archboldiana* has petals that are fused together to nearly the apex with brief revolute tips, forming a campanulate corolla, while the other species included here have petals which separate not far from the corona and are flattened-campanulate.
Raceme- loosely convex.
Species thought to belong in this section/complex:

Hoya macgillivrayi *F.M. Bailey* (type)	*Hoya archboldiana* Norman	*Hoya onychoides* P. I. Forster & D. Liddle & I. M. Liddle

Taxonomic considerations: these species have been included in section *Cystidianthus (*syn. *Physostelma)* by various authors (Schlechter, 1914; Kloppenburg, 1993; Burton 1995/96). The type species for section *Cystidianthus* is *Hoya campanulata*, a species with a similarly shaped corolla to *Hoya archboldiana*, but with different corolla, corona and pollinarium details and a different overall form (see the entry for the *Hoya patella* complex, under *Taxonomic considerations)*.
A number of other *Hoya* species are linked to this larger group (sections 13-16) of apparently related complexes. *Hoya megalaster* is linked by a close vegetative and pollinarium structure to those species in the *Hoya macgillivrayi* complex, and *Hoya inflata* and *Hoya hypolasia* are also linked to this group by certain vegetative features (elongated cordate leaves), pollinaria details (all share the wide corpuscula and protruding outer pollinia bases characteristic of these sections), and *H. hypolasia* and *H. inflata* have also been linked by molecular and pollinarium findings from the Wanntorp (2006a, 2006b, 2007) studies.
These three species have widely varying details of their corolla and corona, however, and so it does not seem possible to place them definitively in any of the complexes discussed here, although they seem to share most morphological similarities with species placed in the *Hoya macgillivrayi* complex.



The *Hoya macgillivrayi* complex. 1 & 2) *Hoya macgillivrayi* (photos courtesy of Doug Chamberlain). 3) corona of *Hoya onychoides*. 4) side view of corona of *H. onychoides*. 5) Pollinarium of *H. onychoides*. 6) *H. onychoides*. 7) Pollinarium of *H. archboldiana* (photo courtesy of Dale Kloppenburg). 8) *Hoya archboldiana* (photo courtesy of Monina Siar).

16: The *Hoya albiflora* complex (section *Pterostelma (Wight) Hooker f.*)

Etymology: "pteron"="wing", Gr., "stelma"="crown",Gr.
Type species: *Hoya albiflora*. (For section *Pterostelma,* the type species would be *Hoya acuminata*.)
Overall form: these species are mostly vigorous epiphytic or partly terrestrial twiners that often strive to climb into strong sunlight. Leaves are medium to large, occasionally giant, rarely small, thin to succulent, often slightly cordate in shape. Flowers generally are medium to large-sized and have white, deeply divided and slightly cupped corollas. Coronas vary in color. Most species are intensely fragrant.
Distribution: the epicenter of this complex of species seems to be New Guinea, but outlying species occur in Australia (several *Hoya australis* ssp.s), to Samoa in the east (*H. australis* ssp. *tenuipies)* and at least as far north as northern Thailand (*Hoya thailandica*). Possibly into Bangladesh if *Hoya acuminata* does properly belong to this complex, which is not clear at this time.
Publication: *Contributions to the Botany of India,* Robert Wight, 1834 (as a genus), ***The Flora of British India,*** J. D. Hooker, 1885 (as a section).
Original description (for genus *Pterostelma*): (translated from Latin by MR) "Corolla rotate, five-parted. Staminal corona five-leaved; leaves membranaceous sides reflexed, interior angle subulate, erect, tooth-like. Anthers terminated in a membrane. Pollinia masses approximately erect, corpuscula affixed at the back and base. Stigma apiculate. - Twining shrub ? or decumbent? Leaves opposite, oblong, acuminate, fleshy. Flowers large. Corolla five-parted, segments linear-lanceolate, tube pilose. Corona segments wide, laterally tightly reflexed, margins conniving, in this manner as a resting butterfly's wings."
Revised descriptions: Hooker f. (for *Hoya* section *Pterostelma*): "*Corolla* reflexed, lobes longer than broad. *Column* sessile, obconic; *coronal* processes laterally compressed, semi-cordate, 2-winged, with an erect subulate point in the inner angle. *Plocostemma, Bl*."
Salient features:

Pollinarium: there is a slight bump or protrusion on the lower, outer margins of the pollinia just above their union with the translators/caudicles. The corpuscula of these species also tends to be wider than those of section *Hoya* and *Hoya pottsii* complex species.

