Excerpt from:

MALPIGHIACEAE
by William R. Anderson

Trees, shrubs, and vines, always perennial; hairs unicellular, usually modified or submedullated. Leaves usually opposite, often bearing large multicellular glands on the petiole or blade (usually the abaxial side) or both; stipules usually present; blade simple, usually entire, rarely lobed or pseudodeterminate. Flowers usually bisexual, subtly to strongly bilaterally symmetrical. Sepals 5, ovoidular or, most often, the lateral 4 or all 5 bearing (12) large multicellular abaxial glands; petals 5, distinct, clawed, alternating with the sepals, imbricate, the innermost (flag) petal posterior and often different from the lateral 4. Stamens mostly 10, fewer by reduction in some genera; anthers mostly dehiscent by longitudinal slits. Gynoecium superior, comprising (23) distinct to connate carpels, each fertile locule containing 1 pendent anatropous ovule; styles mostly 1 per carpel and distinct, sometimes connate or reduced in number. Fruits dry or fleshy, dehiscent or indehiscent, samaroid, nut-like, or drupaceous. Seeds without endosperm.

Tropics and subtropics (mostly between 30°N and 30°S, mostly New World) but also found in the Old World, especially Africa and Madagascar; about 67 genera with over 1290 species, 23 genera and 183 species in the flora area.

Much of this treatment is modified from my paper on the Malpighiaceae of the Guayana Highlands (Mem. New York Bot. Gard. 32: 21–305. 1981), which contains full descriptions of many of these species. Successful use of the keys to genera and species requires an understanding of what I mean by certain morphological terms. The anostal interference of the Malpighiaceae was a race of cincinnati, but in many genera the cincinnati have been reduced to one-flowered units. Each flower is borne on a pedicle, whose base is defined by a joint; below the joint the stalk is called the peduncle, and the peduncle bears two bracteoles, which can be borne anywhere on the peduncle but are most commonly at or near its summit; the peduncle is subtended by a single bract. The peduncle has been lost in several evolutionary lines, in which case the pedicel is described as sessilis, subtended then by a cluster of the bract and two bracteoles.

The Malpighiaceae are notable for having highly stereotyped flowers (5 sepalas mostly with paired abaxial glands on at least the lateral 4 in the New World, 5 clawed petals, mostly 10 stamens, mostly 3 carpels with distinct styles), and as a consequence identification to genus of flowering specimens can be difficult. Understanding the variation in styles and stigmas, and the terminology used to describe that variation, is essential. Most byronsonid genera (Byronsona, Burdachia, Byronina, Diocedia, Glockenia, Lophanthus, and Pierandra in the flora area) have subulate styles, i.e., slender styles that taper gradually distally to minute stigmas (Fig. 71, A–C). In most cases the stigma is terminal on the style but in some species it is slightly internal, i.e., the stigmatic tissue is on the internal angle of the style apex. In all other genera in the flora area the styles are less tapered distally, such that the stigmas are larger, and their position is correspondingly easier to discern. Some of these genera have the stigmas terminal or nearly so, i.e., the stigmatic tissue is distributed evenly over the entire apex of the style. Our genera with consistently terminal stigmas on thick styles are *Basioniopis*, *Buchanias*, *Diplopterys*, and *Spachea*, but similar styles also occur in some species of *Heteropitys*, *Malpighia*, *Mascagnia*, and *Tetrapitys* (Fig. 71, D–F). See also figures of *Diplopterys caliderana* and *Spachea elegans* below. The rest of our Malpighiaceae, including all or most species of *Clusia*, *Dicella*, *Exacandra*, *Heteropitys*, *Hiraea*, *Jubelina*, *Lophopitys*, *Malpighia*, *Mascagnia*, *Melia*, *Stigmaphyllon*, and *Tetrapitys*, have the style stigmatic on the internal angle of the apex; in the descriptions below these are called internal stigmas (Fig. 71, G–L). See also figures of *Dicella julianii*, *Exacandra adenospora*, *Hiraea faginosa*, and *Melia huberi* below. Dorsally the apex of those styles is variable, and that variation has great systematic utility. Such a style tip may be dorsally rounded, truncate, acute, or extended into a hook, and in *Stigmaphyllon* that extension often bears flap-like lateral outgrowths called foliodes.

In contrast to their relatively uniform flowers, the fruits of Malpighiaceae are exceedingly diverse. Much of that diversity is represented in this flora. The principal dispersal agents for our Malpighiaceae are birds, wind, and water, but a few fruits have no obvious adaptation for dispersal. Three genera of shrubs and trees, representing different clades in the family, have independently evolved flashy bird-dispersed fruits ranging in size from a pea to a small plum; they are *Buchanias*, *Byronina*, and *Malpighia*. No one has ever actually studied their dispersal, so my statement that they are dispersed by birds represents an assumption, and it is possible that small mammals are also involved. Among the many genera of vines, most of which probably share a common ancestor, the usual fruit is a dry schizocarp, with
The mericarps float by increasing the surface area and trapping air. Diplotypis is clearly derived from Bonisperis, while Clondenia probably originated in either Heterotropis or Mascarina. Almost all the larger genera of samara-producing vines contain one or more species in which the samaras have had the principal wing reduced or lost, often augmented by new supernumerary singlets or various kinds of serenchyma or air-filled chambers. In our flora, that tendency is well developed in species of Heterotropis, Hiraee, Jubelina, Mezia, Stigmaphyllon, and Tetrapterys. Finally, there are a few groups in which the fruits seem to have no obvious adaptation for dispersal. Pterandra is a genus of trees and shrubs in which the distinct carpels grow into small dry indehiscent coci without wings or flesh, although the areole may be surrounded by spongy tissue (see C. Anderson's revision, cited below under Pterandra). They are probably dispersed by water or by wind with other small bits of detritus. Given the nature of its fruits, the genus has achieved an impressive distribution, from Panama to southern Brazil, and an endemic species occurs at 1000 m on Cerro Sipapo in our area; one wonders how it got there! In Blepharandra and Discodia galphimiosides the fruit is a tiny indehiscent nut without wings, flesh, or serenchyma. These fruits also seem likely to be dispersed by wind with detritus. If the fruit were retained in the old flower the whole unit might aid dispersal by wind, but my observations on B. hypoleuca indicate that the fruits fall out and collect under the plant. The more derived species of Discodia (Sipapos sensu Magnus) have the sepals enlarged as an adaptation for dispersal by wind.

In addition to the 23 genera treated here, there are two additional genera at 1000 m or higher on the Serra Aracu of Amazonas, Brazil, either or both of which may eventually be found in the Venezuelan Guayanas. These are Acantharum (A. Juss.) Griseb. and Versucularia A.Juss. Both are shrubs or trees with elagandra leaves and bracteoles, slender subulate styles, and unwinged fruits, so they will come out with Blepharandra, Byronima, Discodia, and Pterandra in the keys to genera. In both Acantharum and Versucularia the inflorescence is an unbranched thyrs or pseudosapere, corymbous or elongated, terminating a main axis or a lateral axis with one pair of leaves. Acantharum has the outer anther locules winged for their whole length, white or pink petals, sessile pedicels, and deciduous stipules 15–110 mm long with the four at a node cohered or connate to form a sheath. In Versucularia the outer anther locules bear a line or cluster of vesicular outgrowths toward the apex, the petals are yellow, the pedicels are petaloid, and the persistent stipules are up to 2 mm long and distinct or basally connate. There is one species each of Acantharum and Versucularia on Serra Aracu. Acantharum paraflora W.R. Anderson is described in my revision of the genus (Cact. Univ. Michigan Herb. 11: 41–50, 1975), and Versucularia picii W.R. Anderson is described in my 1981 paper on the Guayanas Highlands, cited above.

Key to the Genera of Malpighiaceae based on flowering material

1. Styles slender and subulate, tapering to minute stigmas; shrubs or trees
   1. Styles slender to stout, of uniform thickness or widened at apex, the stigma large; vines, shrubs, or trees
      2. Leaves bearing large glands on petiole or abaxial surface of blade; some bracteoles often bearing large apical or abaxial glands
      2(1)
2. Leaves and bracteoles eglandular (except for tiny peltate dots in blade and gland-tipped marginal teeth or cilia on bracts and bracteoles in some species) .................................................. 5

3(2). Anthers with 2 dark longitudinal wings on outer locules; carpels connate only along a narrow central axis, separating in fruit .......................... 15. Lepanthoideae

3. Anthers unwinged; carpels broadly and persistently connate .................. 4

4(3). Stipules connate intrapetiolarily, persistent; flower buds spheroidal; connec-
tive of anthers enlarged, greatly exceeding the apically rounded
locules; filaments glabrous ................................................. 4. Burancieae

4. Stipules connate interpetiolarily, caducous, leaving a large interpetiolar
car; flower buds pyramidal; connec
tive of anthers exceeded by ex
tended filaments from the apically
tapered locules; filaments densely his
tate ......................................................................................... 11. Glandionia

5(2). Inflorescence a tight umbrilicate fascicle, secaline or subsecaline, auxiliary to leaves or bracts or leaf scars on older stems; carpels distinct; petals slightly rotate to 20. Petenandra ................................. 6

5. Inflorescence an elongated terminal thyrsus or pseudoeulalia; carpels con-
nate, at least in flower; petals glabrous or rarely bearing a few hairs
without specially modified or directed hairs; hairs on leaves (if any)
mostly modified or submodified or branched, rarely basifixed or sub-basifixed ........................................ 5. Byrsounema

6. Anthers bearing few to many basified or semi-basified hairs, the apical ones
stiff and directed slightly forward; hairs on leaves (if any) mostly basified or sub-basified ........................................ 7

7(6). Petals yellow; anthers with 2–4 stout apical awn-like hairs, those
strongly differentiated from other hairs on stamens, if any; stamens
6–10; ovary with only 2 locules developed and containing ovules
.......................................................................................... 7. Dicelia

7. Petals white and/or pink, or white and the posterior pale yellow; authors
with apical hairs hardly or not at all different from other hairs on sta-
mens; stamens 10; ovary with all 3 locules fertile, except in some popu-
lations of B. floribunda (a few pink-flowered species of Byrsounema have
authors that mimic those of Blaspharadendron, from which they differ in
having stipules connate to form an intrapetiolary pair, connective of an-
thers much exceeding fertile part of locules, and ovary sericeous at
apex) .......................................................................................... 2. Blaspharadendron

8(1). Petals pink or rose and/or white, or lisle ......................................... 9

8. Petals yellow, or yellow with a red central blotch or red flecks, or yellow
turning red, or brownish ................................................................ 15

9(8). Stipules large, 3–6 mm long, intrapetiolarily and completely connate; leaf
blades bearing 2–4 impressed glands in adaxial surface near apex
.......................................................................................... 21. Specnea

9. Stipules small, up to 2 mm long, interpetiolarily or borne on base of petiole;
different; leaf blades without adaxial glands .................................. 10

10(9). Inflorescence an unbranched auxiliary umbel or corymb; shrubs or small
trees ......................................................................................... 17. Malpigia

10. Inflorescence an elongated pseudoeulalia or compound panicle or cyme.

11(10). Petals (at least the lateral 4) with a prominent abaxial wing .............. 12

11. Petals abaxially smooth or at most carinulate ................................... 13

12(11). Ultimate units of inflorescence tight corymb or umbels of 4–10 flowers ........................................ 12. Heterotropys

12. Ultimate units of inflorescence elongated pseudoeulaeae comprising
(15–)20–50 flowers ..................................................................... 6. Clonodia

13(11). Styles with stigmas quite terminal and without any sort of dorsal exten-
sion at apex ............................................................................. 1. Banisteriopsis

13. Styles with apicule persistent on internal angle and dorsally rounded, trun-
cate, acute, or extended into a hook ........................................... 14

14(13). Calyx with 1 large central gland on each of the 4 lateral sepals, the ante-
rior sepals eglandular; ultimate units of inflorescence umbels of 4 flow-
ers or corymb of 6; bracts and bracteoles 4–8 mm long ........................ 14. Jubelina

14. Calyx with the 4 lateral sepals biglandular, the anterior sepals eglandular;
ultimate units of inflorescence pseudoeulaeae of (15–)20–50 flowers; bracts
and bracteoles up to 5 mm long, mostly smaller ................................ 18. Macagnia

15(8). Styles with stigmas quite terminal and without any sort of dorsal exten-
sion at apex ............................................................................. 16

15. Styles with apicule stigmatic on internal angle and dorsally rounded, trun-
cate, acute, or extended into a hook or flap-bearing appendage .......... 23

16(15). Petals completely concealed by sepals during enlargement of bud, emerg-
ing only when flower opens ................................................................ 18. Macagnia

16. Petals (at least the outermost) exposed during enlargement of bud ......... 17

17(16). Stipules borne on base of petiole; carpels 2 or 3, completely connate in
ovary, developing into an indehiscent fleshy fruit; styles as many as
carpels, distinct or connate and then apparently only 1; trees or shrubs
.......................................................................................... 3. Bunchonia

17. Stipules interpetiolarily or absent; carpels 3, centrally connate in ovary, the
fruit dry and schizocarpic; styles 5, distinct; vines or shrubs................. 18

