Acknowledgments

This study started out at the suggestion of David Liddle of Mareeba, Queensland, Australia. David called and encouraged me to write up the “Section Acanthostemma” since so many of its species were found in the Philippines where I have concentrated my studies. Many species have, over time, been placed in the incorrect section. It has been stated that the sections were useless and that few people understood them. Moreover, they were not being used as study tools in understanding this complex genus. My study of one section soon expanded to the study of all sections and their origin and organization.

It was not long before after much compiling, that I found I was generating as many questions as answers. Some questions I couldn’t answer. I was soon seeking help namely from Professor Benjamin Stone. Dr. Stone is working on the “Philippine Flora Project”, a full time job. In spite of time constraints; Ben took the time to provide me with invaluable assistance. He has been most gracious in giving me advice on organization, translations, form and substance and above all, motivation. I guess I should add education. I have found his “tutoring” process to be immeasurably valuable and worthwhile. I wish here to publicly express my deep gratification and thanks for all his assistance.

It is my wish that others will find herein a useful tool and stepping stone towards a fuller and better understanding of this complex Genus Hoya.

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P.S. I have room here to express my thanks to Dr. J.F. Veldkamp of Leiden, The Netherlands who took the time to point out a lot of errors and a conflict in my sectional key. Thanks to him these have now been corrected and entered.

Published and printed in U.S.A.
by Dale Kloppenburg
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Hoya Sections by Dale Kloppenburg

I. Introduction

Under the International Code of Botanical Nomenclature (ICBN) a plant can be assigned to taxa of the following ranks below Genus and of higher status than species (in descending sequence): subgenus, sectio, subsectio, series, and subseries. To date the Genus Hoya has been subdivided into subgenera and sectio (sections). Since only one subgenera was ever designated I will discuss this later. The sectional divisions are established in an attempt to group species with recognizably similar characteristics together. By descriptions based on a species Type in each section it is hoped in this way to delineate as precisely as possible the probable phylogeny, and to bring out the salient structures which indicate relationships. A section is a taxonomic category. Sections if natural have evolved over time just as a species or genera has. As a better understanding of the entire complex of hoya species has grown so to have more sections been defined; several originally as genera in their own right. Eventually many of these genera were incorporated into the genus Hoya. Since they represented a delineated species or group of species it was natural that they were incorporated as sectional representatives of this complex genus.

Articles #21 and #22 of the ICBN establish the rules for subdivisions of genera. See appendix #1 for these specific rules.

These sections when organized and studied can be an invaluable aid to species identification. In addition through this grouping of species into sections a better understanding of the relationships of development and evolutionary progression should evolve. This work is not complete and additional sections need to be created. The section Hoya needs further delineation and division into additional sections to avoid what Dr. Ken Hill (1) has termed the "amorphous remainder or paraphyletic residue". Actually a sort of dumping ground for species which we are not able to classify within other sections. This is due mostly to the short comprehensive nature of this sectional description. Dr. Hill has added some additional delineation's. As for the need of further refinement and additional sections, I am establishing four new sections. (1) One further defines and differentiates a group of species loosely associated with the Section Sperlingia (Vahl) Miquel (Acanthostemma). Some of the included species have previously been placed in the Section Otostemma (Blume) Miquel. (2) One other to house the monotypic species H. heuschkeliana Kloppenburg. (3) another to segregate out the two presently known species which have rudimentary pellucid margins on their pollinia outer edges, namely H. darwinii Loher and H. mitrata Kerr. (4) The last to cover the species allied with H. meliflua (Blanco) Merrill.
The first sectional divisions of the Genus Hoya was made by G. Don in 1837, followed by Endlich in Genera Plantarum (136-1840) pub.? 1841, some references say 1838 and by Decaisne, Blume, Miquel & Zollinger, J. D. Hooker, K Schumann, King & Gamble, S. H. Koorders, R. Schlechter and K. Hill. (see authors under Sectional descriptions).

II. A List of Synonyms of Hoya R. Brown

1834 Physostelma Robert Wight, Contributions to the Botany of India 39. P. wallichii Wight = (Hoya campanulata Blume).
1834 Pterostelma Robert Wight, Contributions to the Botany of India p.39. Type: P. acuminata = (Hoya acuminata Hooker f.).
1838 Cyrtoceras Bennett, Plantae Javanicae Rariorae p.90, t.21. Type: C. reflexum Bennett = (Hoya campanulata Blume).
1848 Otostemma Blume, Rumphia 4:30. Type: O. lacunosum Blume = (Hoya lacunosa Blume).
1848 Cathetostemma Blume, Rumphia 4:30 Type: C. laurifolium Blume = (Hoya laurifolia (Bl.) Decaisne.
1849 Plocostemma Blume, Museum Botanicum Lugduno-Batavum 1:59 fig.14. Type: Pl. lasianthum Blume = (Hoya lasiantha Korth.).
Mentioned by name in Rumphia 4:30 (Genus) by Blume (1848).
1849 Acanthostemma Blume, Museum Botanicum Lugduno-Batavum 1:57.
No Type mentioned.

III. The Type Descriptions of these Genera Follows

Acanthostemma Blume


Calyx quinquepartitus. Corolla rotata, quinquefida, laciniiis revolutis. Coronae stamneae pentaphylla, gynostegio abbreviato adnata, foliolis sagittatis carnosa erectis, angulo

Translation:

Calyx 5 parted. Corolla rotate, pentamerous, with the lobes revolute. Corona of 5 segments, adnate to the short gynostegium, segments sagitate, fleshy, erect, with the superior (inner) angle produced into a tooth, incumbent upon the anther. With the anther terminal membranaceous, incumbent upon the Stigma. Pollinia affixed at the base erect somewhat divergent, oblong with compressed narrow sides. Stigma apiculate. Follicles (seed pods) smooth. Many seeds with a hairy-tufted umbilicus. Herb, falsely parasitic, rooting climber, widely dispersed in insular Asian tropics and New Guinea; foliage fleshy opposite or verticillate (whorled); umbels or racemes shaped like umbels often many flowered; with flowers small dark or light (dilute) purplish.

Cathetostemma Blume

In Rumphia 4 (1848) 30.

Calyx quinquepartitus. Corolla rotata, quinquepartita, laciniiis reflexis. Corona staminea pentaphyllia, gynostegio abbreviato adnata; folioliis scutiformibus, carnosis, erectis, convexis, basi bifidis, apice attenuatis et angulo interiore in dentem antheræ incumbentem producto. Antheræ membrana stigmati appressa terminatae. Pollinia ellipsoidae, compressae, basi affixa, erecta. Stigma umbonatum.--Frutex Timorensis, volubilis; foliis oppositis, oblongis lanceolatis, coriaceis, subvenosis, glabris, supra petiolum glanduliferis; umbellis brevißimis pedunculatis, axillaris et interpetiolaribus, multifloris; floribus longissimis pedicellatis, mediocribus, flavo-viridulis.

Translation:

Calyx pentamerous. Corolla rotate, pentamerous, the lobes reflexed. Corona of 5 segments, adnate to the short gynostegium; corona segments shield shaped, fleshy, erect, convex, with the base bifid, at the apex narrowed and with the lower side, prolonged into a tooth lying upon the anther. With the terminal membrane of the anther appressed to the stigma. Pollinia ellipsoidal, compressed attached at the base, erect. Stigma dome shaped. A shrubby climber of Timor, with leaves opposite, oblong lanceolate, leathery, slightly veined, glabrous, with glands above the petiole; umbels very shortly peduncled, from the axils and between the petioles, many flowers on very long pedicels, medium-size, yellow-green.
Centrostemma Decaisne

In Annales des Science Naturelles 9 #2 (May 1838) 271.


Translation:

Calyx pentamerous. Corolla deeply divided into 5 reflexed lobes, with a prominent beard about the base of the gynostegium. Corona of 5 stamens, attached at the upper part of the elongated gynostegium; corona segments fleshy, upright, depressed above, with the lower margins inrolled, at the base prolonged into a spreading or horn-like spur, at the apex narrowed into a tooth longer than the stigma. With the terminal membrane of the anther oppressed to the stigma. Pollinia affixed at the base, erect, oblong, compressed, here with a sub transparent margin. Stigma apiculate. Follicles single, elongate, cylindrical, smooth. Seed hairy-tufted. ---The climbing plant growing in the Indian Archipelago, the Moluccas and the Philippines with leaves opposite, leathery, somewhat veined, glabrous; with the many flowered umbels pedunculate between the petioles and terminal. With flowers often rather large, yellowish.

Note: this and the following genus (Cyrtoceras) are to be combined as they have the same Type species. Cyrtoceras becomes a heterotypic Synonym.

Cyrtoceras Bennett

In Pl. Jav. Rar. (4-7 July 1838) 90 t.21.

Translation:

Corolla rotate, pentamerous, the lobes reflexed. Staminal tube long erect; corona pentamerous, its segments lanceolate, erect with the base produced into a recurved horn. With the anther terminating in a membrane, with the pollen masses attached at the base, conivent, compressed. Stigma disc depressed. Style elongated. A shrub with opposite, membranaceous leaves. With the umbels between the petioles and terminal, pedunculate, many flowered. Flowers rather large with a hairy ring in the throat.

Cystidianthus Hassk.

In Tijdschrift van Natur. Geschieden Physiol. 10 (1834) 125.


Translation:

Calyx pentamerous. Corolla somewhat campanulate, shallowly 5 lobed, at first the lobes spreading, later reflexed. Corona of 5 segments, fused to the short gynostegium; corona segments fleshy, spreading, flattened with the lower margins inrolled, the exterior angle rising upward, interior produced into a tooth lying upon the anther. With the terminal membrane of the anther appressed to the stigma. Pollinia attached at the base, erect, oblong, flattened, here with an almost transparent margin. Stigma convex 5-sided blunt. With the seed pod solitary through abortion, elongate, cylindrical, smooth. Seeds hary-tufted. Shrubs of the Indian Archipelago with the general appearance of a Centrostemma.

Note: this genus becomes a heterotypic synonym of the genus Physostelma Wight since they both have the same type species.

Otostemma Blume

In Rumphia 4 (1848) 30.