Corona: inner angles acute, slope up to exceed the height of the anther appendages. Outer angle is rounded and also rises to meet or exceed the height of the anther appendages. The profile of the upper surface of the corona lobe resembles a saddle. Corona segments are tall, with the narrower, lower portion of the corona lobes forming two excised, nearly distinct lobes separated by the furrow.

Corolla: rotate-campanulate, with deeply divided lobes which often reflex slightly before bending forwards, leaving the corona sitting relatively high above the corolla surface.

Species thought to belong to this section/complex:

? *Hoya acuminata* Benth. ex. Hook. f. ?	*Hoya albiflora* Zipp. ex Blume	*Hoya australis* R. Brown ex J. Traill
Hoya calycina Schltr.	*Hoya graveolens* Kerr	*Hoya leucorhoda* Schltr.
Hoya magnifica P. I. Forst. & Liddle	*Hoya microphylla* Schltr.	*Hoya naumannii* Schltr. (borderline)
Hoya odorata Schltr. (borderline)	*Hoya schneei* Schltr.	*Hoya* sp. 1 Tanna Island
Hoya sp. HSI BS-1 (borderline)	*Hoya subglabra* Schltr.	*Hoya thailandica* Thaithong

Taxonomic considerations: the name "*Pterostelma*" was originally used to describe the genus *Pterostelma* (Wight, 1834), based on *Pterostelma acuminata*. Blume placed *Hoya albiflora* into this section (Blume, 1848 (*see Reprint, this issue, page 12*)), which may have been an error. Hooker f. (1885) placed section *Plocostemma* into synonymy with a newly created section *Pterostelma*. This synonymy may also have been an error.

It is not clear which group of *Hoya* species is referred to in the original description of genus *Pterostelma*. The original genus description is open to interpretation and the holotype sheet for the type species of genus *Pterostelma, Pterostelma (Hoya) acuminata* (Wall. Asclep. #129) is seriously flawed.

Blume (1848) was the first author to refer those species blatantly similar to *Hoya albiflora* to genus *Pterostelma* by including *Pterostelma* (*Hoya*) *albiflora* there, and Schlechter (1914) built upon this interpretation by including *Hoya calycina* into section *Pterostelma*.

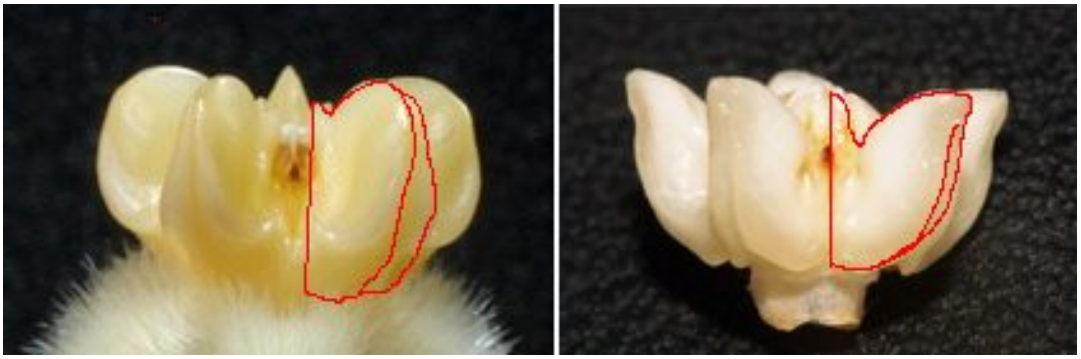
Do the species these two authors included in genus or section *Pterostelma* match the original description or type species herbarium sheet for genus *Pterostelma*? The original description for genus *Pterostelma* contains the following key phrases (as translated from Latin by this author):

1) "Corolla rotate"
2) "Staminal corona five-leaved; leaves membranaceous..."
3) "(Corona leaves) sides reflexed, interior angle subulate, erect, tooth-like."
4) " pollinia masses approximately erect, corpuscula affixed at the back and base."
5) "Leaves opposite, oblong, acuminate, fleshy."
6) "Flowers large"
7) "Corolla five-parted, segments linear-lanceolate, tube pilose."
8) "Corona segments wide, laterally tightly reflexed, margins conniving, in this manner as a resting butterfly's wings."