18(17). Calyx bearing 10 glands; bracteoles wider than floriferous bracts and
often longer, often bearing marginal or abaxial glands ......................... 23. Tetraprys

18. Calyx bearing 8(9) glands or eglandular; bracteoles as large as bracts or
smaller, eglandular ........................................................................ 19

19(18). Petals abaxially sparsely to densely sericeous .................................. 20

19. Petals glabrous ............................................................................. 21

20(19). Petals abaxially sparsely sericeous, long-fimbriate .......................... 2. Diplorhynchos

20. Petals abaxially densely sericeous, denticulate to lacerate .................. 1. Banisteriopsis

21(19). Pedicels sessile ........................................................................ 1. Banisteriopsis

21. Pedicels raised on peduncles 1–6 mm long ........................................ 22

22(21). Flowers borne ultimately in umbels of 4–6; leaf blades abaxially densely
sericeous or very thinly sericeous to glabrate .................................... 13. Tetraprys

22. Flowers borne ultimately in pseudoeulaeae of 6–25, the terminal 4 some-
times crowded into an umbel; leaf blades abaxially sparsely densely
sericeous ..................................................................................... 10

23(16). Bracteoles larger than bracts, globose-cylindrical, borne just below
flower, enclosing bud until flower opens; pedicels absent or up to 2–5
mm long in fruit, the peduncles well developed ........................................ 19. Mezia
Bracteoles mostly similar to bracts or smaller than them, if larger not
closing bud until flower opens; pedicels well developed relative to pe-
duncles ........................................................................................................ 24
24(23). Calyx with 1 large central gland on each of the 4 lateral sepalas, the
anterior sepal eglanular ........................................................................ 16. Lophanthrys
24. Calyx with 2 glands on each of the 4 lateral sepals or on all 5 sepals, or all
sepals eglanular ...................................................................................... 25
25(24). Pedicels sessile ........................................................................... 26
25. Pedicels pedunculate ......................................................................... 29
26(25). Flowers borne ultimately in pseudocarces of 2–13 ........................ 18. Mascagnia
26. Flowers borne ultimately in umbels of 3–15 or more ........................ 27
27(26). Stipules well developed, epipetalar, often subulate, usually borne at or
beyond middle of petiole, if borne near base of petiole the stipules
≥ 2.5 mm long; inflorescences axillary .............................................. 13. Hreaea
27. Stipules none or very small and triangular, borne on or beside base of
petiole, if borne on base of petiole the stipules < 1 mm long; inflores-
cences terminal or axillary and terminal ........................................... 28
28(27). Petioles biglandular at base ....................................................... 12. Heteropterys
28. Petioles biglandular at apex, or eglanular with glands on abaxial base of
blade ........................................................................................................ 22. Stigmaphyllum
29(28). Petioles abaxially ± densely sericeous or tomentose ................. 30
29. Petioles glabrous or at most very sparsely sericeous ....................... 32
30(29). Full-sized styles 2, posterior, the anterior style often present as a short,
slender rudiment; ovary with only the 2 posterior locules developed
and fertile; anthers with locules densely hairy .................................... 8. Dicella
30. Styles 3, equal or the anterior slightly shorter; ovary with all 3 locules
developed and fertile; anthers glabrous or at most sericeous on conca-
tive ........................................................................................................... 31
31(30). Bracteoles eglanular or bearing a row of stalked marginal glands
.............................................................. 18. Mascagnia
31. One of each pair of bracteoles bearing 1 large eccentric abaxial gland
.............................................................. 23. Tetrapitys
32(29). Sepals erect or appressed in anthesis ........................................... 33
32. Sepals revolute at apex in anthesis .................................................. 19. Mascagnia
33(32). Apex of styles (2 or all 3) dorsally extended into a long book or flap-
bearing appendage .............................................................................. 22. Stigmaphyllum
33. Apex of all styles dorsally rounded, truncate, acute, or short-hooked 34
34(33). Flowers borne ultimately in elongated to congested pseudocarceses 35
34. Flowers borne ultimately in umbels of 4–6 ........................................ 38
35(34). Bracteoles smaller than bracts, borne well below apex of peduncle; lateral
4 sepals biglandular, anterior eglanular; carpels with 1 crest on each
........................................................................................................... 15. Lophanthrys
35. Bracteoles mostly larger than bracts, borne at or slightly below apex of
peduncle; all 5 sepals biglandular; carpels with 2 or more crests on each
side .......................................................................................................... 23. Tetrapitys
36(34). Stipules none or borne on base of petiole; carpels smooth-sided.
........................................................................................................... 12. Heteropterys
36. Stipules interpetiolar, distinct or connate; carpels with lateral crests,
with lateral wing in fruit .................................................................. 37(32).
37(35). Sepals all abaxially biglandular ................................................... 38
37. Sepals all eglanular or the lateral 4 biglandular and the anterior
eglanular .............................................................................................. 39
38(37). Petals completely concealed by sepals during enlargement of bud,
emerging only when flower opens ..................................................... 18. Mascagnia
38. Petals (at least the outermost) exposed during enlargement of bud
........................................................................................................... 23. Tetrapitys
39. Petioles biglandular .......................................................................... 40
40(39). Flowers borne ultimately in umbels of 4, sometimes with an additional
pair of flowers borne below the terminal umbel .................................. 41
40. Flowers borne ultimately in elongated to congested pseudocarceses ....... 42
41(40). Petioles 1–4 mm long ................................................................. 12. Heteropterys
41. Petioles 10–20 mm long .................................................................. 16. Excentrotrapezia
42(41). Petioles glands borne between middle and apex .......................... 12. Heteropterys
42. Petiole glands borne at or slightly above base .................................. 43
43(42). Mature leaf blades abaxially metallic-sericeous, the hairs so dense and
pressed as to completely conceal epidermis; inflorescence compound,
paniculate, the ultimate pseudocarceses containing 2–16 flowers; bracts
eglanular or biglandular; bracteoles eglanular .................................... 18. Mascagnia
43. Mature leaf blades abaxially sericeous to glabrescent, the hairs never
dense enough to completely conceal epidermis; inflorescence simple,
panicle; ultimate pseudocarceses containing 20–60 flowers; bracts
eglanular; 1 of each pair of bracteoles bearing 1 large eccentric abaxial gland 12. Heteropterys

Key to the Genera of Malpighiaceae based on fruiting material

1. Fruits themselves unwinged, the sepals sometimes accrescent or wing-
like in fruit; fruits schizocarpic or indehiscent .................................... 2
1. Fruits winged, the wings reduced in some species to winglets or dissec
ted crests; fruits schizocarpic ............................................................... 12
2(1). Fruits schizocarpic, the mericarps dry, or the carpels distinct even in
flower; cereals small, scattered ................................................................ 3
2. Fruits indehiscent, dry or fleshy ....................................................... 5
3(2). Leaves and bracteoles eglanular (except for tiny pellucid dota in leaf
blades of some species) ....................................................................... 20. Pinarthra
3. Leaves bearing large glands on petiole or abaxial surface of blade; some
bracteoles often bearing large apical or abaxial glands ....................... 4
4(3). Styles slender and subulate, the stigmas minute; anthers longitudinally
winged; leaf blades without adaxial glands ......................................... 15. Bapitathera
4. Styles stout, truncate or subulate at apex; anthers unwinged; leaf
blades bearing 2–4 impressed glands in adaxial surface near apex
........................................................................................................... 21. Spachea
5(2). Woody vines; sepals greatly enlarged in fruit, forming narrowly elliptic
or obovate wings 20–55 mm long, these strongly unequal, the posterior 2
longest, the anterior shortest ............................................................... 8. Dicella
5. Shrubs or trees; sepals accrescent or not in fruit but not longer than 13 mm, equal or subequal ........................................ 6
6(5). Leaves and bracteoles glandular (except for gland-tipped marginal teeth or cilia on bracts and bracteoles in some species) ........................................ 7
6. Leaves bearing large glands on petiole or abaxial surface of blade; bracteoles glandular or some bracteoles bearing large abaxial glands ........................................ 9
7. Fruits 4–15 mm diameter or larger, the stone covered by a fleshy exocarp, hairs on leaves, if any, mostly basifixed or sub-basifixed ........................................ 5. Byrsonima
8. Fruits up to 3.5 mm diameter, dry at maturity; the stone covered by a very thin, nonfleshy coat; hairs on leaves (if any) mostly basifixed .......................... 8
8(7). Fruits with only 2 locules; anthers with 2–4 staminal awn-like hairs, these strongly differentiated from other hairs on stamen, if any; sepals slightly to greatly accrescent in fruit ........................................ 7. Dictydia
9. Fruits up to 3 fertile locules (only 2 in some populations of B. fimbricata), anthers with apical hairs all different forms, all different forms of hairs on other hairs on stamen; sepals not or hardly accrescent in fruit ........................................ 2. Blepharandra
10. Fruits with a soft fleshy exocarp, dry and corky or fibrous at maturity; inflorescence terminal, with each bract subtending a short cincinnus of 1–6 flowers; styles slender and subulate, distinct, the stigmas minute ........................................ 10
11. Fruits with an edible fleshy yellow, orange or red exocarp at maturity; inflorescence lateral, with each bract subtending 1 flower; styles stout, distinct or connate, with large stigmas ........................................ 11
10(9). Stipules connate intrapetiolarly, persistent; filaments glabrous or connate ........................................ 10
11(8). Stipules connate interpetiolarly, caducous, leaving a large interpetiolar scar; filaments densely hirsute ........................................ 11. Glanidinia
11(9). Flowers borne in pseudoracemes; bracteoles 1 (or both) often bearing 1 large abaxial gland; styles 2 or 3, distinct; sepals more or less ovate, and/or apparent only 1; stipules borne on base of petiole ............. 3. Bucnocha
11. Flowers borne in umbels or corymbs; bracteoles all glandular; styles 2, distinct; stipules borne on stem between petioles ............. 12. Malpighia
12(1). Mericarps with wings very short relative to size of nut, often dissected and irregular or rudimentary ........................................ 13
12. Mericarps samaroid, with either dorsal or lateral wing(s) well developed ........................................ 14
13(12). Flowers borne ultimately in a pseudoraceme, sometimes reduced to a single pair ........................................ 14
13. Flowers borne ultimately in umbels or corymbs of (300–) 6–16 ........................................ 16
14(13). Mericarps bearing a dorsal winglet but no lateral winglets smooth or at most somewhat rugose ........................................ 12. Heteropitys
14. Mericarps bearing a dorsal crest or winglet and several winglets or enclosed or acutely outgrowths on each side of mericarps ..................... 15
15(14). Pseudoracemes comprising (15–) 20–50 flowers; woody vines, occasionally shrubby; blade of larger leaves (2.5–) 4–6(–7) cm wide ........................................ 6. Clomodia
15. Pseudoracemes comprising 2–12–22 flowers; shrubs 0.2–1 m tall; blade of larger leaves 0.9–2.8 cm wide ........................................ 23. Tetrapteryx
16(13). Stipules epipetiolar, usually borne at or beyond middle of petiole, often subulate ........................................ 13. Hymen
16. Stipules interpetiolar, short, triangular ........................................ 17
17(16). Mericarps with a dorsal crest or winglet 1.5–6 mm wide and essentially 4 roughly parallel ridges or winglets 0.5–10 mm wide on each side, these irregular, dissected, and interconnected with transverse ridges ........................................ 9. Diplopitys
17. Mericarps with a dominant terminal dorsal wing 4–9 mm long and several lateral ribs or crests radiating from the areole .......... 22. Stigmaphyllon
18(12). Samaras with dorsal wing dominant, the nut bearing on its sides only short winglets or crests or quite smooth ........................................ 21
18. Samaras with lateral wing(s) dominant, the dorsal wing smaller or reduced to a winglet or crest, occasionally absent ........................................ 21
19(18). Wing of samara with the abaxial edge thickened, the veins diverging and branching from it toward the thinner adaxial edge ............................. 19
19. Wing of samara with the adaxial edge thickened, the veins diverging and branching from it toward the thinner abaxial edge ........................................ 20
20(19). Styles with stigmas quite terminal and without any sort of dorsal extension at apex ........................................ 1. Banisteropsis
20. Styles with apex stigmatic on internal angle and a prominent dorsal extension of apex in the form of a hook or flaps .......... 22. Stigmaphyllon
21(18). Bracteoles larger than bracts, globose-cymbiform, borne just below flower, enclosing bud until flower opens; pedicel absent or up to (5–) 8 mm long in fruit, the peduncle well developed, 7–25 mm long in fruit .......... 19. Meia
21. Bracteoles similar to bracts or smaller than them, or if larger not enclosing bud until flower opens; pedicel well developed relative to peduncle ........................................ 22
22(21). Calyx with 1 large central gland on each of the 4 lateral sepals, the anterior glandular ............. 23
22. Calyx glandular or with 2 glands on each of the 4 lateral sepals or on all 5 sepals ........................................ 24
23(22). Lateral wings of samara directed sideways, semi-circular or as long as wide; bracteoles 4 mm long or longer; flowers borne ultimately in umbels of 4 or corymbs of 6; fertile locule of samara accompanied on each side by a parallel sterile cavity developed in base of lateral wing during maturation ........................................ 14. Jubelina
23. Lateral wings of samara directed forward, 3 or more times as long as wide; bracteoles 1.5–3 mm long; flowers borne ultimately in elongate pseudoracemes of 4–50; fertile locule of samara without petals or sepals ........................................ 16. Lophopterys
24(22). Pedicels sessile ........................................ 25
24. Pedicels pedunculate ........................................ 26
25(24). Flowers borne ultimately in pseudoracemes of 2–16; stipules (5.5–8 mm long), triangular, borne on petioles at or somewhat above base ........................................ 18. Mascolina
25. Flowers borne ultimately in umbels of 4; stipules mostly subulate, borne on pediole usually at or beyond middle, if borne near base of pediole the stipules ± 2.5 mm long
26(24). Samaras with 4 discrete lateral wings, 2 on each side (in some species the 4 lateral wings may be accompanied by several long acute, outgrowths between them) ........................................... 23. Tetrapterys
26. Samaras with 1 continuous lateral wing or 2, 1 on each side .................................................. 27
27(26). Flowers mostly borne ultimately in pseudocammas (2–4–5–9), these occasionally congested into corollas or umbels; bracteoles eglandular or all bearing several small stalked marginal glands ........................................... 18. Masconia
27. Flowers borne ultimately in umbels of 4; one of each pair of bracteoles bearing 1 large, sessile, eccentric axillary gland .............................. 10. Excentrodinia


Banisteria sensu A. Juss., Giseb., and Nied., non L. 1753.