Calyx quinquepartitus. Corolla rotata, quinquefida, laciniis revolutis. Corona staminea pentaphylla, gynostegio elevato adnata; foliolis navicularibus, carnosis, divaricatis, supra

Obs. Ad Hoya recedit dentibus coronae stamineae supra antheras productis, eujus foliola subtus esuicata singula appendice bidentata sunt praedita, nee non antheris simpleibus haud membrana terminatis. Alias quoque stirpes sub Hoya militantes ad hoe Genus referandas esse probable videtur; qua de re dilligens florum exploratio docebit. Nomen derivatum ad oto, aures, et stemma, corona.

Translation:

Calyx pentamerous. Corolla rotate pentamerous, the lobes revolute. Corona of 5 segments, adnate to the elevated gynostegium; corona segments boat shaped, fleshy, spreading widely, above concave, with the interior angle prolonged into a tooth overtopping the anthers, and beneath with 2-toothed enlarged, appendix bent downward. With the anthers incumbent on the Stigma, with the apex simple, acute. Pollinia attached at the bases, close together, linearly compressed. Stigma scarcely apiculate. Follicles smooth. Seeds many, with a hairy-tufted umbilicum. Herbs of the Indian Archipelago, rooting in trees; leaves opposite or rarely whorled, fleshy, glabrous, umbels with moderately long peduncles; with small white flowers.

Observation. Differing from Hoya in the corona segments being produced above the anthers, and each segment with a groove beneath but furnished with a single 2-toothed appendix, and also the simple anthers not terminating in a membrane. Each Hoya of the Genus till now was grooved below, it seems probable this represents a mutant; but the floral structure must be diligently observed. The name is derived from oto, ear, and stemma, crown.

Physostelma Wight

Note: Section Cystidianthus (Hasskarl) King & Gamble is a Synonym based on the same Type species. In addition King & Gamble in Materials for the Flora of the Malaya Peninsula, it was used as a Section but without description.

In Contributions to the Botany of India (1843) 39.

Translation:

Calyx pentamerous. Corolla rotate, spreading, the 5 lobes spreading wavy. Corona of 5 segments, these are inflated, with opposite anthers. Anthers terminated by a membrane. Filaments 2-parted from the base to the apex, the shanks with each segment on both sides closely approaching its neighbor, filaments 5 with the anthers and corona segments alternating, together forming a body opposite the stigma. With the pollen masses basely attached, erect, almost cylindrical. Stigma depressed. --Indian and Java climbing shrubs. Leaves opposite, fleshy; umbels lateral on long peduncles, few flowered, flowers large..

**Plocostemma Blume**

In Museum Botanicum Lugduno-Batavum 1 (1849) 57. Name mentioned in Rumphia 4 (1848) 30.


Translation:

Calyx pentamerous. Corolla pentamerous the lobes spreading or reflexed, near the base inside with a tuft of matted hairs. Corona pentamerous, adnate to the somewhat sessile gynostegium, the compressed segments fleshy, erect, pleated beneath, with the interior angle prolonged into a tooth lying upon the anther. With the anther terminating in a membrane lying upon the stigma. Pollinia erect, oblong, compressed, attached at the base here marginate. Stigma aciculatum. Follicles not known. Twining shrub of the Indian Archipelago; leaves opposite, leathery somewhat veined, glabrous; with the umbels pedunculate terminal or between the petioles, many flowered.

**Pterostelma Wight**

In Contributions to the Botany of India (1834) 39.
Corolla rotata, 5-fida. Corona staminæa 5-phylla; foliolis membranaceis lateribus reflexis, angulo interiore in dentem subulatum erectum producto. Antherae membrana terminatae. Massæ pollinis erectæ, approximatae, ad dorsum corpusculi basi afixæ. Stigma apiculatum. -- Frutex volubilis ? aut decumbens ? Folia opposita, oblonga, acuminata, carnosa. Flores majusculi. Corolla alte 5-fida, segmentis lineari-lanceolatis, tubo piloso. Coronæ foliola lata, lateribus arete reflexis marginibusque conniventibus, ita ut Papilionis sedentis alæ. (In English when this was considered a separate genus) This genus is allied to Hoya both in habit and in the structure of the flowers, differing principally in having foliaceous in place of fleshy crown-leaves, and in the dorsal not lateral attachment of the pollen masses to the corpuscle.

Translation:

Corolla pentamerous, rotate. Corona 5-segmented, the segments membranaceous, with the sides reflexed, the interior angle produced into subulate tooth. With the anther terminating in a membrane. Pollen masses erect, close together, basely attached to the back of the corpuscle (retinaculum). Stigma apiculate. --Twining shrub or prostrate ? Leaves opposite, oblong, acuminate, fleshy. Flowers somewhat large. Corolla not deeply 5 lobed, with the lobes linear-lanceolate, the tube shaggy within. Corona segments broad, the sides strongly reflexed and the margins connivent, in the manner of the wings of a sitting butterfly's.

Schollia Jacq. f.

In Ecl. Pl. Rar. 1:5 t.2. (1811). (unable to acquire a copy of the original text).

Sperlingia Vahl


Sperlingia

Botaniken synes Konig Christian den 4de meget at have yndet. Han stiftede ikke allene ben første offentlige botaniske have her I Landet, men anlangde og en dor fig selv bed Rosenborgs Slot. Til Opserer over benne satte han Otto Sperling. Vel harbenne ikke efterladt fig andet Bevis paa sin kundskab am Værter, end bolt en Fortegnelse over Haven ban forestod, Hortus Christianæus Hafn., men hans Samtidge, der vare I Stand til at bedomme ham I benne henseende, ansaae ham for at være vel bedandrit deri. Maskee, ifald han ikke var bleven idbviklet med Corfitz Ulfeld, han havde aflagt flere prover paa sin kundskab. Mange gives, som ikke have bidragt mere, og adskillige mindre til Bidenskabens, Underdelse, end Sperling, efter hvilke man har opkaldet planter. Teg troer, att bet saaledes kan indskyldes, at jeg har villet bevare bennes Minde fom Botanist
Slägten, som jeg har benævnt efter ham, beter ligesom forrige til Contortæ, udmærker far de børige Slägter ved at de aflange kronblade ere baade, hvorved de faae et Utseende, som om de vare dobbelt trekantede, den ene Vinkel indad vendt, de to udad, og hver af disse endende fig I en lidt længere fremstaaenden Spidse. Saavel Figuren af Nummularia lactea major Rumph. amb. 5. t. 175., som Blomstermaaden og Beskrivelen af koronen, passer saa fuldkommen til de 2de Værter, som jeg her leveter beskrevne, at jeg ikke tvivler om, at de hore til benne Slägt. Teg anseer endog den han kalder Nummularia lactea major tab. 175. f. 1. at være samme med den jeg kalder Sperlingia opposita.

Character Essentialis.


Translation: (by Dr. Bertel Hansen of the Botanical Museum at the University of Copenhagen, Denmark).

.......King Christian the 4th apparently loved botany. Not only did he establish an official Botanical Garden in the county, but he also arranged a private garden at the Rosenborg Castle. To supervise his private garden he employed Otto Sperling. This man did not leave other proof of his knowledge about plants except a mere list (of plants) of the garden, he supervised, in Hortus Christianaeus Hafn.(iensis), but his contemporaries, capable of evaluating him in this connection, considered him to be well founded in this (i.e. knowledge of plants). May be, if he had not been connected with Corfitz Ulfeld (sentenced for high treason), he would have given more examples of his knowledge. Plants have been named after many, who did not contribute more, and several less, to the spread of science, than Sperling. I think. it may therefore be excused that I have wanted to preserve the memory (of Sperling as a botanist).

The genus, I have named after him, belong as the former to Contortæ, distinguished from the other genera by the elongate petals being in the apex and laterally inflexed hereby appearing double triangular, one angle pointing inwards, two outwards, and each of these terminating in a slightly protruding tip (very hard to imagine; the Latin text is easier). The illustration of Nummularia lactea major Rumph. amb. 5. t. 175., and the description of the corolla are in close agreement with the 2 plants, I describe here, and do not doubt that they belong to this genus. I even consider the one he calls Nummularia lactea major tab. 175. f. 1. to be the same as I call Sperlingia opposita. (bracketed remarks are Dr. Hansen’s) italics are mine.

Essential Character.

Contort. The simple star shaped nectary covering the genetilia. Petals 5, flat with the triangular apices and margins inflexed, rolled longitudinally (lengthwise).
IV. Sections of Hoya R. Br. Originally Published as Such

(1) Invalid names (not usable under the current nomenclature rules):

1837  **Hoyae Verae** G. Don, General System of Gardening and Botany 4:125, no type mentioned.
1856  **Eu-Hoya** Miquel, Flora van Nederland Indië 1:516, no type mentioned.
1885  **Euhoya** Hooker, J. D., Flora of British India 4:53.

(2) Valid names:

1837  **Hoya** in General System of Gardening and Botany, G. Don 4:125. Type: **Hoya carnosa** R. Brown. The section was automatically created (as an "autonym") with the division of the Genus into sections. (see appendix under Article 6.8 and 22.2).
1883  **Ancistrostemma** J. D. Hooker, in Flora of British India 4:53. Type: **Hoya edeni** King ex Hooker.
1911  **Kloiphora** King, in Journal of the Royal Asiatic Society, Bengal Branch "Flora of the Malayan Peninsula" 2:559. Type: **Hoya curtisii** King & Gamble.
1913  **Oreostemma** Schlechter, in Botanische Jahrbücher 50:105. Type: **Hoya oreostemma** Schlechter p.126.
1913  **Eriostemma** Schlechter, in Botanische Jahrbücher 50:106. Type: **Hoya coronaria** Blume p.135.
1916  **Peltostemma** Schlechter, in Beihefte zum Botanischen Centralblatt 43 #2 p.15, "Neue Asclepiadaceen von Sumatra & Celebes" Type: **Hoya maxima** (Karst.) Warburg.
1993  **Skenostemma** Kloppenburg (here published) Type: **Hoya heuschkeliana** Kloppenburg.
1993  **Rudimentalia** Kloppenburg (here published) Type: **Hoya darwinii** Loher.
1993  **Amblyostemma** Kloppenburg (here published) Type: **Hoya meliflua** (Blanco) Merrill.