Do the species aligned with *Hoya albiflora* match these descriptive phrases? Let's examine them one by one.

1) Yes - the usage of "rotate" in literature of this time refers to the shape of an object as being "wheel-shaped" (see description and illustration in John Lindley's ***An introduction to Botany,*** 1835, pg. 379 for usage of the term at the this time) and does not seem to encompass shapes that are strongly reflexed or campanulate. The species aligned with *Hoya albiflora* do have flattened-campanulate, deeply divided corollas which have been referred to as "rotate" (Blume, 1848).

2) No - the usage of "membranaceous" would seem to refer to a very thin layer of tissue. The corona lobes of most *H. albiflora* relatives are not noticeably more thin than in the majority of *Hoya* species.
3) Yes - "sides reflexed" refers to the tissue of the corona top folding down and under to form the corona lobe, as is true of all *Hoya* species except for those placed in section *Otostemma*. The inner angle of the corona lobes of *Hoya albiflora* relatives are erect and tooth-like.
4) Uncertain - this phrase can be interpreted in various ways. This phrase may refer to the actual attachment of the pollinia to the translators. The pollinia of *Hoya albiflora* complex species do not appear to attach to the back side of the corpusculum. One botanist has interpreted this phrase to mean that the pollinaria are situated in reverse of all other *Hoya* pollinaria, with the corpusculum closer to the anther head than the pollinia. This characteristic does not seem to be found in any known species similar to *Hoya albiflora* or in any other known *Hoya*.
5) Maybe - this describes the leaves of most *Hoya albiflora* relatives.
6) Maybe - most *Hoya albiflora* relatives have medium sized flowers, although some such as *albiflora* itself have comparatively large flowers.
7) Maybe- some *H. albiflora* relatives, such as some clones of *Hoya australis*, have reflexed corolla lobe margins, so that they appear linear-lanceolate at anthesis.
8) Yes - if this author interprets this phrase correctly. The corona lobes of *H. albiflora* and most species similar to it appear as a sitting butterfly in profile, with the "conniving margins" of the coronal tissue bottom running up along the outside of the corona lobe, forming the appearance of two wings pressed together.



Left: one interpretation of the phrase "corona segments... margins conniving, in this manner as a resting butterfly's wings" as applied to *Hoya lasiantha* (left) and *Hoya australis* ssp. *oramicola* (right). Photo of *H. lasiantha* courtesy of Torill Nyhuus.

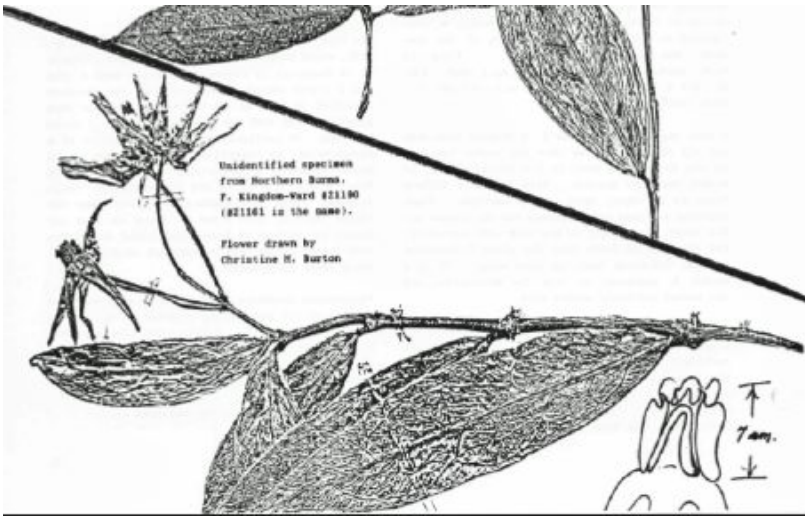
The characteristics of those species similar to *Hoya albiflora* therefore match well to some aspects of the genus description of *Pterostelma*, not so well to others, and with some descriptions a concrete similarity is difficult to determine due to the vagueness of the original description.