Vines, shrubs, or rarely small trees. Leaves bearing glands on petiole or abaxial surface of blade or both; stipules small, distinct, interpetiolar. Flowering bracts and bracteoles eglandular; pedicels usually sessile, raised on a peduncle in a few species. Petals yellow, pink, or white, usually the lateral 4 spreading or reflexed and the posterior erect. Stamens 10, all fertile, anthers alike or more commonly heterothecic. Ovary with the 3 carpels adnate to a common torus, all fertile; styles 3, of uniform thickness or thicker distally, the stigmas terminal. Fruit breaking apart into 3 samaras separating from a short pyramidal torus, each samara having its largest wing dorsal, thickened on the adaxial (upper) edge, the veins terminating in the thinner abaxial edge; much shorter winglets, crests, or irregular outgrowths present on sides of nut in some species; nut usually with a functional carpophore.

Mexico, Central America, West Indies, and South America (all countries except Chile and Uruguay); 94 species, 19 in Venezuela, 10 of these in the flora area.
See Banisteriopsis, Diplodectes (Malpighiaceae) by Browne Gates [Fl. Neotrop. Monogr. no. 30. 1982].

Key to the Species of Banisteriopsis

1. Leaf blades very densely and persistently metallic-sericeous abaxially ........................................... 2
   1. Leaf blades glabrescent or thinly sericeous to glabrate abaxially, the hairs at maturity never dense enough to completely hide the epidermis ........................................... 3
   2(1). Petals pink, paler in age, the posterior yellow in proximal half; pedicels raised on a peduncle 0.5–3.5 mm long; nut of samara rugose, tuberculate, muricate, or bearing irregular winglets on sides .................................................. B. muricata
   2. Petals all yellow; pedicels mostly sessile, rarely raised on a peduncle up to 1 mm long; samara unknown, but its nut probably smooth-sided, or possibly bearing 1 wing on each side .................................................. 3
   3(1). Bracts and bracteoles deciduous before or during anthesis, or immediately afterwards; petals rose-pink turning white in age; nut of samara hairy on inner surface of locule ........................................... B. cupa
   3. Bracts and bracteoles persistent; petals all yellow; nut of samara glabrescent within locule ....... 4

4(3). Sepals all eglandular ........................................... 6
   4. Lateral 4 sepals biglandular, anterior eglandular .............................. 6
   5. Flowers produced on leafless stems, the inflorescences axillary to scars of leaves of previous seasons; styles densely bearded for ½–¼ their length, the long spreading hairs especially anterior on erect style; nut of samara bearing on each side 3–7 crest-like radiating ridges from the areole ........................................... B. cristata
   5. Flowers produced on currently leafy stems; styles glabrous; nut of samara unappended on sides, smooth or with reticulate veins prominent ........................................... B. martianus
   6(4). Specimens with flowers ........................................... 7
   6. Specimens with fruits ........................................... 12
   7(6). Petals, especially the lateral 4, densely sericeous abaxially .............................. 9
   7. Petals glabrescent ........................................... 8
   8(7). Petioles of larger leaves usually bearing 2 large glands at or slightly below apex; bracts and bracteoles 1–1.7 mm long, slightly concave to nearly flat, spatulate or subrotund, spreading to reflexed; anthers glabrous; nut of samara bearing several winglets on each side, nearly parallel to the areole ........................................... B. kraboffii
   8. Petioles eglandular; bracts and bracteoles up to 1 mm long, cymbiform or triangular, erect to oppressed; anthers with the locules pubescent; nut of samara with several to many ridges or crests on each side, radiating from the areole ........................................... B. lucida
   9(8). Lateral petals subentrive to denticate, especially at base of inner wing pedicels .............................. B. wuldaickii
   9. Lateral petals imbricate or lacerate or at least distinctly dentate all around margin of limb, pedicels sessile ........................................... 10
10(9). Leaf blades deeply cordate at base, the lobes often equaling petiole; inflorescence usually glabrous, rarely sericeous to glabrate ........................................... B. pucherrima
10. Leaf blades truncate, rounded, or shallowly cordate at base; inflorescence hairy, the hairs usually persistent ........................................... 11
11(10). Inflorescence golden-sericeous; connective of anthers opposite 3 anterior sepals only slightly exceeding locules, by up to 0.5 mm; reduced leaves in inflorescence entire, the margin eglandular or bearing tiny glands ........................................... B. exiguus
11. Inflorescence minutely brown- or white-tomentose; connective of anthers opposite 3 anterior sepals greatly exceeding locules, by 0.6–1 mm; reduced leaves in inflorescence usually bearing well-developed glands or ciliate processes on margin ........................................... B. martianus
12(6). Nut of samara unappended on sides, the veins sometimes prominent ........................................... 13
12. Nut of samara bearing winglets, crests, or ridges on sides ........................................... 13
13(12). Flowers borne ultimately in short pseudocammas of 10–25 ........................................... B. wuldaickii
13. Flowers borne ultimately in umbels of 4–6 ........................................... B. caapi

Banisteriopsis caapi (Giseb. in Mart.) C.V. Morton, J. Wash. Acad. Sci. 21: 486. 1931.
—Banisteria caapi Giseb. in Mart., P. Bras. 12(1): 43. 1885. —Apua-pana, Capi, Yape.


Wood vine; blade of larger leaves 6–12.5 × 3.5–10 cm, rounded or shallowly cordate at base, abaxially sparsely to moderately hairy; petiole 5–10 cm, densely to sparsely golden-serrate, the flowers usually borne determinate in panicles of up to 7 pairs, rarely in umbels of 4 flowers; reduced leaves of inflorescence more than 3.5–7.5 cm, abaxially sparsely hairy; petioles yellow, glabrous; anthodia glabrous, anthodes yellowish, anthode bracts persistent; lateral 4 sepals biglandular, anterior eglandular; petals yellow, glabrous, long-fimbriate; anthodomes yellow, with the connective much enlarged and glandular; pubescent unknown, the nut probably smooth-sailed, possibly bearing 1 winglet on each side. Lowland forests, 100–200 m. Delta Amacuro (town of Sierra Inamata east-southeast of Las Castillas), Bolívar (Rio Caura, Rio Paragua). Brazil (PARKIMANIA).


Wood vine; blade of larger leaves 6–12.5 × 3.5–10 cm, rounded or shallowly cordate at base, abaxially sparsely to moderately hairy; petiole 5–10 cm, densely to sparsely golden-serrate, the flowers usually borne determinate in panicles of up to 7 pairs, rarely in umbels of 4 flowers; reduced leaves of inflorescence more than 3.5–7.5 cm, abaxially sparsely hairy; petioles yellow, glabrous; anthodia glabrous, anthodes yellowish, anthode bracts persistent; lateral 4 sepals biglandular, anterior eglandular; petals yellow, glabrous, long-fimbriate; anthodomes yellow, with the connective much enlarged and glandular; pubescent unknown, the nut probably smooth-sailed, possibly bearing 1 winglet on each side. Lowland forests, 100–200 m. Delta Amacuro (town of Sierra Inamata east-southeast of Las Castillas), Bolívar (Rio Caura, Rio Paragua). Brazil (PARKIMANIA).


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Key to the Varieties of B. maguirei

1. Hairs of inflorescence rusty brown; leaf blades pinnate, 5.5–12 cm long; bearing cupulate marginal glands, Delta Amacuro and Bolivar... var. maguirei

2. Hairs of inflorescence white or gray; leaf blades pinnate, 5–7 cm long; bearing minute marginal glands; Amazonas

B. maguirei var. maguirei

1. Hairs of inflorescence rusty brown; leaf blades pinnate, 5.5–12 cm long; bearing cupulate marginal glands, Delta Amacuro and Bolivar... var. maguirei

2. Hairs of inflorescence white or gray; leaf blades pinnate, 5–7 cm long; bearing minute marginal glands; Amazonas

B. maguirei var. parvifolia

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B. maguirei var. parvifolia

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2. Hairs of inflorescence white or gray; leaf blades pinnate, 5–7 cm long; bearing minute marginal glands; Amazonas

B. maguirei var. parvifolia
Blepharandra

schomburgkiana (Senth.) C.B. Rob. in

Woody vine, sometimes shrubby; blade of
larger leaves 5.5–14 × 3–8 cm, abaxially (in
the floriferous) very densely and persistently
metallic-sericous (silver or golden); inflores-
cence with flowers borne ultimately in um-
hels of 4; pedicels raised on a peduncle 0.5–
3–7 mm long; bracts and bracteoles perma-
tent; sepals all oblong or the lateral 4
biglandular; petals glabrous, pink, pale in
age, the posterior yellow proximally; anthers
glabrous, some with the connective much en-
larged and glandular; samaras (16–24–4–
(6) × (9–)11–16–(20) mm, the nut rugose,
tuberulate, marginate, or bearing irregular
winglets on sides. Wet forests to drier, a dis-
turbed woods, often growing at edge of
wooded areas along rivers and ravines, 100–
400 m; common in northern Bolivia. Else-
where in Venezuela known from most states;
Mexico, Central America, Colombia, Guyana,
French Guiana, Ecuador, Peru, Brazil, Bol-
ivia, Paraguay, Argentina.

Banisteriopsis pulcherrima (Sandwith)
B. Gates, Brittonia 31: 109. 1979

Woody vine or shrub; blade of larger
leaves 8–16 × 4–12 cm, deeply cleft at
base, glabrous, usually with tooth-like mar-
ginal glands or ciliate processes; inflores-
cence usually glabrous, rarely sericeous to
cleratochene; the flowers borne ultimately in
umbels of 4; reduced leaves in inflorescence
with ciliate processes up to 6 mm long around
margin; lateral 4 sepals biglandular, ante-
rior eglandular; petals yellow, filiform, gla-
brous; anthers glabrous, those opposite the 3
anterior sepals with connective much en-
larged; samaras 27–39 × 10–13 mm, the nut
unappendaged on sides, sometimes with
prominent veins. Wooded slopes, roadside,
savannas, 300–2200 m; southeastern Bolivar
(Gran Sabana). Western Guyana.

Banisteriopsis wurdackii B. Gates,
Brittonia 31: 109. 1979

Woody vine; blade of larger leaves 10–19 ×
4.5–10.5 cm, abaxially sparsely sericeous;
inflorlescences similar to flowersborne ulte-
rimately in pseudolobanozas of 10–25 pedicels
on a peduncle 0.5–2–(3) mm long; bracts
and bracteoles persistent; lateral 4 sepals big-
landular, anterior eglandular; petals yellow,
glabrous, subdeterminate, especially at
base of limb; anthers glabrous; samaras
25–46 × 10–15 mm, the nut bearing on each
side a single winglet parallel to aril.
Semi-deciduous to evergreen woodland
and lower montane forests, 50–400 m; north-
western Bolivar (El Marcano, Rio Parguaza,
Rio Villano). Merida, Coasts, Ria, Panama,
Colombia, French Guiana, Ecuador, Peru,
Brazil, Bolivia.


Trees or shrubs, the hairs often basifixed or sub-basifixed. Leaves
biglandular; stipules intra- and epipetiolar, distinct from each other
but often basally connate with opposite stipules to form an interpetiolar
sheath; blade with many (12–20 or
more) fine parallel lateral veins interconnected by a fine elaborate reticulum. Inflo-
rescence a thyrse or pseudotraceme composed of 1–several-flowered
cincinni; bracts and bracteoles without abaxial glands. Sepals all oblong
biglandular; petals white, pink, or red (posterior petal pale yellow in
2 species), glabrous or bearing a few hairs on the claw. Stamens 10;
filaments distinct, hisporate with straight basifixed hairs; anthers with locules bearing at least apical tufts of basifixed hairs and often
hisporate on sides as well. Ovary of 3 completely connate carpels, all fertile or the ante-
rior empty, glabrous; styles 3, slender and subulate with minutio terminal stigmas.
Fruit a tiny (2–3.5 × 2.5–3.5 mm), spheroidal or ovaloid, 3-angled, dry, indesiccant,
nut-like capsule with a brown and often rugose endocarp.