V. Names of Genera Placed at the Rank of Section

1848  **Physostelma** (Wight) Blume, in Rumphia 4:32. Type: **Hoya campanulata** Wight. Synonym Cystidianthus (Hasskarl) King (genus placed at the rank of section 1901).
1856  **Otostemma** (Blume) Miquel, in Flora van Nederlandsch Indië 1:525, Type: **Hoya lacunosa** Blume.
1856  **Sperlingia** (Vahl) Miquel, in Flora van Nederlandsch Indië 1:523 Synonym: Acanthostemma Blume. Type: **Hoya verticillata** (Vahl) G. Don.
1856  **Cathetostemma** (Blume) Miquel, in l.c. (as the proceeding one) p.525. Type: *Hoya laurifolia* (Bl.) Decaisne.
1856  **Plocostemma** (Blume) Miquel, in l.c. p.526. Type: *Hoya lasiantha* Korthals.
1883  **Cryptoceras** (Bennett) Hooker f., in Flora of British India p.52. Type: *Hoya multiflora* Blume. A misspelling of *Cyrtoceras* Bennett.
1883  **Pterostelma** (Wight) Hooker f., l.c. p.53, Type: *Hoya acuminata* Wight.

These sections when organized and studied can be an invaluable aid in species identification. Understanding the characteristics governing how and why hoya species fit into each section is a valuable aid in placing a name to a unknown hoya plant. To disregard these sectional characteristics entirely is to fall into the trap of false identifications. As with most classification structures, becoming familiar with them greatly aids in our understanding of species relationships. A note of caution: it does not follow that every species placed in a section by an author actually belongs there. All of us are prone to make misjudgments, misunderstandings and incorrect conclusions (there are quite a number in the literature). Furthermore it may be possible to refine the sections and/or add new ones by closer study. By constant correction and refinement, progress will be made toward better, clearer classification. This will lead to greater understanding of the complexities and beauty within the Genus *Hoya*.

**Note:** Miquel placed *Sperlingia* and *Acanthostemma* Genus (as a synonym) together in a section. In Dec. 1993 after studying the description of *H. verticillata* (Vahl) Miquel it became evident to me that this species was in the Section *Hoya*. Dr. J.F. Veldkamp of the Rijksherbarium in The Netherlands obtained the original publication of the Genus *Sperlingia* along with Vahl’s species descriptions. This confirmed that this genus was based not on bilobed coronal hoya species, but on species in the Section *Hoya*. Subsequently the two species *Sperlingia verticillata* Vahl and *S. opposita* Vahl ((*H. verticillata* (Vahl) Don and *H. opposita* (Vahl) Don)) were determined by Ruurd van Donkelaar (also in The Netherlands) to be *Hoya parasitica* Wall. ex Traill*. The implication then is that all the bilobed species of hoya included by Miquel under the Section are incorrectly placed there. Thus the formation of a new hoya section to house these bilobed species. This new section was created in April 1994 by me and is named *Hoya Section Acanthostemma* (Blume) Kloppenburg. Its type species is *Hoya rumphii* Blume ex Hooker f..

* 12/2001 (DK) I now believe this determination to be incorrect and both species are not identical and neither are *H. parasitica*.

**VI. A Key to the Hoya Sections**
by Dale Kloppenburg

1a. Leaves not paired, circular (shield -shaped) imbricate, one aborts

----------Section **Peltostemma** Schltr..
1b. Leaves paired, opposite,
2a. Corona scale outer lobe below, not sulcate; pentamerous skirt (annulus) and 2 teeth like projections pointing away from the median line
   ...Section Otostemma (Blume) Miquel.
2b. Corona scales sulcate below, no pentamerous skirt,
3a. Flowers small under 1.6 cm. in diameter flattened, natural form much smaller,
4a. Corona scales almost columnar ..........................Section Oreostemma Schltr.
4b. Corona scales otherwise.
   5a. Corona scales outer lobe raised above inner lobe, corolla reflexed, subtended by an inflexed annulus ..........................Section Kloiphora King.
   5b. Corona inner lobe higher than outer lobe, corolla not reflexed, no annulus present,
6a. Corolla urceolate..........................Section Skenostemma Klopp..
6b. Corolla revolute..........................Section Acanthostemma (Bl.) Klopp..
3b. Flowers larger than 1.6 cm. flattened,
7a. Pollinia with rudimentary or no pellucid edge,
8a. Pollinia with no pellucid edge,
   9a. Translators long and twisted, affixed centrally or above to the retinaculum; column long woolly matted............Section Eriostemma Schltr..
   9b. Translators not twisted, narrow, basely affixed to retinaculum, gynostegium sessile..........................Section Cathetostemma (Blume) Miquel.
8b. Short rudimentary edge, pollinia stubby...........Section Rudimentalia Klopp..
7b. Pollinia with well developed pellucid sterile edge.
10a. Corona scales very upright, long inner lobes.
   11a. Prominent beard at base of gynostegium, column long, inner corona apex attenuate, flower mid-size............Section Centrostemma (Decaisne) Hooker.
   11b. Column sessile, bald, inner corona apex 2-fid incurved, hooked, ..........................Section Ancistrostemma Hooker f..
10b. Corona scales otherwise, short inner lobes,
12a. Corona scales outer lobe erect,
13a. Calyx small, lobes 2 mm. long,
   14a. Corolla densely woolly at base, reflexed, coronal outer lobe erect..............Section Plocostelma (Blume) Miquel.
   14b. Corolla not woolly at base, campanulate, coronal outer lobe raised ..........................Section Physostelma (Wight) Blume.
13b. Calyx large, lobes +/- 8 mm. long ..........................
   ..........................Section Pterostelma (Wight) Blume
12b. Corona scales horizontal,
15a. Corolla revolute, coronal outer lobe obtuse, ..........................Section Amblyostemma Kloppenburg
15b. Corolla rotate, corona outer lobe tapering (acute) ..........................Section Hoya
VII. Sections Accepted

I here present the sections in the order in which they appear in the key with an English translation and possible discussion. They are as follows:

Section Peltostemma Schlechter

In Beihefte zum Botanischen Centralblatt 34 (1916) 5.

_Hoya maxima_ (Karst.) Warburg together with _Hoya imbricata_ Decaisne from the Philippines constitute the section, which I here name _Peltostemma_, because of the shield-forming leaves, as well as in the habit (of growth), but also the structure of the blooms which are remarkably characteristic. The apparently dovetailed (imbricate) regular, almost circular, close-fitting leaves, which are fastened to the substrate, are pretty little things and stand upon a pedestal, complete growing leaf pairs, that in their arrangement are closely fitted in such manner, botanically speaking that resemble the _Conchophyllum_ and for sure the _Dischidia_ species of the Section _Collyris_. In the blooms the Section _Peltostemma_ is distinguished through the inclined corona scales and the long extended anther appendages. In addition the stigma head is hollow on the point and slow to open in comparison to the rest of the sections. Type species (designated here) _Hoya maxima_ (Karst) Warburg.

Section Otostemma (Blume) Miquel

Section 4. Otostemma Miquel Flora van Nederlandsch Indië 1:525.

Flowers small white; corolla revolute; corona scales boat shaped, below are two tooth-like processes. Anther apex acute. I add that the most prominent character of this section is the pentamerous skirt which hangs from the base of the outer corona scale lobes and lack of sulcation below. Type species for the section is _Hoya lacunosa_ Blume.

Section Kloiphora King

In Journal of the Royal Asiatic Society, Bengal Branch 2:53.

Corona-processes with lower lobe globose, hollow; upper shorter- curved; corolla-tube with a broad annular ring (corolline corona ?). Type for the section is _Hoya curtisii_ King & Gamble.
Section Skenostemma Kloppenburg


Found in the Philippines with at least two color forms. Type species: Hoya heuschkeliana Kloppenburg, Pancho #2175, CAHP. (see under Sectional descriptions for further delineation’s).

Section Acanthostemma (Bl.) Kloppenburg

In Hoya Section Acanthostemma (Blume) Kloppenburg (1994) 2. The species Hoya rumphi Bl. ex Hooker f..

Description same as for the Genus Acanthostemma Blume in Rumphia 4 (1848) 49-50.

Section Eriostemma Schlechter

In Botanische Jahrbücher 50 (1913) 106 & 135.

Translated from the German 106:

Section VII. Eriostemma the stems and leaves with all surfaces (parts) covered with short soft hairs; in other respects its blooms possess marked sharp characteristics..... The gynostegium stands upon a column which goes down into the crown of the collar of the corolla which is covered with shaggy cottony hairs. The corona scales are comparatively short. The blooms are large or very large with a well developed thickly hirsute calyx. Type species of the Section is H. coronaria Blume.

Translated from 135:

Section VII. Eriostemma Schlechter. I thought it best to present here this distinctive section Eriostemma. This section is so well and sharply different, that one could consider whether or not to regard it as a separate sub-genus. I have so far presented above briefly the main points, but now I wish to present them once again in more detail. In habit there is a strong similarity that can be found with EU-Hoya, but the branches are softer and more fleshy and consistently with more or less soft hairs. The peduncles are extraordinarily thick and soft textured, the calyx as with Pterostemma more strongly structured, and the large hairy blooms are likewise fleshy. The gynostegium with the corona scales stand upon a woolly matted column that is the outgrowth formed of the filaments, which are united with the corona tube. The pollinia are distinguished (marked)
as opposed to the other *Hoya* species by means of the fact that the translators have undergone a strong development and exhibit a twist; also the retinaculum is rather large. The pollinia are more club shaped and moreover do not have the keel on the outer edge, characteristic of other *Hoya* sections.

The number of species belonging to this section is still small, but certainly with the wider search into the Malay-Papua Flora Sphere, many yet belonging here will be added.

For example the most western species *H. coronaria* Blume, is to be considered which comes from the Malayan Peninsula and Sunda Islands, as is known. *H. ariadna* Decaisne is described from the Island of Amboina. Two more unpublished species I know of come from the Philippnes and the Celebes, the others are from Papua. Of the latter are *H. purpurea* Blume and *H. neo-guineensis* Engler from Dutch New Guinea and *H. guppyi* HemsI. as well as *H. affinis* HemsI. come from the English Solomon Islands. In the German parts of Papua, I know of at present the four species mentioned here, namely *H. purpurea* Blume, *H. hollrngii* Warburg, *H. gigas* Schlechter and *H. lauterbachii* K. Schumann. The first of these four species I know from locations in close proximity to the sea coast, but they also go further inland into the forests of the hills, to about 300 meters altitude. The other three species remaining of the section are inhabitants of the hill forests, and are likewise terrestrial growers, but with their vines often enveloping whole bushes and small trees. In particular they are found along stream and forest edges.