Hooker f. (1885) placed section *Plocostemma* in synonymy to his newly re-ranked section *Pterostelma*. King & Gamble (1910) accepted this synonymy, but later authors (Schlechter, 1914; Kloppenburg, 1993) did not. Was Hooker f. correct in placing *Plocostemma*, with its type species *Hoya lasiantha*, here? Let's compare whether the known section *Plocostemma* species (consisting of only *Hoya lasiantha* and *Hoya praetorii*) match well to the genus description of *Pterostelma*, using the same eight key phrases as applied to *H. albiflora*, above.

1) No - *Plocostemma* species have strongly reflexed, not rotate corollas.
2) No - the coronal tissue of *Plocostemma* species does not seem to be especially thin compared to most *Hoya*. For good illustrations of the relative thickness of the coronas of a variety of *Hoya* species (including *Hoya lasiantha*), see "*Hoyas of the Malaysian peninsula" (Rintz, 1978)*. Most species discussed there have cross sectional views of the corona lobes.
3) Yes - the inner corona angles are as erect in *Plocostemma* species as are those of *Hoya albiflora* relatives.
4) Uncertain - see point four above in the *Hoya albiflora* comparison.
5) No - leaves of *Hoya lasiantha* and *Hoya praetoria* are coriaceous or sub-coriaceous, not fleshy.
6) Yes - the flowers of *H. lasiantha* and *H. praetorii* are large sized compared to most Hoya species.
7) Maybe - the corolla lobes of *H. lasiantha* and *H. praetorii* have reflexed margins and appear nearly linear lanceolate at anthesis.
8) Yes - with the same stipulation as in point 8 in the *H. albiflora* comparison above.

It seems that neither the *Hoya albiflora* complex nor section *Plocostemma* can be concretely linked to genus *Pterostelma* by comparison with *Pterostelma*'s original description- both groups have some common points but neither agrees with all apparent points of the *Pterostelma* description. It also does not seem possible to rule either group out conclusively as being linked to *Pterostelma* based on the type description.

In most cases the type sheet for the type species of a taxon would determine that group's ultimate status. The type species of genus *Pterostelma* is *Pterostelma* (*Hoya*) *acuminata*, and its type sheet is Wall. Asclep. #129. Christine Burton has relayed the information in personal communications with this author that Douglas Kent (A *Hoya* researcher working in the 1970s and '80s) determined that *Hoya acuminata* was synonymous with *Hoya myanmarica*, based on comparison of their type sheets (the type sheet for *Hoya myanmarica* is apparently Kingdom-Ward #21190, although the original description for this species was not obtained by this author for verification). Burton reported that Kingdom-Ward #21190 showed flowers which placed that species in section *Plocostemma*, thus supporting Hooker. f.'s placement of *Plocostemma* into synonymy under *Pterostelma* (see detail of Kingdom-Ward #21190, right, with illustration from dried floral material by Ms. Burton). Ms. Burton also reported that she had obtained an image of Wall. Asclep. #129 recently and that after careful observation had determined that the material represented there matched perfectly to Kingdom-Ward #21190, making in her opinion *Hoya myanmarica* a synonym of *Hoya acuminata*, and upholding Hooker f.'s placing of section *Plocostemma* as a synonym to taxon *Pterostelma*.



This author also obtained an image of Wall. Asclep. #129. Since this sheet is held in the collection at Kew, and Kew is quite particular about the publication of material held in its herbarium, the image of Wall. Asclep. #129 will not be presented here at this time.

For the sake of this discussion, three main questions must be considered in interpreting the material affixed to Wall. Asclep. #129 and Kingdom-Ward #21190: 1) does the material on Wall. Asclep. #129 match definitively to the *Hoya albiflora* complex or to section *Plocostemma*, 2) does this material match definitively to that of Kingdom-Ward #21190, and 3) does the material on Kingdom-Ward #21190 match definitively to section *Plocostemma*.

The answers to these questions seem to be "no" in all three instances.

The material on Wall. Asclep. #129 is comprised of six branches, most set closely with pairs of medium to small ovate-acuminate leaves. There are no flowers affixed to this sheet in any way. The lack of floral material on this sheet precludes its being definitively matched to any living or dried material.