Southern Venezuela, Guyana, Amazonian Brazil; 8 species, 4 in Venezuela, all
in the flora area.
Key to the Species of Blepharandra

1. Stipules acute or acuminate at apex, deciduous before leaves; 500–2600 m

   1. Stipules rounded at apex, persistent on pedicel; 50–400 m

   2(1). Sepals, most bracteoles, and some bracts bearing gland-tipped marginal processes 0.5–2 mm long; leaves light green abaxially, not or only thinly glaucous; leaves, vegetative internodes, and abaxial surface of stipules glabrescent.......... B. fimbriata

   2. Sepals, bracteoles, and bracts entire or denticulate; leaves white or yellowish-glaucous abaxially; petioles, internodes, and abaxial surface of stipules at least initially densely hairy; leaf blades densely hairy to glabrate abaxially

   3(1). Petals all pink, turning white in age; sepals glabrous adaxially or sparsely sericeous near margin, sericeous abaxially; free lobes of petals 2.3–4 mm long; pubescence of inflorescence light to dark brown; pedicels 5–6(–7) mm long; blade of larger leaves 1.5–2 cm wide, the margin thick and nonrevolute

   3. Four lateral petals white, posterior petal pink; sepals densely sericeous on both sides; free lobes of petals 4–7 mm long; pubescence of inflorescence white; pedicels 6–10(–18) mm long; blade of larger leaves (2.5–3.5–7 cm wide, the margin thin and often revolute.. B. heteroptera


Much-branched shrub or small tree 1–6 m tall, stipules persistent on petiole, the free lobes 2.5–4 mm long, rounded; pedicels 7–12(–18) mm long; blade of larger leaves 4.5–7.5(–8) x 1.5–3 cm, elliptic or rectangular or narrowly obovate, thick and nonrevolute at margin; petals pink turning white in age. Savannas, usually on white sand, 100–400 m; Amazonas (base of Cerro Tapacuna, Rio Atabapo, Rio Casiquiare, Rio Guaira, Rio Orinoco, Rio Pasioni). Brazil (Amazonas: upper Rio Negro). — Fig. 74.


Weak shrub, prostrate to erect, to 2 m tall; vegetative internodes and leaves glabrous, except for tufts of hairs at nodes; stipules 11–30 x 4–7 mm, acute or acuminate at apex, deciduous before leaves; blade of larger leaves 5.5–8 x 1.7–3.9 cm, elliptic, not or only thinly glaucous abaxially, usually revolute at margin; some bracts, most bracteoles, and sepal glandular-fimbriate; 4 lateral petals white, posterior petal pale yellow. Open scrub and rocky places along rivers, 600–1800 m; Bolivar (near Canaima, Cerro Guajira, Uru-tepui). Guyana (Agyanana Plateau). — Fig. 76.


Shrub or tree 2–7 m tall; stipules persistent on pedicel, the free lobes 4–7 mm long, rounded; pedicels 6–8–12 mm long; blade of larger leaves 6–10 x 2.5–3.5–7 cm, elliptic or ovate, often revolute at margin; 4 lateral petals white, posterior petal pink. Shrubby vegetation or scrub forest on white sand, 50–400 m; Amazonas (Cerro Caroche, Cerro Moroco below San Fernando del Atabapo, Rio Atabapo, between upper Rio Orinoco and Cerro Autana, Rio Sipapo). Brazil (Amazonas: campos north and east of Manaus).


Shrub or small tree 1–8 m tall; vegetative internodes sericeous to glabrate; stipules 5–17–22 x 3–9 mm, acuminate at apex, deciduous before leaves; blade of larger leaves 4.5–15.5 x 3–9.5 cm, elliptic or ovate, abaxially glaucous and densely hairy to glabrate, bracts, bracteoles, and sepals entire or denticulate; 4 lateral petioles white, posterior petal pale yellow. Sandy upland savannas and shrubby associations, often along rocky streams, 500–2660 m; Bolivar (Auyantepui), Cerro Guayanas, Cerro Jaya, Cerro Manzana, Ilí-tepui, Macizo del Churuné, Piarí-tepui, upper Río Caroní, upper Río Paraguá, Sierra Pakaraima), Amazonas (Cerro Aracaumui, Cerro Duida, Sierra Utraria). Western Guyana, Brazil (Ama- nonas Sierra Araya). *Fig. 73.


Shrub or trees. Leaves usually bearing impressed glands abaxially on the blade; stipules distinct, borne on base of petiole. Inflorescence a pseudosorium, simple or less commonly ternate, axillary without vegetative leaves or terminating a lateral shoot with 1 pair of vegetative leaves; or both bracteoles often bearing 1(2) abaxial glands. Calyx bearing 8–10 often decurrent glands; petals yellow or whitish, glabrous. Stamens 10, usually glabrous; anthers ± a little. Gynococcus 2- or 3- carpellate; ovary with carpels connate and locules as many as carpels, every locule fertile; styles as many as carpels, distinct or partially to completely connate and then apparently only 1, stout, the large terminal stigma subacute or apparently capitate. Fruit an indehiscent "drupe" (actually a berry), yellow, orange, or red at maturity, with 2 or 3 distinct 1-seeded pyrenes in a common fleshy exocarp, each pyrene with a smooth, brittle, cortical wall.

Mexico, Central America, West Indies, South America (all countries except Chile and Uruguay); ca. 65 species, 11 in Venezuela, 6 of these in the flora area.

Key to the Species of Bunchosia

1. Inflorescence terminating a short lateral branch bearing a pair of sterile vegetative leaves (these sometimes deciduous, but leaving large leaf scars), or occasionally terminating a leaf-bearing main shoot; ovary glabrous or rarely sericeous, 2- or 3-carpellate .................................................. 2

2(1). Leaf blades abaxially densely velutinous or tomentose, the hairs dense on fully expanded leaves than on young leaves but almost always persistent and nearly uniformly distributed; fully expanded leaf blades 6–18–22 cm long; infructescences 4–12 cm long; bearing 10–30 flowers ........................................... B. mollis

2. Leaf blades from the beginning densely velutinous on margin and abaxially midrib but bearing only a few hairs on surface between, glabrescent in age? or with hairs present on margin; leaf blades up to 4 cm long; infructescence up to 3 cm long (in the only known collection, in which the

inflorescences are probably not fully elongated), bearing 8–12 flowers

3(1). Styles 5/1 to completely distinct ............................................................... 4

3. Styles connate, the stigmas distinct or connate ...................................... 5

4(3). Leaves persistently very densely sericeous or golden-sericeous abaxially, the epidermis completely concealed by hairs ........................................ B. argentina

4. Leaves sparsely sericeous abaxially to apparently glabrate ... B. armeniaca

5(3). Leaves thinly but persistently sericeous abaxially, undulate and cripitate at margin; pseudocarpaceae bearing 10–20 flowers, sometimes 2 in the axil of 1 bract; peduncles 2.5–5 mm long; style sericeous; dry fruits 20–28 x 15–20 mm, the wall smooth ........................................ B. glandulifera

5. Leaves nearly or quite glabrate, plane or slightly revolute at margin, Entirely or slightly indented near glands; pseudocarpaceae usually bearing 20–60 flowers, 1 per bract; peduncles 0.5–2 mm long; style glabrous; dry fruits up to 15 x 13 mm, the wall granulate ........ B. decussiflora


1. Shrub or tree (2–5–20–25 cm) tall; blade of larger leaves 10–20 x (5–7–14–14 cm, abaxially densely and persistently sericeous or golden-sericeous; pseudocarpaceae 7–13 cm long, with 15–35–50 flowers; another connects brown to red; ovary 2-carpellate, sericeous; styles distinct; fruits orange to red, 12–30 x 12–25 mm (dried), a persistently sericeous. Evergreen lowland forests, 290–400 m; Belèver (Rio Nane). Arariri- gua, Ariau, Barinas, Distrito Federal, Fal- cón, Lara, Mérida, Miranda, Monagas, Por- tuguesa, Táchira, Yaracuy; Costa Rica, Panamá, Colombia, Guyana, French Guiana, Ecuador, Peru, Brazil. Fig. 76.

2. There is great diversity in the plants to which this name has been applied; they may represent more than one species.

Bunchosia armeniaca (Cav.) DC., Prodr. 1: 582. 1824. —Malpighia armeniaca Cav., Diss. 6: 410. 1828. 1789. —Palo de cedro de Venezuela.

Tree 3–15 m tall; blade of larger leaves 10–20 x 5–10 cm, abaxially sparsely sericeous to nearly glabrate; pseudocarpaceae 6–17 cm long, with 8–60 flowers; another connects dark red to black; ovary 2-carpellate, densely sericeous, styles at least 3/4 distinct, glabrous or proximally sericeous; fruits reddish, 12–19 x 14–17 mm (dried), a persistently sericeous. Wet forests, 50–300 m; Delta Amacuro (west of Caño Guayo and east

of Caño Sabanqu, Rio Cupiuy, town of Si- erra Imataca southeast of Las Castil- los), northern Bolivar (El Dorado, El Palmar, Pijigaos, Rio Caras). Colombia, Ecuador, Peru, Brazil. It is unlikely that everything passing under this name represents the same species. The styles are not always distinct in plants from Ecuador; but in Venezuela the character seems to be consistent.


1. Shrub or tree 3–25 m tall; blade of larger leaves 12–19 x 4.5–10 cm, glabrate at maturity; pseudocarpaceae 8–15 cm long, with 20–60 flowers; peduncles 0.5–2 mm long; another connects brown or reddish; ovary 3-carpel- larte, sericeous; style (from 2 connate) glabrous; fruits yellow or reddish, 9–15 x 9–16 mm (dried), glabrate and granulate at maturity. Evergreen lowland to upper montane moist forests, 100–1300 m; northern Amazonas (Raudal) de los Guacharos) and upper Río Orinoco, Río Ucayali, Sierra de la Bólfida). Guyana, French Guiana, Brazil.


1. Shrub or small tree 2–4 m tall; blade of larger leaves 5–18 x (4.5–10–12 cm, abaxially undulate and cripitate at margin, abaxially
thinly but persistently serious; pseudo-
rosette 5–11 cm long, with 10–20 flowers;
the bracts sometimes subtending 2 flowers;
peduncles 2.5–5 mm long; anthr con-
nectives yellow or light brown; ovary 2-cep-
pellate, sericeous; style (from 2 connate) 3–
3.5 mm long, sericeous; fruits orange to red,
20–20×15–20 mm (dried), beaked, the wall
smooth, glabrate at maturity. Secondary
woody, edges of forest, 50–100 m: Amazonas
(La Esperanza, Pumichin, Puerto Apurecho,
San Antonio del Sipapo, San Carlos de Rio
Negro) Anzoategui, Aragua, Barinas, Caru-
bebo, Distrito Federal, Guárico, Miranda,
Portuguesa, West Indies, Colombia, Sturi-
nana, Ecuador, Peru, Brazil, Bolivia.

**Bunchonia glandulifera** has a very large
fleshy red-orange fruit. It is widely cul-
vated for its handsome foliage and showy ed-
ible fruits. It is known only as an introduced
tree in the West Indies, Peru, Brazil, and Bo-
livia, and seems likely to be native only in
Colombia and Venezuela. Its wide distribu-
tion in northern Venezuela suggests that
these may be natural populations. None of
the collections I have seen from northern
Venezuela were described as cultivated, but
the possibility remains that in a long-settled
area like the District Federal (the type loca-
ity) the species was introduced early (per-
haps before the arrival of Europeans) and
then became naturalized through dispersal
by birds. Most, but not all, of the collections
from Amazonas were described by the collec-
tors as cultivated. It seems unlikely to me
that this showy species is indigenous to
southern Venezuela; I would expect it to be
better collected there if that were the case.

**Bunchonia mollis** Benth., London J. Bot. 7:
127. 1868. — Ciruela de fraile, Ciruela
monteatera.

**Bunchonia rhombifolia** Turra., Bull. Soc. Imp.
Naturalistas Mosc. 36: 592. 1863.

**Bunchonia schomburgkiana** Nied., Arbei-
ten Bot. Inst. Königin Luise Honnemann
Braunschweig 5: 45. 1914.

Shrub or small tree 1–5 m tall; blade of
large leaves 6–18 (–20) × 5–12 cm, abaxially
uniformly densely velutinous or tomen-
toso, the T- or Y-shaped hairs stellate at base
of stalk; inflorescence terminating a lateral
shoot with 1 pair of full-sized leaves, 4–12
mm long beyond leaves, with 10–30 flowers;
very glabrous or very rarely sericeous, 2- or
3-carpellate; styles distinct or up to ½ con-
nate; fruits orange to red, 6–11 mm diameter
(dried), glabrous. Savannas, scrub forest, gallery forest, near sea level to 300 m; com-
mom in northeastern Bolivia. Amazonas, Barinas, Guárico, Miranda, Monagas, Nueva
Esperanza, Sucre, Guyana, Brazil (Roraima).