**Section Cathetostemma (Blume) Miquel**

Section V. Cathetostemma in Miquel, Flora van Nederlandsch Indië, 1 (1856) 525.

Translation:

Flowers midsize, yellowish green, corolla lobes reflexed, corona scales sickle-shaped, convex, 2 parted at the base, stigma dome-shaped. Type for the section is *Hoya laurifolia* (Bl.) Decaisne.

**Section Centrostemma (Blume) Hooker**

Section 1: in Flora of British India 4 (1883) 52.

**Note:** This section was named by J. D. Hooker Section Cryptoceras, evidently a misspelling of Bennett's Cyrtoceras. This is based on a genera which is a heterotypic synonym of the Genus Centrostemma. In addition to these two errors the status of this species (or group of species) as being in the Genus Hoya is in question.
Corolla reflexed, lobes longer than broad, column stipitate; coronal-processes very long, erect, with a long spur diverging from the base of each. Type for the section is *Hoya multiflora* Blume.

**Section Rudimentalia Kloppenburg**

*Sect. nova.* Umbellae multiformae, flores glabrae magnae glaberrimae nitidae, corolla profunde lobata tubo perbrevi; lobi cordato-ovati, reflexi. Coronae foliola erecte, triquetro-conicae, magna, subtus usque ad basin sulcatae, pollinia subcompressa in glandulo rhomboideo fere sessile, sterlis margin brevis vel rudimentalis. Pollinia with rudimentary pellucid steril margin (between full edged and none).

Type species for the section is *H. darwinii* Loher.

**Section Ancistrostemma Hooker**

In Flora of British India 4 (1883) 53. In English:

Corolla reflexed, lobes longer than broad. Column sessile; coronal-processes gibbous and 2-lamellate below, produced upwards into long erect points, each with a 2-fid incurved hooked tip. Type species is *Hoya edeni* King ex Hooker.

**Section Pterostelma (Wight) Hooker**

Hooker, J. D. in Flora of British India 4 (1883) 53.

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 Blume.

Type species is *Hoya acuminata* Hooker f.

**Note:** Hooker has placed this with Blume's Genus Plocostemma. The sections, however, are based on different type species. In addition the two descriptions are different. As pointed out by Dr. R. Schlechter they differ in their calyx. I feel this alliance is incorrect.

Translated from Schlechter in Botanische Jahrbücher 50 (1913) 124-125.

Section IV *Pterostelma* (Wight) Hooker, distinguished through the corona scales that are deeply (strongly) bent upwards, and whose outer parts stand rather erect (straight up), opposed to this the forward extremity stretches up to the anther apex. The blooms are like the previous section, (Plocostemma) rather conspicuous with open corolla, only the calyx is different, the segments in this section are larger throughout. Type of the section is for the Western species, *H. acuminata* Hooker f. (*Pterostelma acuminata* Wight), for the
Eastern species *H. albiflorum* Zipp. (*Pterostelma albiflorum* Blume). Type is *Hoya acuminata* Wight.


**Section Physostelma (R. Wight) Blume**

Blume in *Rumphia* 4 (1848) 32 (as Physostemma).

The leaflets of the staminal corona somewhat inflated, with revolute margins, below with a gaping longitudinal fissure.

From Schlechter’s German in *Botanische Jahrbücher* 50(1913) 105.

Section VI. **Physostelma** (Wight) Bl. contains the species with the broad bell shaped corolla, and a corona which reminds one of *Eu-Hoya*, which is rarely somewhat compressed laterally. Perhaps subsequently two sections will be needed here, in which case a section named for the species with the laterally compressed corona lobes, as seen from above, will be needed. Viewed from above the corona looks small, the calyx is always small. The blooms are rather large, at times very large. Type species of the section is *H. campanulata* Blume.


**Section Oreostemma Schlechter**

In *Botanische Jahrbücher* 50 (1913) 106.

Translated from the German:

Section V. **Oreostemma** is at the present the only one known to me by the species here described, which is hereby distinguished through the almost cylindrical fleshy corona scales with the outer parts almost completely bent perpendicularly (vertically) upwards, so that the forward as well as the other end falls off abruptly to the anther (extremity) apex. The blooms are midsized (medium large) with small calyx, the corolla, bent back strongly. Type species of the section is *H. oreostemma* Schlechter.
Section Plocostemma (Blume) Miquel

In Miquel Flora van Nederlandsch Indië 1 (1857) 526.

Section 6. Corolla somewhat large, with hairy-tomentum near the throat and at the base of the flap hairy-tomentose, corona scales erect, pleated below; stigma apiculate. Leaves often slender, fleshy, and membranaceous when dry. Type species is Hoya lasiantha (Bl.) Korthals.

Translated from Schlechter's German in Botanische Jahrbücher 50 (1913) 105.

Section III. Plocostemma (Blume) Miq. containing only a few species with strongly open corollas and large upright, laterally compressed corona scales, with the forward extremity stretched upward to the anther extremity. The blooms are rather large and pretty to look at, the calyx is small. Type of the section is H. lasiantha (Blume) Koth. (Plocostelma lasianthum Blume).

Section Amblyostemma Kloppenburg

Sect. nova. Folia crasso-carnosa utrique glabra, marginibus reflexa, pedunculi breves petiolo breviore, corolla cum lobis revolutis, extus glabra, intus papillisa. Coronae lobi crasso-carnosi dorso canaliculati, supra concavo-excavati cum tuberoello parvo in cavitate; subtus sulcatis, stigmate apiculata, flores magma. Type species: Hoya meliflua (Blanco) Merrill.

Section Hoya

In G. Don, General System of Gardening and Botany 4 (1837) 125. Twining, scandent, or decumbent shrubs, usually radicant. Leaves fleshy. Leaflets of the corona furrowed beneath. Type species is Hoya carnosa R. Br.

VIII. Salient Features of the Hoya Sections

There have been some additions by various taxonomists to the original sectional descriptions. Now as they appear in the "accepted list" I will proceed to discuss these sections and point out the salient characters:

Peltostemma Schlechter. Pelto = a shield and stemma = crown. A shield crowned hoya. This section was established to cover a small group of hoyas in which one leaf of a pair aborts or otherwise fails to develop. The leaves are circular convex on top with the
concave surface covering the stem and appressed to the substrate (usually tree trunks). Many rootlets develop from under these leaves attaching to the substrate, and often the spaces are occupied by small ants. The corona scales are very upright with long emerging anther appendages extending from the flower center, rising above the scale's inner lobe. The anther wings are prominent. The pollinia are rather long and narrow, and the translators broad and scapulate with the caudicles long and narrow as is also the retinaculum. The delineating features are thus:

1. One circular shield-like leaf per node
2. Leaves appressed to the substrate
3. Leaves tend to be imbricate
4. Coronal scales upright
5. Anther appendage very long and narrow, extended
6. Anther wings prominent
7. Styler head hollow at apex
8. Translators broad, scapulate
9. Pollinia, caudicles and retinacula long and narrow

**Otostemma** (Blume) Miquel, *oto* = ear and *stemma* = crown (The Ear Crowned Hoya). There is little dispute regarding this section since its characteristics are well delineated and up till now very few species have been discovered with the sectional characteristics. The flowers are small with revolute very pubescent corollas. *Hoya lacunosa* Blume is the type species. From the lower surface of the coronal scale project two dentate structures, but even more striking is the pentagonal skirt or annulus extending below with each corner being below the anther wing area. It is continuous (in *H. lacunosa*) except for a visible short slit at the intersecting corners. In the Borneo species the corners are rounded slightly and slightly spread like bifold tongues. Another species from Borneo sold in commerce, as *H. sp. F-484*, is somewhat intermediate but with a very distinctive pollinarium. There has been speculation recently about the 2 acute dentate structures on the ventral side of the thin coronal scales outer coronal lobe. These structures are clearly visible in my photomicrograph of *Hoya lacunosa* Blume they were drawn as two adjacent triangles in Blume's figure. The thickening of the central portion of the lower surface of the outer lobe spreads outward to form the tooth. There are species that evidently belong in this section from Borneo that do not possess these teeth. I feel this character should be removed from the sectional traits so as to include these Bornean species. It is the column that extends the gynostegium and not the skirt that surrounds it. These teeth should not be confused with the bilobed extensions in the Section Acanthostemma (Bl.) Kloppenburg.

1. Gynostegium elevated
2. Flowers small
3. Corolla rotate, revolute
4. Corona scales boat shaped, fleshy thin translucent on outer edges
5. Corona scales diverticulate
6. Corona scales concave above
7. Corona scales interior angle toothed, superior or equal to the
8. Corona scales below with bidentate appendage and annulus, not sulcate
9. Stigma (styler head) rudimentary, apiculate *
10. Leaves glabrous
11. Umbels with moderately long peduncles

* Stigma (styler head) on H. obscura Elmer ex Burton has a columnar base (slightly tapering upward) with a triangular mealy head.

Kloiphora King. Cloe = a collar and phoro = to bear. A collar bearing hoya. Again this is a monotypic Section consisting at present of only H. curtisii King & Gamble, from Malaya, designated as Section at its conception. Sectional characters:
1. Corolla tube with a broad annular ring
2. Corona scales lower lobe globose
3. Corona scales lower lobe hollow
4. Corona scales upper lobe short curved

Specific characters could be added from the species, however doing so may narrow the diagnosis too greatly.