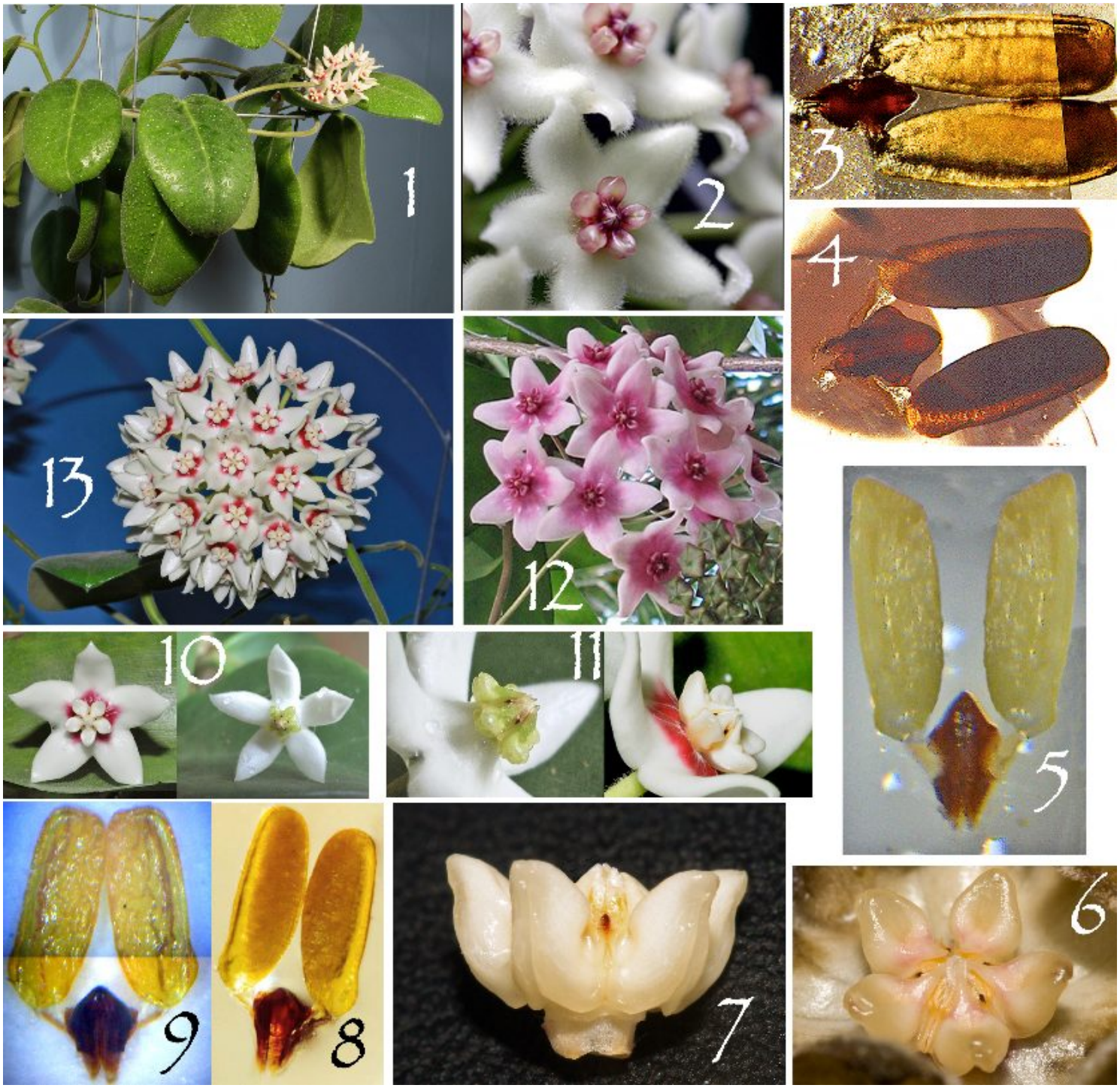
The floral illustration drawn over the copy of Kingdom-Ward #21190 (by Ms. Burton) does seem similar to the floral structure of *H. lasiantha* and *H. praetorii* in that the corona segments are quite tall and somewhat laterally compressed, but better images of these flowers or, preferably, from living material matched to Kingdom-Ward #21190, would seem to be necessary to conclusively match this material to section *Plocostemma*. The linking of Kingdom-Ward #21190 to Wall. Asclep. #129 has less to recommend it- although the leaves may be of similar size and shape, and the collection areas of the two specimens are not relatively far apart, the lack of floral material on the Wallich sheet is a nearly fatal flaw. Only molecular testing may be able to provide a relatively certain link between the two sheets.