**Bunchonia petraea** W.R. Anderson, Contr.

Shrub 1.5 m tall; blade of larger leaves
(not fully expanded?) 3–4 × 1.5–2 cm,
vellutinous on margins and abaxial midrib,
some hairs with sharp spurs at base of very
short stalk; inflorescence terminating a lat-
eral shoot with 1 pair of full-sized leaves, up
to 3 cm long (not fully elongated?), with 8–12
flowers; very glabrous, 2- or 3-carpellate;
styles distinct; fruits unknown. Granitic out-
crops, 50–100 m; Amazonas (Puerto Ay-


Shrubs or trees. Leaves bearing axilary glands; stipules intra- and epipetiolar,
completely connate, the pair 5–11 mm long, coriaceous, persistent on petiole. Inflo-
rescence terminal, single or 2 or 3 together, each usually divided near base (to 3–5)
axil, each axis a raceme of short cincinni; lowest bracteole and alternate subsequent
bracteoles bearing 1 large eccentric axillary gland. Flower buds spheroidal. Sepals
all biglandular; petals pink or white; posterior petal bearing 2–4 large glands on
each side of base of limb and several smaller glands distally; Stamens 10, glabrous;
anthers rounded at apex, often excrusted at apex by the thick, fleshy connective.
Ovary of 3 completely connate carpels, 3-locular but 1 of the posterior locules empty
and smaller; styles 5, slender and subulate; stigmas slightly internal and decurrent.
Fruit an indehiscent fibrous or aerenchymatous nut, dry at maturity and without
a stony endocarp, usually containing only a locule completely filled by 1 large seed.
Amazonian Colombia, Venezuela, Guyana, Peru, Brazil; 2 or 3 species, 2 in Venezuela, both in the flora area.

The third species of *Burdachia*, if it is recognized, is *B. duchei* Steyer, which occurs along the Río Negro in Amazonian Brazil between Barcelos and the Río Urubú. It is a segregate from *B. prismatocarpa*.

Key to the Species of *Burdachia*

1. Fruits pyramidal, bearing 8 or 9 longitudinal ribs, these extended at base into knobs or spurs; leaves minutely sericeous or tomentose abaxially to glabrate, with some hairs usually persisting on midrib; vegetative stems sessile to glabrate; stipules abaxially sericeous to glabrate; peduncles sparsely to densely sericeous; ovary conical or... *B. prismatocarpa*

1. Fruits conical to spherical, round in cross section, the wall smooth; leaves and vegetative stems glabrous; stipules abaxially glabrous; peduncles glabrous or with a few hairs in a line; ovary depressed-globose

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Shrub or tree 2–15 m tall; blade of larger leaves 10–21–25 × (3–14–13–14) cm; fruits 9–20 × 7–17 mm. Along lowland rivers, 50–120 m; Bolivar (Cerro Maracay, Río Grande near Ciudad Bolivar, Río Paragua), Amazonas (basins of upper Río Negro and upper Río Orinoco). Aripo (Río Meta); Amazonian Colombia, Peru, Brazil. *Fig. 77.*

Plants from Amazonas between San Fernando de Atalaia and Piedra Coja tend to have leaves < 6 cm wide, stipules only 3–5 mm long, a glabrous ovary, and fruits < 13 mm long, whereas elsewhere the leaves are mostly wider, the stipules are 6–10 mm long, the ovary is densely tomentose, and the fruits are mostly 14–20 mm long. The narrow-leaved form has been named *Burdachia williamsii*, which I recognized in 1981. However, specimens that resemble the character states of these two taxa continue to accumulate. For example, *Davidse 27784* (MICH, MO) and *27833* (MICH, MO, VEN) are *B. williamsii* with wide leaves; *Lawson 4619* (MICH, MO, VEN), *Stergiou & F. Stergiou 11928* (MICH, MO, NY, VEN), and *Stergiou et al. 11641* (MICH, VEN) are *B. williamsii* with a hairy ovary; *Maguire & C. Maguire 35522* (MICH, NY, US, VEN) and *Davidse & González 16986* from Aripo (MICH) are *B. prismatocarpa* with short stipules and fruits. Because of this variation I have decided to abandon *B. williamsii* as indefensible.

I have given the name *Burdachia prismatocarpa* var. *lenticulata* W.R. Anderson to plants from Loreto, Peru, and adjacent Brazil. Given the variation discussed above, it may be that this variety will not continue to merit recognition. If it is recognized, the plants of Venezuela should be called *B. prismatocarpa* var. *prismatocarpa*.


Shrub or tree 3–15–20 m tall; blade of larger leaves (8–10–24 × 5–11–13) cm; fruits 16–20 × 13–18 mm. Lowland primary and secondary forests, usually on the banks of rivers or streams or in periodically flooded areas, 50–100 m; Amazonas (Rio Casiquiare, San Carlos de Río Negro). Guyana, Brazil (Amazonas, Pará). *Fig. 78.*
The type of Tetrapodocarpus glandifer came from the Amakura River, on the border between Guayanas and Delta Amacuro, so the species must surely occur in Delta Amacuro too. In 1981 I recognized the plants of western Amazonas as Burdachia sphaerocarpa var. sphaerocarpa and those of Guayana as B. sphaerocarpa var. glandifer, on the basis of an apparent difference in petal color; pink in the west and white in the east. Subsequently collectors have described the petals of some western populations as white, and others seem to be no justification for recognizing two taxa within this species.


Trees, shrubs, or subshrubs. Leaves eglandular; stipules intra- and epipetalar, distinct or partially to completely connate, persistent on petiole in most species. Inflorescence terminal, a raceme of few-flowered cinerea or a pseudocorymb (i.e., a raceme of 2-flowered cinerea); glabrous bracts and bracteoles glabrous; pedicels sessile or sometimes raised on a short peduncle. Sepals all biglandular or all eglandular, connate as far as tips of glands, the glands green, yellow, white, or pink; petals yellow, white, pink, or red, glabrous in most species; lateral 4 petals with slender recurved claw, the anterior pair with deeply cup-shaped limbs, the posterior pair shorter; posterior petal with a stout, erect claw and the limb smaller, flat or crumpled and often reflexed. Stamens 10, the anthers a sile. Ovary with 3 carpels completely connate, 3-locular, all locules fertile or the anterior sterile in some species; styles 3, slender and subulate, the stigma minute and terminal or slightly internal. Fruit a drupe, the thin flesh green turning yellow, orange, red, purple, blue, or blue-black at maturity, the stone with a hard surface. 3-locular.

Mexico, Central America, West Indies, South America (all countries except Chile, Argentina, and Uruguay); at least 15 species, 34 known or expected in Venezuela, 40 of these in the flora area.

Key to the Species of Byronsina

1. Pedicels long-pedunculate, the primary peduncle 5–15 mm long; petals yellow; anthers glabrous
   2. Pedicels sessile or short-pedunculate, the peduncle 0–3 mm long; petals white, pink, or red, if yellow the anthers mostly serious or tomentose or on sides of locules
   2(1). Stipules distinct (Caution: This refers to the pair of stipules borne on the adaxial face of a single petiole, best viewed by removing the petiole, to which the stipules will remain attached. In a few species two stipules from opposite petioles are short-connate across the node, but that is not the connation to which this couplet refers); petals white, pink, or red, often changing from white to pink or red with age; anthers glabrous, ovary and fruit glabrous; bracts and/or bracteoles persistent or to persist maturity of fruit
   3. Stipules ½ to completely connate beyond petiole; petals white, pink, red, or yellow; anthers glabrous or hairy; ovary and fruit glabrous or hairy; bracts and bracteoles persistent or deciduous
   3(2). Vegetative internodes, adaxial surface of stipules, petioles, and adaxial surface of leaf blades at least initially hairy, the hairs persistent or deciduous
   3

3. Vegetative internodes, adaxial surface of stipules, and leaves quite glabrous from the beginning except for short-bristate axes of stipules
   (Caution: Do not confuse axis of inflorescence with vegetative internodes)

3(3). Leaf blades with lateral veins very numerous and fine, not or hardly distinguishable from parallel veins and reticulum; flowers borne 1 per bract

3(4). Leaf blades with principal lateral veins easily distinguished from finer veins and reticulum, usually 7–18 pairs, sometimes more in blades over 10 cm long; flowers borne 1–3 per bract

4(5). Anther locules 1.8–3.1 mm long, cylindrical and unwinged or rarely bearing

5. Leaf blades narrowly elliptic, 1.5–3.8 cm wide, abaxially often persistently glabrous, the margin green; sepals revolute in anthesis; anther connective exceeding locules by 0.5–0.8 mm

6. Leaf blades elliptic or obovate, 3–5 cm wide, not glabrous abaxially, the margin yellow; sepals appressed in anthesis to eventually revolute; anther connective exceeding locules by 0.2–0.5 mm

7(6). Leaf blades abaxially persistently pubescent, the hairs on tissue between veins erect, a straight, basified, the hairs on veins denser, twisted, sub-basified... B. cuprea

7. Leaf blades abaxially glabrous or sparsely tomentose to glabrate between veins, tomentose to glabrate on principal veins, most densely so on midrib

8(7). Blade of larger leaves 8.5–14.5 x 4–8 cm, the petiole 10–19 mm long; stipules 3.5–7(–8) mm long, often acuminate; reticulum usually concolorous with areola tissue; inflorescence 9–18 cm long

8. Blade of larger leaves 5–9(×10.5) x 3.4–5.5 cm, the petiole 5–11 mm long; stipules 1.5–2.5(–3) mm long, acute or obtuse; fine reticulum visible in dried leaves) abaxially or, usually, on both sides as a white mesh against darker areoles; inflorescence 5–10–12.5 cm long

9(8). Petioles slightly shorter than stipules to slightly longer, never twice as long

9. Petioles at least twice as long as stipules, often longer

10(9). Pedicels distally thickened, 2–3 mm diameter at apex, straight in bud; anther locules 1.6–2.2 mm long, the connate not or hardly exceeding them, by up to 0.1 mm; westernmost Bolivar

10. Pedicels up to 1 mm diameter in flower, 1.5 mm in fruit, circinate in bud; anther locules 1.3 mm long, the connate exceeding them by 0.1–0.5 mm; westernmost Bolivar and eastern Amazonas... B. steyermarkii
11(9). Pedicels decurved to eventually twisted in old flowers and fruits .................................. 12
11. Pedicels ascending in old flowers and fruits ................................................................. 13
12(11). Leaf blade with the abaxial epidermis deeply pitted, densely and persistently glaucous; B. lutescens
12. Leaf blade abaxially nearly or quite smooth and not or hardly glaucous ........................................ 14
13(11). Pedicels becoming sigmoid in maturing fruits; pedicels 18–22–33 mm long; blade of larger leaves (11–12,5–17,5 x (5–9,5–8,5 cm) ........................................................................ 16
13. Pedicels straight or curved but not sigmoid in fruits; pedicels 5–17 mm long; blade of larger leaves 3–11–13,5 x 1,5–6,5 cm .................................................................................... 14
14(13). Pedicels straight in bud, 2,5–3 mm long in flower, 6–7 mm long and 1,5–2 mm diameter in fruit; another locules cylindrical and unwinged; sepals appressed in anthesis, not or only slightly revolute in fruit; stone of fruit apparently smooth; blade of larger leaves 3–5,5 x 1,5–3,5 cm ........................................................................ 16
14. Pedicels cicatrice in bud, 5–11 mm long in flower, 7–12 mm long and 0,7–1,5 mm diameter in fruit; another locules with the outer thecae dorsiventrally flattened and bearing narrow membranous longitudinal wings; sepals revolute at apex in anthesis, reflexed and revolute in fruit; stone of fruit rugose; blade of larger leaves (4,5–6–11–13,5) x (2,5–3,4–4,5 cm) ........................................................................ 15
B. concinna
15(2). Specimen with flowers ................................................................. 16
15. Specimen with fruits .................................................................................................................. 16
16(15). Petals yellow, sometimes turning orange or red with age ............................................ 17
16. Petals white, pink, or red, often changing from white to pink or red with age ....................... 20
17(16). Gnarl shrubs up to 60 cm tall; leaves mostly in dense clusters without measurable internodes .................................................................................................................. 16
18(17). Leaf blade abaxially thin to densely velutinous, the hairs with ± straight, erect stalk, the branches mostly ± stalk ........................................................................ 21
18. Leaf blades abaxially tomentose, tomentose, or glabrate, the hairs of any sessile, sub sessile, or with a stalk much shorter than cressippi or branches ......................................................... 21
19(18). All or many hairs of abaxial surface of leaf blades stellate, i.e., with 2 branches; stipules (8)–10–25 mm long, deciduous .................................................................................... 19
19. All hairs of leaf blades bifurcate, i.e., Y-shaped with only 2 branches; stipules 4–8 mm long, persistent on petiole ............................................................................................................ 20
20(19). Leaf blades ± strongly revolute at margin and persistently velutinous adaxially over entire surface; sepals adaxially tomentose; ovary and fruit very densely and persistently hairy over entire surface, the hair subappressed to suberect; bracts and bracteoles mostly persistent during maturation of fruit ........................................................................ 21
20. Leaf blades flat or only slightly revolute at margin, soon glabrescent; adaxially or persistently velutinous or tomentose on midrib and sometimes on lateral veins; sepals adaxially glabrous; ovary and fruit glabrous or sparsely tomentose at apex; bracts and bracteoles deciduous before maturity of fruit ........................................................................ 20