Skenostemma Kloppenburg. Skene = covered place and stemma = crown. The covered crown Hoya. Containing at present only one species. A branching small epiphyte with urceolate flowers on short peduncles and pedicels, almost sessile. The corolla lobes are reflexed, with the corolla 5-fid cut to above the middle. The crown is upright and with bifid outer lobes as in the Section Sperlingia (Vahl) Miquel (Acanthostemma). The pollinarium have winged translator arms. The translators are attached low down on the retinaculum. The stigma (styler head) is columnar with a nipple-like apex. Key features are:
1. Crown covered by corolla (corolla urceolate)
2. Flowers small
3. Peduncles and pedicels very short almost sessile
4. Corona upright
5. Corona scales bilobed as in Acanthostemma
6. Translator arms winged, attached low down on retinaculum
7. Stigma head (style) columnar apex nipple-like

Acanthostemma (Bl.) Kloppenburg. Acanthus = a thorn and stemma = crown. Thorny crowned hoya. This section has small pubescent ball shaped flowers with (revolute corolla) flowers looking much like those of the Section Otostemma. Most have geotropic umbels which are concave or flat. The calyx is small, the gynostegium short adnate. The apex of the corolla lobes are bare and hidden in the revolute fold, difficult to discern in herbarium material. The corona is upright to very upright, with a tooth-like inner apex and blunt outer apex, the lateral sides of the scales are shelved and extended beyond and often above the outer apex as two ligule-like structures, the lower part of the scale is sulcate
recurved to form a groove. The pollinia have curved translator arms supporting clear caudicles (described as winged). The pollinia are affixed at the base and have a pellucid outer border but not all the way to the caudicles. The styler head (stigma) is apiculate. Sectional characteristics are:

1. Flowers small
2. Corolla rotate, revolute
3. Gynostegium short, adnate
4. Corona segments fleshy, erect
5. Coronal inner angle tooth-like
6. Coronal outer angle with 2 extensions
7. Stigma (styler head) apiculate
9. Flowers often many

The Eriostemma section has now been transferred to Genus status (Eriostemma Kloppenburg & Gilding) 2001.

Eriostemma Schlechter. *Erio* = wool and *stemma* = crown. A woolly crowned hoya. This section is so distinctive and has so many sharp differences from other hoya that it has been proposed to make it into a subgenus of Hoya (Schlechter) or even a distinct genus in its own right (Dr. Ken Hill). With this in mind the diagnostic features are as follows:

1. Stems and leaves with soft short hairs
2. Gynostegium stands on a column
3. Column covered with shaggy cotton-like hairs
4. Corolla with distinct collar
5. Large flowers
6. Thick hirsute calyx
7. Branches soft and fleshy
8. Peduncles extraordinarily thick and soft
9. Flowers hairy and fleshy
10. Pollinia club shaped with no pellucid border
11. Translator arms long, twisted
12. Retinaculum large

Cathetostemma (Blume) Miquel, from *cathetos* = perpendicular and *stemma* = crown. Perpendicular crowned hoya. The drawing in Museum Botanicum Lugduno-Batavum I (1849) 59 tab.13 shows a very upright crown with a bifid outer apex. The pollinia are ellipsoidal and do not show the distinct pellucid margin (sterile keel). They are similar in appearance to those of Section Eriostemma Schlechter. It definitely does not have a long narrow pellucid edged pollinia as in Section Centrostemma (Bl) Hooker. Pollinia are basely attached to the retinaculum by translators, whereas those in Section Centrostemma are laterally attached. No species of the Centrostemma I have examined has this type of
pollinarium. The calyx depicted here is very small in relation to the corolla or crown. Sectional characteristics are:

1. Corolla reflexed
2. Gynostegium short
3. Corona scales sickle shaped
4. Corona scales erect, fleshy; convex
5. Corona scales at base bifid
6. Stigma (styler head) umbonate
7. Leaves glabrous, leathery
8. Umbels of many flowers
9. Peduncle short
10. Pedicels long
11. Flowers often very large (yellowish)
12. Pollinia basely attached

Rudimentalia Kloppenburg *rudimentum* = a beginning (transitional pollinia type, rudimentary). Glabrous leaved hoyas, sometimes dimorphic or effected by formic acid from ants, with many flowered umbels, flowers large, glabrous, shiny, corollas deeply cut, tubes short, lobes reflexed; corona leaflets erect, large triangular conic, on the lower surface deeply sulcate; pollinia compressed, short ovate, sterile pellucid margin rudimentary, almost lacking, retinaculum large broad, translators cone shaped, staminal head obconic.

1. Leaves fleshy, glabrous
2. Foliage often modified (formic acid)
3. Flowers large, many
4. Corolla deeply lobed, reflexed
5. Tube short
6. Corona erect, large
7. Corona deeply sulcate below
8. Pollinia broad, ovate
9. Sterile (pellucid) edge rudimentary
10. Retinaculum short broad, prominent
11. Styler head obconic

Centrostemma (Decaisne) Hooker f.. *cento* = a point and *stemma* = crown (a pointed crown) *Hoya multiflora* Blume the Type is such a distinctive species that one should have no difficulty placing species into this section. It is so distinct that some taxonomists have felt it should be a genus in its own right and thus not be incorporated into the Genus *Hoya* R. Brown. Note: J. D. Hooker in his "Flora of British India" apparently misspelled Bennett's Cyrtoceras *cyro* = arched *cerae* (cer) = a horn (arched horn) as Cryptoceras while placing it as a hoya section. Sectional characteristics:
<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Corolla rotate, reflexed</td>
</tr>
<tr>
<td>2.</td>
<td>Gynostegium with prominent beard about base</td>
</tr>
<tr>
<td>3.</td>
<td>Gynostegium elongated</td>
</tr>
<tr>
<td>4.</td>
<td>Corolla inner lobes overtopping gynostegium</td>
</tr>
<tr>
<td>5.</td>
<td>Coronal scales fleshy, erect</td>
</tr>
<tr>
<td>6.</td>
<td>Coronal scales at base horn-like or with apex tooth-like</td>
</tr>
<tr>
<td>7.</td>
<td>Leaves glabrous, leathery</td>
</tr>
<tr>
<td>8.</td>
<td>Peduncles short</td>
</tr>
<tr>
<td>9.</td>
<td>Umbels, many flowered &amp; often large on long pedicels</td>
</tr>
<tr>
<td>10.</td>
<td>Stigma (styler head) dome shaped</td>
</tr>
</tbody>
</table>

**Ancistrostemma** Hooker, *Ancistro* = a fish hook and *stemma* = crown. Hook-crowned hoya. To date only one hoya species falls into this section (H. edeni King). The name was created as a sectional designation and not first as a genus as with many of the other sections. Sectional characteristics are:

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Corolla reflexed</td>
</tr>
<tr>
<td>2.</td>
<td>Corolla lobes longer than broad</td>
</tr>
<tr>
<td>3.</td>
<td>Column sessile</td>
</tr>
<tr>
<td>4.</td>
<td>Corona gibbous</td>
</tr>
<tr>
<td>5.</td>
<td>Coronal scales below 2 lamellate</td>
</tr>
<tr>
<td>6.</td>
<td>Coronal scales inner lobe extended upward, erect</td>
</tr>
<tr>
<td>7.</td>
<td>Corona inner lobe bifid, incurved, hooked</td>
</tr>
</tbody>
</table>

**Pterostelma** (Wight) Hooker. *Ptero* = winged and *stelma* = crown "winged crown" (leafletls of corona membranaceous). Both Blume in Rumphia 4 (1848) 32 and Wight's description say "corolla rotate" with no mention of the corolla being reflexed, and the same holds true for the Type description of *Hoya acuminata* Benth., however, by the time J. D. Hooker in the Flora of British India 4 (1885) 53 describes the *Pterostelma* section he adds "corolla reflexa". This is true of the section *Plocostemma* but should not be in this sectional description. ((The coronal scales (foliola) are reflexed but not the corolla)). Both the drawing of *Pterostelma albiflorum* (Rumphia tab.188) and Schlechter's drawing of *Hoya calycina* show the calyx lobes as large and in *H. calycina* also pubescent. (neither of these species have reflexed corolla). The distinguishing features are thus:

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Corolla rotate</td>
</tr>
<tr>
<td>2.</td>
<td>Corolla lobes longer than broad, linear-lanceolate</td>
</tr>
<tr>
<td>3.</td>
<td>Corolla tube pilose</td>
</tr>
<tr>
<td>4.</td>
<td>Corona scales membranaceous</td>
</tr>
<tr>
<td>5.</td>
<td>Corona scales, sides reflexed</td>
</tr>
<tr>
<td>6.</td>
<td>Corona subulate erect (folded in the middle like a butterfly's wings)*</td>
</tr>
<tr>
<td>7.</td>
<td>Corona scales broad</td>
</tr>
</tbody>
</table>

*(The coronal scales (foliola) are reflexed but not the corolla)*
8. Dorsal not lateral attachment of the pollen masses to the retinaculum (corpusculum)
9. Sepals of the calyx large
10. Stigma (styler head) apiculate
11. Flowers conspicuous (large)
12. Pedicels equal
13. Coronal scales ovate
14. Caudicles (translators) unwinged
15. Mesophyll differentiated

Note: characters 12-15 are from Dr. K.D. Hill’s additional observations.

* See Schlechter’s drawing of H. calycina on p.65 (from the Berlin type sheet) in Hoyas of Northeastern New Guinea 1992 - ORCA Pub. Co.. This shows the folding of the corona and other details. It is clear also, as Dr. Hill stated that the H. australis complex belong here. In Rumphia 4 (1848) 33 Blume placed Hoya albiflora Herb. Zipp. as Pterostelma Wight; P. (Rhytistelma) alibiflorum, thus in a section (non Hoya) Rhytistelma. Fig. 88 shows a hoya with rotate corolla but with no flowers showing reflexed corolla, most possibly still in the process of opening.

Physostelma (Wight) Blume, from Physa = a bladder and stelma = a crown (leaflets of crown inflated). This can be combined with the section Cystidianthus (Hasskarl) King & Gamble (1843). The umbels of few large flowers are borne on long peduncles. Under section Cystidianthus we find the additional key character (not mentioned in Physostelma Wight) "corolla somewhat campanulate" and that the corolla margins are undulate; "at first spreading then reflexed". Wight says "stigma convex and blunt". Schlechter emphasizes the "bell shaped" corolla and that 2 sections might be needed to separate the broad coromal types from those whose coromal lobes are laterally compressed. (e.g. H. epedunculata Schlechter from H. campanulata Blume). Blume's Physostemma also seems to belong here. He says coromal scales "sub inflated" and that the margins are revolute with a gaping longitudinal fissure (sulcation). In summary the salient features are: (W=Wight, S=Schlechter, H=Hasskarl, B=Blume, K=Hill).