In short, the information attainable from Wall. Asclep. #129 does not answer any of the questions surrounding these groups definitively. The most that can be realistically determined from this sheet at this time is that the material affixed to it bears a resemblance to the vegetative material present on sheet Kingdom-Ward #21190.

Given the flawed nature of the type sheet for Wight's genus *Pterostelma* and the vagueness of this genus' original description, it would seem the best course of action would be to disregard the name "*Pterostelma*" altogether. Additionally, the name *Plocostemma* should not be reduced to synonymy under *Pterostelma* based on a series of currently unverifiable assumptions.

The best of the options for an official name for the *Hoya albiflora* complex would seem to be the proposed section "*Pseudopterostelma* C. M. Burton" as outlined in ***The Hoyan*** (1995/96). This section, with the type species *Hoya albiflora*, would be unambiguous and should have relatively few taxonomic problems. This name has not been officially published, however.

There is a sub-complex of species that seems to belong within the *Hoya albiflora* complex comprised of *Hoya odorata* (and perhaps a few similar species) from the Philippines. Most morphological characteristics of *Hoya odorata* agree quite well with those species placed in this section, especially the details of the corolla and pollinarium. *Hoya odorata* also resembles *Hoya thailandica* (a *Hoya albiflora* complex species) in leaf structure. The corona of *H. odorata* is somewhat different, however (see montage, page 31). *Hoya odorata* has hybridized with *Hoya schneei*, producing the hybrid *Hoya* 'Iris Marie'. This may corroborate a close genetic link between the *Hoya albiflora* complex and the *Hoya odorata* subcomplex.



The *Hoya albiflora* complex: 1) *Hoya calycina*. 2) *Hoya graveolens* (photo courtesy of Surisa Somadee). 3) Pollinarium of *Hoya leucorhoda* (photo courtesy of Dale Kloppenburg). 4) Pollinarium of *Hoya australis* (photo courtesy of Dale Kloppenburg). 5) Pollinarium of *Hoya schneei*. 6) Corona of *Hoya schneei*. 7) Corona of *Hoya australis* ssp. *oramicola*. 8) pollinarium of *Hoya odorata*. 9) pollinarium of *Hoya calycina*. 10) Comparison of *Hoya calycina* (left) and *Hoya odorata* (right). 11) Comparison (side view) of *Hoya odorata* (left) and *Hoya calycina* (right).

To be continued in volume 3, #1.

Department of Corrections

In Stemma V.2, #3 in the article "A Look at *Hoya* Sections":

The species name *Hoya juannguoiana* was misspelled as "*Hoya juanngoiana*".

The species name *Hoya loheri* was misspelled as "*Hoya loherii*".

On page 47 the species name *Hoya kerrii* is misspelled as "*Hoya kerii*".

Source Material

for "A Look at Hoya Sections part 2"

Blume, C. L. 1848. *Rumphia* 4: 29--33

Blume, C. L. 1849. *Museum Botanicum Lugduno-Batavum* 3: 43--46 & 4: 57--60

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Back page

Dischidia aff. *lanceolata* IPPS 7385

Country of Origin: Bali, Indonesia.

Related/Similar Species: based on floral characters, this species is very closely related to *D. lanceolata*.

Flower Color: purple/lavender with white spots.

Flower Size: c. 9.53mm by 6.35mm (at the base).

Flower Form: urceolate.

Scent: none detectable.

Leaf size: c. 5cm x 1.2cm.

Collector: Ruurd Van Donkelaar.

Temperature range: seems to tolerate temps up to 32C but does better kept a few degrees lower.

Water Requirements: likes to dry out slightly between watering.

Light Requirements: filtered sun to bright shade suits this one best.

Cultivation notes: this species has proven to be tricky for me. It routinely drops older leaves which will make you think it is dying. This plants really needs high humidity. Care must be taken not to over water the soil mix. Shipping cuttings is difficult as they often desiccate en route.

-Antone Jones

***Dischidia* aff. *lanceolata* IPPS 7385**

Photographs by Antone Jones.