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21(18). Posterior petal with 2 or more glands at apex of claw or occasionally on base of limb ................................................................................................................................. 22
21. Posterior petal eglandular ..................................................................................................... 23
22(21). Ovary glabrous or very sparsely sericeous at apex; leaf blades abaxially ± persistently suberectose or appressed-tomentose, the hairs distinctly stalked, with slightly twisted, nonparallel crossepices > 0,5 mm long; leaf blades with 8–12 pairs of lateral veins strongly raised abaxially, parallel and anastomosing near margin, alternating with weaker, shorter, parallel veins; bracts or small trees 2–9 m tall ........................................................................................................ 24
22. Ovary sericeous; leaf blades abaxially appressed-sericeous to glabrate, the hairs sessile or sub sessile, with short, straight, parallel crossepices up to 0,5 mm long; leaf blades with 15–20 or more pairs of fine lateral veins parallel and anastomosing near margin, none very prominent abaxially; trees 3–20 m tall ........................................................................................................................................ 24
23(22). Leaf blades abaxially tomentose to glabrate, the hairs ± twisted, not parallel, not or only moderately appressed; petiole of larger leaves 6–13 (–19) mm long ........................................................................................................ 24
23. Leaf blades abaxially densely to sparsely sericeous or nearly glabrate, the hairs straight, appressed, and parallel; petiole of larger leaves (15–20)–40 mm long ........................................................................ 24
24(23). Leaf blades abaxially densely and persistently rusty brown-sericeous, occasionally belatedly glabrescent, the hairs 0,2–0,5 mm long; Delta Amacuro and eastern Bolivar ........................................................................................................ 24
24. Leaf blades abaxially sparsely sericeous to nearly glabrate, the hairs 0,1–0,2 mm long, never dense enough to hide epidermis; northwestern Bolivar and Amazonas ........................................................................................................ 24
25(16). Anthers hairy .................................................................................................................. 26
25. Anthers glabrous ................................................................................................................. 31
26(25). Leaves sessile or sub sessile, the petiole up to 2 mm long ............................................ 26
26. Leaves petiolate, the petiole of larger leaves at least 5 mm long ........................................ 27
27(26). Another locules rounded or acute at apex; bracts at least 3 mm long, mostly deciduous before maturity of fruit ........................................................................................................ 28
27. Another locules extended at apex into slender, sterile projections; bracts up to 1,9–2,2 mm long, persistent in fruit or some persistent and some deciduous in the same inflorescence ........................................................................................................ 29
28(27). Larger leaves with petiole 5–10 mm long, densely and ± persistently tomentose, the blade (5–7,5–15 x (3–4–7 cm); another 1,5–2,8 mm long, the leaf blades sparsely to moderately tomentose with ± spreading and often twisted hairs that do not reach bulbous apex of connective; ovary glabrous; styles 2,1–3,7 mm long ........................................ 28
29. Larger leaves with petiole (5–15–32 x 6–22–5 cm); another 1,5–2,8 mm long, the leaf blades very densely hisurate their whole length with straight, appressed, parallel hairs that often reach as high as tapered apex of connective beyond; ovary densely sericeous on distal half; styles 4,5–6,5 mm long .................................................................................. 29
29. Blade of larger leaves 5–8 x 3–4 cm; lateral veins and reticulum barely or
29. Blade of larger leaves 9–18.5 x 3.5–7.5 x 0.8–5 cm; lateral veins and reticulum generally visible on one or both sides of dried leaf blades; basins of middle Rio Orinoco west and south to upper Rio Negro. B. dubio

30(1). Leaves glabrous or thinly sericeous or glabrate on petiole and abaxial surface of blade, the hairs (if present) quite straight and very strongly appressed; peduncles 0–0.5 mm long; bracts 0.5–1.5 mm long. B. papuensis

30. Leaves persistently appressed-tomentose or loosely subsericeous on petiole and abaxial surface of blade, or patchily glabrescent in age, the hairs amious to twisted, appressed to erect; peduncles 0–3 mm long in the same inflorescence, mostly 0.5–2 mm long; bracts 1.2–1.5 x 0.5–2 mm long. B. basiliana

31(25). Ovary sessile. B. coriacea

31. Ovary glabrous. B. tenuior

32(31). Fruits and bracteoles persistent past maturity of fruit; bracts 0.7–2 x 0.2–1 mm long, < bracteoles; flowers often borne 2(3) per bract; all 3 locules if ovary fertile. B. christiaenii

32. Bracts and bracteoles all or mostly deciduous before or during anthesis; bracts 2.5–7 mm long, usually longer than bracteoles; flowers borne 1 per bract; only 2 locules of ovary fertile. B. carrauana

33(32). Leaf blades thinly to moderately sericeous abaxially with hairs not dense enough to completely conceal epidermis, sometimes eventually deciduous. B. cocoxii

33. Leaf blades very densely and persistently sericeous or subsericeous abaxially, the hairs so dense as to completely conceal epidermis, even on older leaves. B. dimorpha

34(33). Inflorescence 5–16 cm long; stipules 2.5–3.8 mm long; petioles 13–20 mm long; blade of larger leaves 6.5–12.5 x 3.3–7.5 cm; eastern Bolivia. B. chlorolepis

34. Inflorescence 18–28 cm long; stipules 4.5–9 mm long; petioles 20–22 mm long; blade of larger leaves 11–17 x 5.5–9 cm; Amazonas. B. macrostachya

35(31). Lateral petals adaxially pilose on claw, abaxially pilose on limb; stipules 6–11 mm long, completely and smoothly connate, the pair rounded at apex. B. tiliifolium

35. Petals glabrous; stipules 1.5–7.5 mm long, if ≥ 6 mm the pair triangular, acute at apex, sulate in middle. B. anitissima

36(35). Leaf blades abaxially persistently dark brown-tomentose at maturity, the hairs very strongly twisted and so dense as to completely hide epidermis. B. haberi

36. Leaf blades abaxially glabrous or glabrate at maturity or, if persistently hairy, the hairs with nearly straight branches and never so dense as to completely hide epidermis. B. elongata

37(36). Anthers with apex of connective about even with locules or exceeding them by no more than 0.3 mm. B. angustifolium

37. Anthers with connective much enlarged at apex, exceeding locules by 0.7–1.6 mm. B. iturupense

38(37). Leaf blades with lateral veins very numerous and fine, not or hardly distinguishable from parallel veins and reticulum; petioles 8–18–23 mm long; sepals abaxially glabrous or ciliate on margin and rarely bearing scattered hairs; hairs on filaments straight; fruit superior throughout development. B. dimorpha

38. Leaf blades with principal lateral veins easily distinguished from finer veins and reticulum, usually 5–8 pairs; petioles 2–6 mm long; sepals abaxially sericeous; hairs on filaments kinkly; fruit developing half-immersed in enlarged, disk-like receptacle. B. nitidissima

39(37). Bracts and bracteoles persistent through anthesis and past maturity of fruit. B. coriacea

40(39). Bracts and bracteoles all or mostly deciduous before or during anthesis. B. bracteolata

41(40). Pedicels decurved in old flowers and fruit; styles strongly bent in bud, a straightening during anthesis; stipules 1.7–4 x 0–5 mm long; calyx glands mostly absent or rudimentary, rarely well developed. B. wurdackii

41. Pedicels straight or bent upward in old flowers and fruit; styles nearly or quite straight in bud; stipules 4–7.5 mm long; calyx glands well developed. B. cassiusii

42(41). Bracts and/or bracteoles persistent to or past maturity of fruit. B. bracteata

42. Bracts and bracteoles all or most deciduous before maturity of fruit. B. burckii

43(42). Leaves sessile or subsessile, the petiole up to 2 mm long. B. persica

43. Leaves petiolate, the petiole at least 4 mm long. B. persica

44(43). Leaf blades abaxially abaxially glabrous or very soon quite glabrate; stipules 1–2 mm long; fruits quite superior throughout development. B. occidentalis

44. Leaf blades abaxially sericeous or velutinous to glabrescent; stipules 2–5 mm long; fruits developing half-immersed in enlarged, disk-like receptacle. B. cocoxii

45(44). Bracts 3–5 times as long as bracteoles, strongly reflexed or revolute. B. dimorpha

45. Bracts up to twice as long as bracteoles, sometimes the same length or shorter, appressed or spreading or somewhat reflexed. B. dimorpha

46(45). Leaf blades densely velutinous on both sides, the hairs Y-shaped with a straight, erect stalk, the branches mostly shorter than stalk; leaf blades ± strongly revolute at margin; fruits persistently hairy over entire surface with hairs subappressed to suberect. B. longifolius

46. Leaf blades sericeous or glabrate, the hairs (if any) sessile or subsessile, straight, appressed; leaf blades flat at margin; fruits prostrally glabrescent, distally sericeous to glabrate. B. cocoxii

47(46). Leaf blades densely and persistently rusty brown-sericeous abaxially, occasionally belatedly glabrescent, the hairs 0.2–0.5 mm long; Delta Amacuro and eastern Bolivar. B. acutus

47. Leaf blades sparsely sericeous to nearly glabrate abaxially, the hairs 0.1–0.2 mm long, never dense enough to hide epidermis; northwestern
Bolivair and Amazonia .................................................. B. crispa

48(45). Leaf blades persistently dark brown–tomentose abaxially at maturity, the hairs very strongly twisted and so dense as to completely hide epidermis .................................................. B. huberi

48. Leaf blades glabrous or glabrate abaxially at maturity or, if persistently hairy, the hairs not dense enough to completely hide epidermis .................................................. 49

49(48). Fruits developing half-immersed in enlarged, disk-like receptacle .................................................. B. nitidolatina

49. Fruits nearly to quite superior throughout development .................................................. 50

50(49). Sepals membranous in fruit, the portion beyond glands elongating to form a lingulate process at least twice as long as wide ............. B. schomburgkiana

50. Sepals = coriaceous in fruit, the portion beyond glands often somewhat acuminate but triangular, about as wide as long, often auriculate at base .................................................. 51

51(50). Pedicels straight or slightly nodding in fruit .................................................. 52

51. Pedicels strongly decurved and/or twisted in fruit .................................................. 55

52(51). Dried fruits 4.6–9.2–20 mm diameter; leaf blades with lateral veins very numerous and fine, not or hardly distinguishable from parallel veinslet and reticulum .................................................. B. contiphylla

52. Dried fruits (4.6–9.2–20 mm diameter; leaf blades with principal lateral veins ± easily distinguished, usually 7–13 pairs) .............. 53

53(52). Blade of larger leaves 6.5–10.7 cm long; pedicels 2.5–6 mm long; bracts 2.5–7 mm long; fruits probably dark green or blue at maturity; 1400–2000 m .................................................. B. katirona

53. Blade of larger leaves mostly 9–32 cm long; pedicels 6–10(–13) mm long; bracts 0.5–2(–2.5) mm long; fruits yellow, orange, or red at maturity; 30–850 m .................................................. 54

54(53). Blade of larger leaves 3.5–7.5(–8) cm wide; stipules 1.5–3(–4.5) mm long; fruits red at maturity, 10–16 × 10–12 mm (dried); flowers 1 per bract; basins of middle Rio Orinoco west and south to upper Rio Negro .................................................. B. japonensis

54. Blade of larger leaves (6–)7–15 cm wide; stipules 3–5 mm long; fruits yellow or orange at maturity, 15–20 mm diameter (dried); flowers 1 per bract or more often a cluster of 2–3, expected in easternmost Bolivar .................................................. B. christiana

55(51). Bracts (2.5–)3–5(–7) mm long; bracteoles 2–3 mm long; bracts 6–11 mm long, generally as long as petiole or longer, occasionally slightly shorter; flowers borne 1 or (3)7) per bract .................. B. suliflora

55. Bracts and bracteoles 0.5–2 mm long; stipules 1.5–4.5 mm long, always much shorter than petiole, never as much as half as long; flowers borne 1 per bract .................................................. 66

56(55). Blade of larger leaves 5–8 × 3–4 cm; lateral veins and reticulum mostly not visible in dried leaf blades; Gran Sabana, Bolivar .................................................. B. cubin

56. Blade of larger leaves 9–18.5 × 3.5–7.5(–8) cm; lateral veins and reticulum generally visible on one or both sides of dried leaf blades; basins of stipules completely and smoothly conate .................................................. 65

57(56). Leaves glabrous or thinly sericeous to glabrate on petiole and abaxial surface of blade, the hairs (if present) quite straight and very strongly appressed; peduncules 0.5–6 mm long; bracts 0.5–1(–1.5) mm long .................................................. B. papuensis

57. Leaves persistently appressed-tomentose or loosely subsericeous on petiole and abaxial surface of blade, or patchily glabrescent in age, the hairs sinuous to twisted, appressed to erect; peduncles 0.5–3 mm long in the same inflorescence, mostly 0.5–2 mm long; bracts 1.2–1.5–(2) mm long .................................................. B. basiliana

58(42). Canalled shrubs up to 60 cm tall; leaves mostly in dense clusters without measurable internodes .................................................. B. verbascifolia

58. Shrubs or trees 1–35 m tall; internodes mostly > 5 mm long, if shorter the plant at least 2 m tall .................................................. 69

59(58). Leaf blades thinly to densely velutinous abaxially, the hairs with a straight, erect stalk, the branches mostly ± stalkless .................................................. 60