W Corolla margins rotate later reflexed
W Bladder-like corona (inflated)
W Large flowers
W Few flowers
W Long peduncles
W Flattened Stigma (styler head) somewhat sunken in center
HS Bell shaped campanulate corolla
S Calyx small
S Corona small in relation to corolla
H Exterior angle of corona scales rising
B Corona with gaping longitudinal fissure below
12. K Pedicels equal
13. K Caudicles (translators) unwinged
14. K Mesophyll strongly differentiated

**Oreostemma** Schlechter. *Oreo* = a mountain and *stemma* = crown. A mountain crowned hoya. A section originated by Dr. Schlechter as such and not first as a genus. Its type species is *H. oreostemma* Schlechter. Dr. Schlechter felt it might possibly fit in the Pterostelma section but for the very small calyx and the fact that the outer lobe of the coronal scales stand up vertically (almost columnar) and the inner ones taper off in a line almost perpendicular to the tip. Thus the sectional characteristics are:

1. Calyx very small
2. Corona scales almost columnar
3. Corona scales outer lobe stand up vertically
4. Corona scale inner lobe tapering to a thin line almost perpendicular at tip
5. Corona scale inner lobe ca. 1/2 as high as body
6. Corolla strongly reflexed

**Plocostemma** (Blume) Miquel, from *placo* = a bladder and *stemma* = crown. Bladder-crowned Hoya. Dr. Schlechter's *H. piestolepis* and *H. hypolasia* were both placed in this Section. They seem to belong here based on the coronal scale formation and the recurved corollas. Dr. Schlechter, however, has not drawn the stigmas so we do not know if these two species have the distinctive apiculate stigmas mentioned and also depicted in Mus. Bot. Lugd.-Bat. 1:60 fig.14. (*Pl. lasianthum* Bl.). This drawing, if accurate, also depicts a very distinctive prominent attachment of the pollinia to the translators. Burton in Hoya 13 (1991) 28 states "*H. cumingiana* Decne." is a Plocostemma. This species does not fit the Sectional characteristics in a number of key respects. Its coronal lobes are entirely different in shape, not laterally compressed, but rather broad in the middle, and not overly upright. The corolla is not densely woolly. The translators are very small at the attachment point. Most of all, however, *H. cumingiana* Deccaisne has a very distinctive ornate capitate head to the styler (stigma) head. I feel it more nearly belongs in Section Cathetostemma (Bl.) Miquel. The Sectional characteristics:

1. Corolla densely woolly esp. near base
2. Corolla spread or reflexed
3. Corona upright
4. Coronal scales fleshy, inner apex tooth-like
5. Coronal scales laterally compressed
6. Gynostegia adnate, somewhat sessile
7. Coronal scales below folded upon self
8. Calyx small
9. Many flowered
10. Stigma apiculate

---

25
**Amblyostemma** Kloppenburg from *amblyo* = blunt and *stelma* = crown. The blunt crowned hoya.

Very vigorous growth, large glabrous foliage with revolute edges to the leaves. Short glabrous peduncles and pedicels. Flowers medium large, many per umbel. Corolla glabrous outside densely puberulous inside with revolute lobes. Crown with short blunt outer apices, scales above concave with an umbo; exuding a colored honeydew which stains the pubescence of the corolla. Staminal column very short, staminal head apiculate.

Sectional characteristics:

1. Large glabrous foliage
2. Leaf edges revolute
3. Flower size medium large
4. Many flowers per umbel
5. Corolla revolute, inside densely pubescent
6. Outer corona lobes blunt
7. Scales above concave with umbo
8. Exuding a colored honeydew
9. Styler head apiculate

**Hoya:** the original descriptions are very brief, so with few clear characteristics, the section has become the "dumping ground" for many hoya species. Further sections should be added to more clearly distinguish those species in this "dumping ground". Sectional characteristics:

1. Leaves fleshy
2. Corona furrowed below (sulcate or channeled)
3. Staminal corona approximating horizontal
4. Flowers large
5. Corona scales flat above or slightly cupped
6. Corona scales, outer end acute
7. Calyx small
8. Pedicels equal
9. Corona with slight median ridge
10. Caudicles (translators) unwinged
11. Mesophyll weakly differentiated or undifferentiated.

*Note:* characters 9-11 are from Dr. K.D. Hill's additional characters. I have added 3-7.

**IX. Some Representative Species From Each Section**

Section *Peltostemma* Schlechter:
H. imbricata Decaisne
H. maxima (Karsten) Koorders
H. pseudomaxima Koorders

Section **Otostemma** (Blume) Miquel
H. lacunosa Blume
H. obscura Elmer ex Burton
H. brittonii Kloppenburg

Section **Skenostemma** Kloppenburg
H. heuschkeliana Klopp.

Section **Kloiphora** King
H. curtisii King

Section **Acanthostemma** (Blume) Kloppenburg
H. bilobata Schlechter
H. burtoniae Kloppenburg
H. gracilis Schlechter
H. gigantanganensis Kloppenburg
H. hasseltii Miquel
H. inconspicua Hemsley
H. kuhlii Koorders
H. leytensis Elmer ex Burton
H. littoralis Schlechter
H. loheri Kloppenburg
H. tsangii Burton ex Kloppenburg
H. flavida Forster & Liddle
H. micrantha Hooker f.
H. microstemma Schlechter
H. panchoi Kloppenburg
H. pieta Miquel
H. plicata King & Gamble
H. pruinoso Miquel
H. pruina Blume
H. quisumbingii Kloppenburg
H. revoluta Wight
H. rizaliana Kloppenburg
H. rumphii Blume

Section **Eriostemma** Schlechter Now Eriostemma species,
H. coronaria Blume
H. ariadna Decaisne
H. madulidii Kloppenburg
H. ciliata Elmer ex Burton
H. purpurea Blume
H. neoguineensis Engler
H. subcalva Burkill
H. guppyi Oliver
H. affinis Hemsley
H. hollrungii Warburg
H. gigas Schlechter
H. lauterbachii K. Schumann
H. sussuela (Rox.) Merr.

Section **Cathetostemma** (Blume) Miquel
H. laurifolia Decaisne

Section **Rudimantalia** Kloppenburg
H. darwinii Loher  
H. mitrata Kerr  

Section **Centrostemma** (Blume) Miqel  
H. multiflora Blume  
H. laurifolia Blume ?  
H. platipetala Merrill ?  

Section **Ancistrostemma** Hooker f.  
H. edeni King  

Section **Pterostelma** (Wight) Hooker f.  
H. acuminata Wight non Hooker  
H. albiflora Zipp. ex Blume  
H. calycina Schlechter  
H. australis R. Brown ex Trail  
H. magnifica Forster & Liddle  

Section **Physostelma** (Wight) Blume  
H. colletti Schlechter  
H. campanulata Decaisne  
H. cystiantha Schlechter  
H. betchei Schlechter  
H. patella Schlechter  
H. megalaster Warburg  
H. microphylla Schlechter  
H. venusta Schlechter  
H. pulchella Schlechter  

Section **Oreostemma** Schlechter  
H. oreostemma Schlechter  
H. poolei White & Francis  
H. alata Hill  

Section **Plocostemma** (Blume) Miqel  
H. lasiantha Korthals  
H. blumeana Schlechter (P. pallidum Blume)  
H. piestolepis Schlechter  
H. hypolasia Schlechter  

Section **Amblyostemma** Kloppenburg  
H. meliflua (Blanco) Merrill  
H. diversifolia Blume
H. kerrii Craib
H. obovata Decaisne
H. excavata Teijsm. & Binn.

Section **Hoya**
- H. carnosa R. Brown
- H. pubicalyx Merrill

**X. A chronology as to the Sectional Uses by Different Authors follows:**

<table>
<thead>
<tr>
<th>Year</th>
<th>Source</th>
<th>Page(s) with description</th>
</tr>
</thead>
</table>
| 1837   | General System of Gardening and Botany 4 s.23 (A) G. Don               | 1. Hoya verae p.125 with description  
|        |                                                                       | 2. not designated p.127 with description |
| 1838   | Genera Plantarum (1836-1844) pub. 1841 Endlicher                      | 1. Hoyae verae p.596 with description H. carnosa  
|        |                                                                       | 2. Wattahaka * p.596 with description |
| 1844   | Decandolle, Prodromus Syst. Veg. 8 Decaisne                            | 1. Hoyae verae p.634 with description  
|        |                                                                       | 2. not designated p.639 with description  
|        |                                                                       | 3. Wattahaka p.639 with description |
| 1848   | Rumphia 4 C.L. Blume                                                  | 1. Hoyae verae p.30 Hoyae carnosae, described  
|        |                                                                       | 2. Physostemma p.32 * described |
| 1849   | Museum Botanicum Lugduno-Batavum 1 C.L. Blume                         | 1. Hoyae verae p.43 no description  
|        |                                                                       | 2. Physostemma p.44 no description |
| 1857   | Flora von Nederlandsch Indië 1 Miquel                                | 1. Euhoya p.516 with description  
|        |                                                                       | 2. Physostemma Bl. p.521 with description  
|        |                                                                       | 3. Sperlengia Vahl p.523 (Acanthostemma Bl.), described |
|        |                                                                       | 4. Otostemma p.525 with description  
|        |                                                                       | 5. Cathetostemma p.525 with description  
|        |                                                                       | 6. Plocostemma p.526 with description |
| 1885   | Flora of British India 4 J. D. Hooker                                | 1. Cryptoceras p.52 described  
|        |                                                                       | 2. Pterostelma p.53 described  
|        |                                                                       | 3. Ancistrostemma p.53 described |
4.  Euhoya p.53 described

1895  De Naturl. Pflantzenfamilien 4 (Engler's) K. Schumann
1.  Cyrtoceras p.289 described
2.  Ancistrostemma p.289 described
3.  Pterostemma p.289 described
4.  Euhoya p.289 described

*Now considered Dregia Meyer nom. cons. or by some Wattakaka Hassk. by others.

1901  Flora of the Malay Peninsula 2  King & Gamble
1.  Cyrtoceras p.559 described
2.  Pterostelma p.559 described
3.  Kloiphora p.559 described
4.  Euhoya p.559 described
5.  Cystidianthus p.561 described

1912  Exkursions Flora von Java 3 S.H. Koorders
1.  Cyrtoceras p.96 described in key
2.  Euhoya p.97 described in key
3.  Acanthostemma p.98 subsection in key *
4.  Ancistrostemma p.100 described in key

* Koorders lists this as a untersection (subsection) designated by Miquel in Fl. Ned. Ind., however, Miquel has only placed this in a section (#3) into synonymy with Sperlingia, and not as a subsection. In addition Koorders quotes this on p.525, however, it is on p.523.

1913  Botanische Jahrbücher 50 R. Schlechter
1.  Otostemma p.105 described
2.  Euhoya p.105 described
3.  Plocostemma p.105 described
4.  Pterostelma p.105 described
5.  Oreostemma p.105 described
6.  Physostelma p.105 described
7.  Eriostemma p.106 described

1988  Telopea 3 (2) K. Hill
1.  Hoya p.244 described
2.  Physostelma p.224 described
3.  Otostemma p.246 described
4.  Pterostemmat p.246 described

1994  Hoya Section Acanthostemma (Blume) Kloppenburg (1994)
1.  Acanthostemma p.2 described
Appendix:

Article 22.1 The name of any subdivision of a genus that includes the type of the adopted, legitimate name of the genus to which it is assigned is to repeat that generic name unaltered as its epithet, but not followed by the authors name (see Art.46). Such names are termed autonyms (Art.6.8; Art.7.2) and must include the type of the adopted name of the genus (i.e. H. carnos R. Br.). Dr. Blume in Rumphia 4 (1848), 30 in conjunction with Section 1. Hoyae verae used Hoyae carnosae (Hoya carnos R. Br.). The section becomes Hoya (repeating the generic name unaltered) and becomes an "autonym".

Article 32.6 Autonyms (Art.6.8) are accepted as validly published names, dating from the publication in which they were established (see Art.19.4, 22.2, 26.2) whether or not they appear in print in that publication.

Note Article 6.8 Autonyms are such names as can be established automatically under Art.19.4, 22.2 and 22.6, whether they were formally created or not. (Section Hoya was not automatically created).

Article 22.2 The first valid publication of a name of a subdivision of a genus that does not include the type of the adopted, legitimate name of the genus automatically establishes the corresponding autonym.

XI. Chronology of Genera Use

Note: Below I have selected the uses of the Generic names, most of which have been incorporated into Genus Hoya R. Br. as sections. I do this only to show the sequence of events leading to the formation of the Hoya Sections. Chronologically they are as follows:

1810 Skrivter af Naturhistorie-Gelskabet. 6:113-114 Vahl
   1. Sperlingia

1834 Contributions to the Botany of India Robert Wight
   1. Physostelma Wight p.39
   2. Pterostelma Wight p.39

1837 General System of Gardening and Botany V.4 s.23 (A) G. Don
   1. Hoya R. Brown p.125
   2. Physostelma Wight p.128
   3. Pterostelma Wight p.128

1838 Genera Plantarum Endlicher
   1. Hoya R. Brown p.595
   2. Pterostemma Wight p.596
3. Physostelma Wight p.596

1843 Tijdschrift von Natur. Geschieden V.10 Hoev. & De Vriese
1. Cystidianthus Hasskarl p.125

1844 DeCandolle, Prodromus Syst. Veg.V.8 Decaisne
1. Plocostemma Blume p.630
2. Physostelma Wight p.633
3. Pterostelma Wight p.633
4. Centrostemma Decne. p.634
5. Hoya R. Br. p.634

1848 Rumphia V.4 C.L. Blume
1. Acanthostemma Blume p.29
2. Otostemma Blume p.30
3. Cathetostemma Blume p.30
4. Pterostelma Wight p.32

1849 Museum Botanicum Lugduno-Batavum V.1 C.L. Blume
1. Hoya R. Brown p.43
2. Centrostemma Decaisne p.57
3. Cathetostemma Blume p.45
4. Cystidianthus Hassk. p.57
5. Plocostemma Blume p.59

1852 Annales Botanices Systematicae V.3 G.C. Walpers
1. Acanthostemma Blume p.64
2. Cathetostemma Blume p.64-65
3. Otostemma Blume p.65
4. Hoya R. Brown p.65
5. Plocostemma Blume p.67

1857 Flora van Indiaë V.2 F.A.W. Miquel
1. Cystidianthus Hassk. p.515
2. Hoya R. Brown p.516

1858 Botanical Magazine, Curtis's
1. Plocostemma Blume t.5081

1858 Annales Botanices Systematicae V.5 C.G. Walpers
1. Physostelma Wight p.505
2. Hoya R. Brown p.505

1860 Botanical Magazine, Curtis's

32
1. Centrostemma Decaisne t.5173

1876 Genera Plantarum V.2 Bentham & Hooker
1. Acanthostemma Blume p.772
2. Otostemma Blume p.772
3. Cathetostemma Blume p.772
4. Plocostemma Blume p.772
5. Cyrtoceras Bennett p.772
6. Centrostemma Decaisne p.772
7. Pterostelma Wight p.772
8. Physostelma Wight p.772

1885 Flora of British India V.4 J. D. Hooker
1. Hoya R. Brown p.52
2. Physostelma Wight p.62

1895 De Naturl. Pflantzenfamilien V.4 (Engler's) K. Schumann
1. Physostelma Wight p.289
2. Truetleria Hooker p.289
3. Hoya R. Brown (Sperlingia Vahl) p.289

1910 Systematisches Verzeichnis Java Koorders
1. Physostelma Wight p.5
2. Hoya R. Br. p.5

1912 Exkursionsflora, Flora Java V.3 S.H. Koorders
1. Physostelma Wight p.96
2. Hoya R. Br. p.96

1965 Flora of Java V.2 Backer
1. Physostelma Wight p.265

* It should be noted that Blume in Rumphia 4 (1844) originally retained the spelling of Pterostelma but changed Physostelma when designating it as a Hoya Section to "Physostemma" p.32.

XII. Hoya R. Brown:
Chronology of literature references

The following publications, here arranged in chronological order, carry descriptions of Hoya.

1810 R. Brown Prodromus "Florae Novae Hollandiae" 459
1811 W. Aiton Hortus Kewensis ed. alt. 2 :84
1826 C. Blume Bijtdagen tot de Flora van Nederlandsch Indië (Bijdr. 1825)1062
1834 R. Wight Contributions to the Botany of India 29
1837 Curtis's Botanical Magazine t.3425
1838 G. Don General System of Gardening and Botany 4 s.23 (A),125
1839 Lindley in Edwards' Botanical Register 18
1844 Decaisne in DeCandolle Prodromus Syst. Veg. 8:634
1845 M. Blanco Flora de Filipinas ed.2,142
1848 Curtis's Botanical Magazine t.4347, 4397
1848 C. Blume Rumphia 4 :29
1848 Fleur des Serres Ser. I. 4:310, 393, 399; 6: 579
1849 Paxton's Magazine 15:243
1849 C. Blume Museum Botanicum Lugduno-Batavum 1:43
1850 Fleur des Series 6:143; 8:12
1857 Miquel Flora van Nederlandsch Indië. 1:516
1858 Curtis's Botanical Magazine t.5081, 5148
1860 Curtis's Botanical Magazine t.5173
1869 G. Bentham Flora Australiensis 4:324
1876 Bentham & Hooker Genera Plantarum 2:775-6
1882 C. Lauerssen Handbook der Systematic Botany 1066
1883 Hooker f. Flora of British India 4:52
1883 F. M. Bailey Synopsis of the Queensland Flora 319
1891 O. Kurtz Revisio Genera Plantarum pt. 2
1895 K. Schumann in Engler De Naturl. Pflantzenfamilien 4:288-289
1895 H. Trimen Handbook of the Flora of Ceylon 2 pt.3:162
1900 F. M. Bailey Queensland Flora pt.3:1012
1901 K. Schumann & K. Lauterbach Die Flora der Deutschen Schutzegebiete in der Südsee 512
1901 G. King & J. S. Gamble Flora of the Malay Peninsula 2:559
1905 K. Schumann & K. Lauterbach Nactrage zur Flora der Deutschen Schutzegebiete in der Südsee 351
1912 S. H. Koorders Exkursionsflora, Flora von Java 3:96
1912 J. Costantine in LeConte Flore Generale des Indo Chine 4:125
1912 E. D. Merrill A Flora of Manila 380
1913 R. Schlechter Botanische Jahrbücher 50:104 "Die Asclepiadaceen von Deutsch Neu Guinea"
1918 S. H. Koorders Flora von Tjibodas 64
1920 P. F. Fyson Flora of the Nilgiri & Pulney Hill-Tops 3:283
1922 H. H. Haines Botany of Bihar & Orissa 560-561
1923 H. Ridley Flora of the Malay Peninsula 2:369-394
1923 J. S. Gamble Flora of the Presidency of Madras 2:848
1927 H. E. Osmastan A Forest Flora for Kumaon 356
Footnotes:

1 The Greek prefix 'Eu-' (= true) added with or without a hyphen, to the generic name, forms a word which earlier botanists used to indicate the same thing as G. Don intended with his "hoyae verea" i.e. the true, or original, Hoyas. This implies that the original type species and its closest relatives were members of the group so named. (in practice this did not always prove to be the case). Under the current ICBN nomenclature rules such names are illegitimate, and usually prove to be synonymous with the taxon which includes the type species of the genus and which bear, as its name, the generic name itself plus the indication of rank (viz., Section Hoya) without indication of separate authorship so as not to confuse it with the Genus.

2 There is, it appears no Article in ICBN to cover the changing of the spelling of a genus name lowered to a section as Blume has done with the section "Physostemma". It appears, however, that precedence would dictate that the original spelling be applied.
Part II

Sectional Drawings
Section Peltostemma Schlechter

Hoya imbricata Decaisne

36
Section Otostemma (Blume) Miquel

Hoya lacunosa Blume Bottom view of crown
Section Skenostemma Kloppenburg

Hoya heuschkeliana Kloppenburg

1. Flowering stem; 2 & 3. sepals, 3 views; 4. leaf; 5. corona, enlarged;
6. corona scales, 3 views; 7. flower, front view; 8. same, side view;
9. pollinia.
Section Eriostemma Schlechter

Genus Eriostemma Klpp. + Gilding

Hoya madulidii Klppenburg from Schlechter's Herb. sheet
Section Cathetostemma (Blume) Miquel

Cathetostemma laurifolium Bl.
from Blume "Mus. Bot. L-B V.1 p.60 t.14
Section Centrostemma (Blume) Hooker

Hoya multiflora Blume
Section Ancistrostemma Hooker

Hoya edeni King ex Hooker
Section Pterostelma (Wight) Hooker

A Tracht; B Bl. — C—E H. albiflora Zipp. C Gynosteg; Coron; E Pollinien. (Nach Blume, Humphre.)