59. Leaf blades tomentose, sericeous, glabrate, or glabrous abaxially, the hairs if present sessile, subsessile, or with a stalk mostly ± stalkless; main branches .................................................. 61

60(59). All or many hairs of abaxial surface of leaf blades stellate, i.e., with > 2 branches; stipules (8–)10–25 mm long, deciduous ............. B. stipeanus

60. All hairs of leaf blades infurate, i.e., Y-shaped with only 2 branches; stipules 4–8 mm long, persistent on petiole .................................................. B. peocipigiana

61(59). Leaves sessile or subsessile, the petiole up to 2 mm long; leaf blades usually rounded or cordate at base .................................................. B. cocconalis

61. Leaves petiolate, the petiole at least 5 mm long; leaf blades tapered, ovate, or rounded at base .................................................. 62

62(61). Sepals membranous in fruit, the portion beyond glands elongating to form a lingulate process at least twice as long as wide; B. schomburgkiana

62. Sepals ± coriaceous in fruit, the portion beyond glands often somewhat acuminate but triangular, about as wide as long, often auriculate at base .................................................. 63

63(62). Pedicels nearly or quite straight, or ascending, in fruit .................................................. 64

63. Pedicels strongly decurved or twisted in fruit .................................................. 69

64(63). Leaf blades abaxially nearly or quite glabrate as soon as expanded, with at most some appressed hairs persistent on midrib; fruit quite glabrous .................................................. 65

64. Leaf blades abaxially thinly to densely sericeous or subsericeous, the hairs persistent or eventually deciduous; fruit derived from a densely sericeous ovary and often bearing some hairs at maturity, especially at apex .................................................. 66

65(64). Bracts subtending only 1 flower, very rarely 2; inflorescence 0–15 cm long; stipules 1.5–2.5 mm long; blade of larger leaves 8–15 × 3–7 cm .................................................. B. frondosa

65. Bracts (all or at least some in every inflorescence) subtending 2–4 flowers; inflorescence 15–35 cm long; stipules 4–7.5 mm long; blade of larger leaves 15–25 × 7–13 cm .................................................. B. cossbei

66(64). Stipules Rio Orinoco west and south to upper Rio Negro .................................................. 65

66. Stipules mostly incompletely connate, the pair sulcate and shallowly to
deeply bidentate at apex .......................................................... 67

67(66). Leaf blades thinly to moderately seriously abaxially with hairs not dense enough to completely conceal epidermis, sometimes eventually deciduous ........................................... B. carnosoides

67. Leaf blades very densely and persistently serious or subsericeous abaxially, the hairs so dense as to completely conceal epidermis, even on older leaves ........................................... 68

68(67). Inflorescence 5–16 cm long; stipules 2.5–3.8 mm long; petals 12–20 mm long; blade of larger leaves 6.5–12.5 × 3.8–7.5 cm, eastern Bolivia ........................................... B. chalcoaphila

68. Inflorescence 18–26 cm long; stipules 4.5–9 mm long; petals 20–28 mm long; blade of larger leaves 11–17 × 5.0–9.0 cm, Amazonas ...... B. macrostachya

69(63). Leaf blades with 15–20 or more pairs of fine lateral veins, none very prominent ......................................................... B. sipacta

69. Leaf blades with 5–12 pairs of principal lateral veins ........................................................................................................... 70

70(69). Leaf blades glabrous from the beginning or very soon becoming glabrous, petiole of larger leaves 15–48 mm long ........................................... 71

70. Leaf blades subsericeous to densely tomentose with hairs persistent or eventually mostly deciduous; petiole of larger leaves 5–15 mm long ........................................... 71

71(70). Fruits (dried) 12–17 × 10–16 mm, persistently sericeous at apex; calyx gland well developed ............................................... B. fernandezii

71. Fruits (dried) 6–7 mm diameter, quite glabrous; calyx glands mostly absent or rudimentary, rarely well developed ........................................... B. uvarochia

72(70). Blade of larger leaves 5–6.8 cm long, broadly obtuse to rounded at apex, abaxially rugose, abaxially persistently tomentose with hairs so dense as to completely hide epidermis, even on older leaves ........................................... B. koberi

72. Blade of larger leaves 6.5–17.9 cm long, usually acute or acuminate at apex, sometimes narrowly obtuse, abaxially smooth or with veins slightly raised, abaxially tomentose or subsericeous to glabrescent, hairs seldom so dense as to completely hide epidermis, especially on older leaves .................................................. 73

73(72). Fruits red at maturity, ovoid with a prominent apical beak ........ B. basiliana

73. Fruits yellow at maturity, somewhat ovoid when young but nearly glabrous at maturity ................................................................................. 74

74(73). Sepals loosely sericeous abaxially; leaf blades elliptic, 3–8.5 cm long as wide, persistently loosely subsericeous or appressed-tomentose abaxially; only rarely glabrescent in age ........................................... B. pachypoda

74. Sepals usually glabrous abaxially; leaf blades mostly broadly elliptic to suborbund, 1.4–2 times as long as wide, mostly glabrescent abaxially in age, often patchily glabrescent, occasionally persistently tomentose ........................................... B. serrulata


Byrsomima ferruginea var. macrophyla (Beith, London J. Bot. 7: 119; 1928, 1929.

Tree (4–)15–45 m tall; stipules 2.5–4.5 mm long, completely conuate; petals 15–20-40 mm long, blade of larger leaves 11–22(–25) × 4–8(–11) cm, densely and persistently rusty brown-serious abaxially; occasionally basally glabrescent; bracts and bracteoles persistent or deciduous in fruit; bracts 2.5–5.5 nn long, strongly reflexed or revolute; bracteoles 0.6–1.5 mm long; peduncle nearly or quite straight, or ascending, in fruit; petals yellow, the posterior petal eglandular; anthers sericeous, especially between locules, the connate equaling locules or exceeding them by up to 0.6 mm; ovaly densely sericeous; fruit yellow, 10–13 mm diameter (dried), sericeous to glabrate. Evergreen lowland to lower montane forests, 200–1900 m; Delta Amacuro (Caro Aicorina, east-northeast of El Palmar, east-northeast of Ilan to), widespread in eastern Bolivia to 63°W Guyana, Suriname, French Guiana, Brazil (Beira). Fig. 85.

This species is close to Byrsomima crispis A. Juss., and when its leaf hairs are eventu-
ally deciduous instead of persistent (e.g., Cudronia 2150 [MICH, MO, VEN] and 2156 [MICH, MO, US, VEN]) the distinction be-
comes difficult. Nevertheless, B. aurora is a useful taxon and I am not yet ready to aban-
don it, especially because the two species sel-
dom if ever occur together.


Shrub or small tree 1–4 m tall; vegetative inter-nodes sparingly seriously to glabrate; stipules 1–2 mm long, distinct; petals 6–13 mm long; blade of larger leaves 5.5–9 × 1.5–3 (–4) cm, narrowly elliptic, rounded or ob-
tuse at apex, sparsely sericeous to glabrate, axially often persistently glabrous, the lateral veins numerous and fine; bracts and bracteoles persistent in fruit, pedicel de-
curved or twisted in fruit; sepal revolute in anthesis, petals white turning pink; anthers glabrous, the locules 1–1.3 mm long, dor-
vately flattened and narrowly winged, the connate exceeding locules by 0.5–0.8 mm, globose, ovary and fruit glabrous; fruits red or purplish, 5.5–7.5 mm diameter (dried). Along rivers, 50–200 m; Amazonas (basins of upper Rio Orinoco and upper Rio Negro). Co-
lobahia (Guiana), Brazil (Amazonas: upper Rio Negro and Rio Uacapui). Fig. 92.


Shrub or tree (1.5–)2–12 m tall; stipules (2–)3–5.5 mm long, 2/3 to almost completely conuate; petals 7–18–22 mm long; blade of larger leaves 5.2–15.5 × 3.7–10 cm, abaxially sericeous, sometimes eventu-
lally glabrescent, with hairs not dense enough to completely conceal epidermis; inflorescence 5–15 cm long; bracts and bracteoles deciduous be-
fore or during anthesis, 3.7–7 mm long or bracteoles shorter; petals nearly or quite straight in fruit; petals pink or pink in center and otherwise white; anthers glabrous, cylindrical, the connate exceeding

-Manteo.

Shrub or small tree 2–6 m tall; stipules 2–3 mm long, completely and smoothy conate; petals 5–8 mm long; blade of larger leaves 7–17 x 4–7 x 9 cm; s persistently subsericeous or appressed-tomentose abaxially, the hairs distinctly stalked, with slightly twisted, nonparallel crosspieces > 0.5 mm long, with 8–12 pairs of principal lateral veins strongly raised abaxially; bracts and bracteoles mostly deciduous before maturity of fruit; pedicels mostly decurved or twisted in fruit; sepals usually shorter; vegetative internodes glabrous except in axil of stipules; stipules 1.5–2.5 x 0.5–1 mm long, distinctly toothed; pedicels 7–17 mm long; blade of larger leaves 4.5–6.5 x (1.5)–2–5 x 0.5–1.5 mm long, distic; pedicels 1.5–2 x 0.5–1 mm diameter, scale-like in fruit; bracts and bracteoles persistent in fruit, 1–2.5-mm long, usually spreading and often revolute; pedicels cinnate in bud; 5–11 mm long in flower, straight or curved upward in fruit, becoming 7–12 mm long, 0.7–1.5 x 0.2 x 0.5 mm diameter; seeds flattened, reticulate in apex in anthesis, reflexed and revolute in fruit; petals pink? or white turning pink; other characteristics glabrous, somewhat flattened and bearing narrow membranous longitudinal wings, the connective exuding locules or exceeding them by up to 0.3 mm; ovary and fruit glabrous, fruits 4–8 mm diameter (dried), ± pubescent, brown or black; pedicels 0.5–1 mm diameter (dried).


—Chaparro, Manteo.


Shrub or small tree 1–5 m tall; stipules 1–2 mm long, conate; petals 0.5–2 mm long; blade of larger leaves 6–15.5 x 4–10 cm, usually glabrous or somewhat pubescent, showy and rather glabrous, yellowish orange or orange, 15–30 mm diameter (dried), with very soon quite glabrate, bracts and bracteoles mostly deciduous in fruit or rarely more or less persistent, 1.5–3.5 x 0.5 mm long or bracteoles smaller; pedicels decurred or twisted in fruit; sepals lanceolate-acuminate and membranous in fruit, petals white and/or pink; other characteristics glabrous, the connective exuding locules by 0.3–1.5 mm; ovary and fruit glabrous; fruits yellow (at maturity?), 8–9 mm diameter (dried). Sassandra, 50–900 m; Delta Amazoni (Los Colorado), common in middle and northern Bolivar, Anzoategui, Aragua, Barinas, Caro-

Byronia coccolobifolia, commonly known as the "Byronia" or "Byron's Plant," is a species of flowering plants in the family Malpighiaceae. It is native to South America, particularly to the Andean region. The plant is often used for medicinal purposes and as a source of food. Its leaves are used in traditional medicine for various ailments, and its flowers are used in ornamental gardens. The plant is also known for its attractive appearance, with large, showy flowers and glossy, dark green leaves. It is a popular choice for landscaping in tropical and subtropical regions. However, its natural distribution and specific habitats need further study to better understand its ecological requirements. The plant is threatened by habitat loss and fragmentation, and conservation efforts are needed to protect its natural populations.
As I noted in my 1981 paper, plants from near the Rio Atalaia sometimes have stipically small stature and leaves, which causes them to resemble their eastern relative *Byrsonima eigenfeldii* Swinthof. That species grows in sandy savannas of Guyana, Suriname, French Guiana and adjacent Amazonas, Brazil, including the tepui called Serra Araci, but seems not to reach Venezuela.


Tree 2–4/15 m tall; stipules 4–7.5 mm long, 1/5–1/4 connate, acute; pedicels 11–21 (15–25) mm long, blade of larger leaves 10–15 × 7–13 cm, sparsely sericeous to subsericeous glabrate, entire; fruits 15–25 mm diameter, green and sparsely to densely tomentose-sericeous; fruits yellow, 6–10 mm diameter (dried), glabrous or sparsely tomentose to glabrate. B. cowanii is known from savannas across northern Venezuela; Mexico, Central America, West Indies, Colombia, Guyana, Suriname, French Guiana, Brazil, Bolivia, Paraguay.

**Byrsonima crassifolia** is exceedingly variable throughout its range and may eventually yield defensible segregates, but within our area it is reasonably homogeneous. In my paper (1981) I recognized *B. laurifolia*, but subsequent study of the type has suggested that it is simply atypical material of this species. See discussion of probable hybrids under *B. verbascifolia*.


Tree 5–15 m tall; stipules 3–4.5 mm long, completely connate; pedicels 2.5–4.5 mm long, blade of larger leaves 6–9 × 3–4 cm, obtuse to nearly elliptic, obtuse to rounded and spicate at axils, spikes densely tomentose-sericeous, the lateral veins and reticulum obscure; bracts and bracteoles persistent in fruit, 1–1.5 mm long; pedicels decurved and/or twisted in fruit; petals probably pink or white; anther lobes appressed-hirsute, with anther lobes adhering at apices; the connective extending fertile part of locules by 0.1–1 mm; ovary glabrous; fruit unknown. Thorns in dry areas, 1400–1500 mm; Bolivar (northwest of Cerro El Sol). Guajara (upper Pataro River).