Hoya albiflora Zipp. Engler & Prantl.
Section Physostelma (R. Wight) Blume

Hoya campanulata Blume
Section Oreostemma Schlechter

Hoya oreostemma Schlechter from Bot. Jahr. V. 50
Section Plocostemma (Blume) Miquel

Plocostemma lasianthum Bl.

from Blume "Mus. Biot. L-B V.1 p.59 t.13
Section Amblyostemma Kloppenburg

Hoya metaflua Merrill Syn. Hoya fraterna Blume
Hoya pubicalyx. Merrill by R.D. Medina

Hoya pubicalyx: 1. Flowering stem; 2. flower, front view & side view; 3. petals; 4. sepals, front & back views; 5. corona, front & back views; 6. corona scales, 3 views; 7. pollinia; 8. young flower, 3 views.
Genus Eriostemma (Schlechter) Kloppeenburg & Gilding


Crescit: in montanis et ad ripas circa Rompien.
Floret: per totum annum.
Nomen: aroy Kilampahan.

Translation: leaves veinless oval acute with margins recurved, leathery, beneath villose, corolla glabrous. (*Corona Ariadna* in *Rumphia Herbarium Amboinensis* 5. t 172). 1064.
Growing: in the mountains and frequently on the stream banks around Rompien. Flowers the entire year. Local name “Aroy Kilampahan”.

In establishing Section Eriostemma, Dr. Schlechter in *Botanische Jahrbücher* 50 (1913) 106 &137 (translated for the German as follows:

**Translated from the German 106:**

Section VII. Eriostemma the stems and leaves with all surfaces (parts) covered with short soft hairs; in other respects its blooms possess marked sharp characteristics. The gynostegium stands upon a column, which goes down into the crown of the collar of the corolla that is covered with shaggy cottony hairs. The corona scales are comparatively short. The blooms are large or very large with a well-developed thickly hirsute calyx. Type species of the Section is *H. coronaria* Blume.

**Translated from 135:**

Section VII. Eriostemma Schlechter. I thought it best to present here this distinctive section *Eriostemma*. This section is so well and sharply different, that one could consider whether or not to regard it as a separate sub-genus. I have so far presented above briefly the main points, but now I wish to present them once again in more detail. In habit there is a strong similarity that can be found with *EU-Hoya*, but the branches are softer and more fleshy and consistently with more or less soft hairs. The peduncles are extraordinarily thick and soft textured, the calyx as with *Pterostemma* more strongly structured, and the large hairy blooms are likewise fleshy. The gynostegium with the
corona scales stand upon a woolly matted column that is the outgrowth formed of the filaments, which are united with the corona tube. The pollinia are distinguished (marked) as opposed to the other *Hoya* species by means of the fact that the translators have undergone a strong development and exhibit a twist; also the retinaculum is rather large. The pollinia are more club shaped and moreover do not have the keel on the outer edge, characteristic of other *Hoya* sections.

We for a long time now have been aware that the species in this section have very little in common with the Genus *Hoya* and so have made the decision to place it into the Genus *Eriostemma*. In addition to the differences noted by Dr. Schlechter above, the characters of the Genus *Eriostemma* (Schlechter) Kloppenburg and Gilding are as follows:

By Edward Gilding:

Stems slightly fleshy, 3-10mm thick. All parts exude milky sap when injured. Leaves and stems covered with pubescence except in a few species, in which case the plant possesses a notable covering of indumentum on young growth but becomes glabrous when mature. Stems and the upper leaf surface are of the same color. No noticeable red pigment in young vegetative shoots. Stems twining or prostrate, supple when young, later becoming lenticelate and finally with corky bark. Petiole always developed but short, 1-5cm in length, round in cross section or nearly so without a channel on the upper surface. Leaves fleshy, 2-5mm thick, succulent, opposite in whorls. Leaves faintly glanduliferous on upper leaf surface where it is attached to the petiole. Leaf shape obovate, oblong, or elliptic, but always apiculate at the apex with recurved margins. Nerves always pinnate, sometimes not visible in fresh state. Inflorescence consists of a short peduncle that is of the same thickness and texture of the stem, the end developed into an extremely compressed peduncle. Peduncles are either persistent, flowering numerous times or deciduous and flowering only once. Flowers are produced in clusters from the end of the peduncle in numbers from one to twenty but with a mean of six. Pedicels range from 2-15cm in length, thick and supple occasionally pubescent. Calyx of five large lobes usually spatulate, adnate to corolla. Corolla always valvate, thick and rigid. Inside of corolla is ceraceous, being glabrous to densely villose. Lobes of the corolla short to elongate. Corolla lobe posture variable between species from recurved to flat or incurved. Tube short or non-existent, when present it is patellate to cupulate. Base of corolla beneath corona is unique, abruptly cupulate and adnate with column of corona, sericeous in all species. The corona column is also sheathed with corolla tissue that is densely sericeous in all species. Color of corolla ranges from white to green-yellow or orange to deep dull red-brown. The structure forms a deep inverted annulus from which nectar is produced. Corona lobes simple inornate, inner (central) lobe acute and laterally flattened. Outer lobe broad also inornate erect to flat but always broadly obtuse. Usually yellow or yellow with red areas, rarely all white. Pollinia have rhomboidal retinaculum, with the unique character of twisted translator arms, pollinia always flask-like in shape without obvious pellucid edge frequently found in *Hoya* Br. Follicles large, elongate to 35cm and thick in cross-section to 5cm. Outside pubescent or glaucus, mamillate at apex. Unique character of well developed spongiform mesocarp. Seed number 250 to 450 per follicle, freshly ochre-white in color but becoming dull green-blue with age, comate.

Specialized terminology to describe structures of *Eriostemma*:
Exterior Corolla — Corolla tissue that is on the outside of the bloom.
Inner Corolla — Corolla tissue which folded upon itself to form an deep indented annulus.
Operculum — The edge around the base of the visible corona, made of corolla tissue.
Outer Corolla — The portion of the corolla that is not folded upon itself and is generally visible from above, note that this is different from the Exterior Corolla.

<table>
<thead>
<tr>
<th>Anatomical Feature</th>
<th>Eriostemma Characters</th>
<th>Hoya Characters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stems and Petioles</td>
<td>Mostly Pubescent, Usually Green in Color, young shoots never with high anthocyanin content.</td>
<td>Occasionally pubescent, often aging to brown-tan, young shoots often with high anthocyanin content.</td>
</tr>
<tr>
<td>Leaves</td>
<td>Never Flecked, Always Green with pinnate veins and thick in texture.</td>
<td>Occasionally flecked, either palmate or pinnate veins and sometimes thin textured.</td>
</tr>
<tr>
<td>Peduncles</td>
<td>Of equal thickness to adjoining stem. Usually short and blunt.</td>
<td>Variable thickness, variable length between species. Generally more slender than those of Eriostemma.</td>
</tr>
<tr>
<td>Pedicels</td>
<td>Of equitable length to peduncle and to other pedicels.</td>
<td>Of variable length.</td>
</tr>
<tr>
<td>Calyx</td>
<td>Leaflets thick and imbricate at the base, ovate to rotund without acuminate apices.</td>
<td>Often elongate with acuminate apices.</td>
</tr>
<tr>
<td>Corolla</td>
<td>Distinctively structured Inner corolla that is folded upon itself into an inverted annulus, very woolly inside near base of corona. Whole of corolla large and thick textured.</td>
<td>Corolla near corona base rarely woolly. Very rarely with annulus, when present annulus is shallow or extroverted. Corolla often think textured.</td>
</tr>
<tr>
<td>Corona</td>
<td>Simple inner corona lobe consisting of a laterally flattened tooth-like structure adnate with staminal head. Never erect. Outer corona not hollow, without open channel on underside.</td>
<td>Inner corona of variable shape, sometimes erect. Often hollow with open channel on underside.</td>
</tr>
<tr>
<td>Pollinaria</td>
<td>Translator arms very twisted.</td>
<td>Translator arms variable but never twisted to the degree as those in Eriostemma.</td>
</tr>
</tbody>
</table>
Pollinia | Flask-shaped without obvious pellucid edge. | Variable in shape often with a visible pellucid edge.
--- | --- | ---
Fruit | Mesocarp inflated and filled with spongy material. Seeds mature to dull green-blue. | Mesocarp adnate to endocarp. Seeds mature dark-brown to white in color, never dull green-blue.

**Eriostemma Species**


*Eriostemma ariadna* (Decaisne) Klopp. & Gilding. Type ? In Prodromus Syst. Veg. 8 (1844) 635.


*Eriostemma coronaria* (Blume) Klopp. & Gilding. Type: t. 1063 in Bijdragen tot de Flora Nederlandsch Indie (Bijd. 1825).

*Eriostemma gigas* (Schlechter) Klopp. & Gilding. Type: Schlechter 19289. (B) In Botanische Jahrbücher 50 (1913) 136.

*Eriostemma guppyi* (Hemsley) Klopp. & Gilding. Type: Guppy 188. In Icones Plantarum 23 (1892) 2247.


*Eriostemma lauterbachii* (Schumann) Klopp. & Gilding. Type: Lauterbach 930 (B). In Dictionary of Gardening 1 (1885).


*Eriostemma madulidii* (Kloppenburg) Klopp. & Gilding. Type: Bolster 357. In Fraterna 3 (1990) IV.

*Eriostemma noeguinensis* (Engler) Klopp. & Gilding. Type ?. In Botanische Jahrbücher 7 (1886) 471.


*Eriostemma subcalva* (Burkill.) Klopp. & Gilding. Type Hollrung 28 (?). Kew Bull. (1901)

New considerations: I feel the section Skinostemma could be eliminated and the monotypic species *Hoya heuschkeliana* Klopp. since it has a bilobed corona could be placed in the Section Acanthostemma (Bl.) Klopp, Subsection Externatae Klopp.. That is if one wishes not to make the urceolate corolla a leading factory. Along the same line of reasoning the Section Peltostemma Schlechter could be eliminated and its species/specie since they are also bilobed could be transferred to the Section Acanthostemma.

Borneo is turning up some interesting different, and transitional species which will need consideration. To date this includes *Hoya kloppenburgii* Green and the soon to be published species *Hoya gildingii* Kloppenburg. They bridge several different present sections.