**Byrsonima dacus** is known from only two collections and, although these lack petals, it is keyed with some confidence as having pink or white petals because it is apparently related to *B. gymnocarpa* A. Juss., of Guyana, and *B. isaeuri* (Poir.) in Lamarck, D.C., a tepui subgenus, extending locally from 0.9–1.7 mm; ovary densely sericeous on distal half; styles 4.5–6.5 mm long; fruits 10–15–16 mm (dried), sericeous at apex. Local to lowland montane forests, 100–800 m; Amazonas (Cerro Hauchatire, 291 m), Rio Cacao, southern Brazil (Anapá, Bahia, Maranhão, and Piauí). *Byrsonima duidia* W.R. Anderson, Contr. U. Mich. Herb. 19: 361. 1981.


Shrub or tree (2–3–8–10) m tall; vegetative internodes velutinous; stipules 5–8 mm long, distinct, acuminate; pedicels 8–20 mm long, blade of larger leaves 8–16 × 4–8 cm, abaxially persistently velutinous; bracts and bracteoles persistent in fruit, 1.5–2.5–3.5 mm long; pedicels bracteoles smaller; pedicels de- or twisted in fruit; petals white turning pink or red in age; anther locules glabrous, linear, the connective extending locules by 0.5–0.9 mm; ovary and fruit glabrous; fruit red, 3.5–4.5 cm (dried). Riparian forests, 100–200 m; Amazonas (Rio Atalaia, Rio Macau, Rio Cupari, Rio Cacao, Rio Negro, Rio Orinoco, Rio Paraguaná, Rio Sapé, Rio Vénidero, Rio Yatana). Brazil (Amazonas: upper reaches; 50–2300 m). See discussion under *Byrsonima punctulata*.


Shrub or small tree 3–4 m tall; stipules 3–3.5 mm long, 1/2–3/4 connate, the apical lobes obtuse to rounded; petals 15–18 mm long; blade of larger leaves 5–8 × 3–4 cm, obtuse to nearly elliptic, obtuse to rounded and spicate at axils, spikes densely tomentose-sericeous, the lateral veins and reticulum obscure; bracts and bracteoles persistent in fruit, 1–1.5 mm long; pedicels decurved and/or twisted in fruit; petals probably pink or white; anther locules appressed-hirsute, with anther lobes adhering at apices; the connective extending fertile part of locules by 0.8–1 mm; ovary glabrous; fruit unknown. Thorns in dry areas, 1400–1500 mm; Bolivar (northwest of Cerro El Sol). Guajara (upper Pataro River).

**Byrsonima equisata** is known from only two collections, and although these lack petals, it is keyed with some confidence as having pink or white petals because it is apparently related to *B. gymnocarpa* A. Juss., of Guyana, and *B. isaeuri* (Poir.) in Lamarck, D.C., a tepui subgenus, extending locally from 0.9–1.7 mm; ovary densely sericeous on distal half; styles 4.5–6.5 mm long; fruits 10–15–16 mm (dried), sericeous at apex. Local to lowland montane forests, 100–800 m; Amazonas (Cerro Hauchatire, 291 m), Rio Cacao, southern Brazil (Anapá, Bahia, Maranhão, and Piauí).


Schrub or tree 3-4 m tall; vegetative internodes glabrous except in axil of stipules; stipules 1.5-3 mm long, distinct; petioles 110-120 mm long; blade of larger leaves 2.1-4.4 x 3.7-5.4 x 0.8-1.5 cm, glabrous on abaxial epidermis deeply pitted and t densely and persistently glabrous at maturity; bracts and bracteoles persistent in fruit, 0.5-1.5 mm long; pedicels ciliate in bud, decurved and eventually twisted in old flowers and fruit; petals pink or white and pink; anther locules glabrous, dorsiventrally flattened and longitudinally winged, the connective extending locules by 0.2-0.4 mm; ovary and fruit glabrous; fruits red at maturity, 4.5-5.5 mm diameter (dried). Riverbanks and lowland-white-sand savannas, 200-200 m; Amazónas (Brasileiro Casiquiare, Caño Saguá, Cerro Yanacu, Rio Emerealdia, Rio Aïscina, Rio Manaquiri, Rio Venutuari). Brazil (northwest Amazonas).


Tree 14-20 m tall; stipules 4.5-9 mm long, ½-connate; petioles 20-29 mm long; blade of larger leaves 11-15 x 5.5-9 cm, abaxially very densely and persistently setose; inflorescence 18-20 cm long; bracts and bracteoles deciduous before or during anthesis, 2.5-4.8 mm long or bracteoles smaller; pedicels nearly or quite straight in fruit; petals pink; anther locules glabrous, cylindrical, the connective extending locules by 0.8-1.3 mm; ovary densely setose; immature fruits 12-18 mm long; blade of larger leaves 8.5-14.5 x 4.8 cm, tomentose to glabrate at maturity except abaxial veins and midrib, the reticulum and areoles ±confluent; inflorescences 9-18 cm long; bracts and bracteoles persistent in fruit, 1.5-3 mm long or bracteoles smaller; pedicels usually decurved in fruit; petals white or pink, in age; anthers pink or white; anther locules glabrous, linear, the connective extending locules by 0.3-1.5 mm; ovary and fruit glabrous; fruits red to blue, 4-6 mm diameter (dried). On sandy soils in the Rio Negro and Solano, Santa Rosa de Manaquiri, Brazil (west Amazonas, Rondônia). Amazonian Peru (Loreto, Madre de Dios).


Small tree 2.5-4.9 m tall, rarely a shrub only 1-2 m; stipules 2-4 mm long, smoothly connate; petals 5.10 mm long, densely and persistently tomentose; blade of larger leaves 7.5-17 x 3.4-9 cm, elliptic to ovate, tomentose but soon ± glabrous; bracts and bracteoles deciduous in fruit, occasionally persistent; bracts (2-)3-6(9) mm long, narrowly lanceolate, bracteoles similar but shorter; pedicels straight or decurved in fruit; seeds lingulate-acuminate and membranous in fruit, petals pink or pink and white; anthers tomentose, the bulbous connective extending locules by 0.3-0.5 mm; ovary and fruit glabrous; yellow; fruits red to blue, 4-6 mm diameter (dried). On sandy soils in the Rio Negro, sometimes in seasonally flooded savannas, 100-200 m; Amazónas (Rio Atalaia, Rio Ixarapo). Amazonian Peru (Loreto, Madre de Dios).


Tree 6-26 m tall; stipules 4.8-8 mm long, completely connate, the pair rounded at apex; pedunculus (3-)5-13 (18) mm long; blade of larger leaves 10-19 x 24 x 4.5-10 x 14.5 cm; abaxially thinly to densely velutinous with erect, bifurcate hairs; bracts and bracteoles mostly deciduous before maturation of fruit; bracts 1.5-4 mm long; bracteoles 0.5-2.2 x 0.5-2.6 mm long; petals decurved or twisted in fruit; sepals glabrous on adaxial face; petals yellow; anthers loosely soriaceous, at least between locules, the connective equaling or slightly exceeding locules, ovary glabrous or sparsely sericeous distally; fruits yellow, 9-10 x 6 mm (dried), glabrous or with a few hairs at apex. Non flooded evergreen lowland forests, 100-200 m; Amazonas (Rio Casiquiare, between San Carlos de Rio Negro and Solano, Santa Rosa de Manaquiri), Brazil (western Amazonas, Rondônia), Amazonian Peru (Loreto, Madre de Dios).


Shrub 2-4 m or tree to 8-10 m tall; vegetative internodes glabrous except in axil of stipules; stipules 3-5 mm long, distinct, acute or obtuse at apex; petals 3.5-7 mm long; blade of larger leaves red to black, 3.5-8.3 cm, ovate, broadly oblong or rounded at apex, glabrous; bracts and bracteoles persistent in fruit, bracts 3.3-5 mm long, bracteoles slightly shorter; pedicels distally thickened, straight in bud and fruit; petals white to pink in age; anthers glabrous, the linear locules unwinged and the connective swollen but not or hardly extending locules; ovary and fruit glabrous; red to black, 3-4 mm diameter (dried). Low scrub, low forest (6-10 m), low Clusia-Magnoliand woodlands, 1400-1900 m; Bolivia (Boltepui). Guyana (upper Mazaruni River basin, Mount Ayanganna, Mount Wokomung).


Shrub 0.5-2 m tall; stipules 4.5-7 mm long, distinct or up to ½-connate, triangular; petioles 10-30 mm long; leaf blades 5.7-12 x 2.5-5 mm; fruit with dehiscent to oblanceolate to globose; bracts and bracteoles persistent in fruit; bracts 4.7-10 mm long; blade of larger leaves red to black, 7.4-8.3 cm diameter (dried). Green forest (10-13 m), low Clusia-Magnoliand woodlands, 400-900 m; Brazil (Amapá). Suriname (upper Mazaruni River basin, Mount Ayanganna, Mount Wokomung).


Tree 4-18 m tall, rarely a shrub only 1-2 m; stipules 2-4.5 mm long, smoothly connate; petals 5.10 mm long, densely and persistently tomentose; blade of larger leaves 7.5-17 x 3.4-9 cm, elliptic to ovate, tomentose but soon ± glabrous; bracts and bracteoles deciduous in fruit, occasionally persistent; bracts (2-)3-6(9) mm long, narrowly lanceolate, bracteoles similar but shorter; pedicels straight or decurved in fruit; seeds lingulate-acuminate and membranous in fruit, petals pink or pink and white; anthers tomentose, the bulbous connective extending locules by 0.3-0.5 mm; ovary and fruit glabrous; yellow; fruits red to blue, 4-6 mm diameter (dried). On sandy soils in the Rio Negro, sometimes in seasonally flooded savannas, 100-200 m; Amazónas (Rio Atalaia, Rio Ixarapo). Amazonian Peru (Loreto, Madre de Dios).
Tree 3–3.5 m tall; stipules 1–3 mm long, completely and smoothly connate; petioles 5–15–20 mm long; blade of larger leaves 6.5–10–16 cm × 1.7–3.5–6 cm, tightly sericeous abaxially to usually eventually glabrate, the hairs sparse or subsessile with short, strongly excurrent crosiers up to 3 cm long, with 15–20 or more pairs of fine lateral veins, none very prominent; bracts and bracteoles deciduous in fruit; pedicels mostly deciduous or twisted in fruit; petals yellow, the posterior petal bearing 2 or more glands at apex of claw or on base of limb; anthers sericeous, at least between locules, the connective equaling or slightly exceeding locules; ovary sericeous; fruits yellow-orange, 10–12 mm diameter (dried), sericeous to glabrate. Dry scrubland to wet forest, near sea level to 1000–2000 m; Delta Amazónica (near village of Morichico), common in Bolver, Amazonas (Puerto Ayacucho to El Burro, Rio Marañon, Yaquíte), Amazóni, Arauca, Barinas, Falcón, Lara, Mérida, Miranda, Monagas, Sucre, Trujillo, Yaracuy, Zulia; Panama, West Indies, Colombia, Guyana, Suriname, French Guiana, Peru, Brazil, Bolivia.

The small genus Nyctanthes is usually glabrescent at maturity. When the hairs persist (e.g., *Dendro- Miller 27179, MICH, MO, VEN, Ilbert et al. 11539, MICH, VEN, Steyermark et al. 115966, MICH, VEN), the leaves have a different aspect, but I believe this to be suggesting that these plants deserve taxonomic recognition. In my 1961 (p. 96) I stated that *B. propinqua is a name for such plants, but that incorrect; the holotype of *B. propinqua (K) has rather large leaves for the species, but they are glabrescent.

**Byronia**

Tree 3–5 m tall; vegetative intermodo glands glabrous except in axil of stipules; stipules 2–3.5 mm long, distich, petioles 18–23–33 mm; blade of larger leaves 11–32.5–17.5 × 5–6.5–8.5 cm, glabrous; bracts and bracteoles persistent, in leaf axils 5–8 mm; pedicels ascending and becoming sigmoid in fruit, 8–12 mm long; 0.8–1 mm diameter; petals almost palescent in color, scattered to 5–7 mm in fruit, the sepalae are often closely investing the enclosing fruit; petals and stamens unknown; fruits 6–8 mm diameter (dried), glabrous. Along black-water rivers, 100–200 m; Amazonas (Casa Cañar, Rio Angaleo, Rio Autana, Rio Cuchanéo in Rio Abasol drainage). Otherwise known from one collection in Caquetá, Colombia.

I plan to describe this species in the near future, giving it the epithet "ruminata" in reference to the pedicel, which is particularly sigmoid–ascending in fruit. The species resemblance *Byronia* ruminata W. R. Anderson, a plant from the vicinity of Rio Negro that differs in its longer stipules, glabrous sepals that are soon reflexed or reflexed in the enclosing fruit, fruiting pedicels that are thicker and curved upward but not sigmoid, and larger fruits. The petioles of the new species can be expected to be white turning red, as in *B. ruminata*, and for the same reason its anthers should have a large, glandular connective that extends well beyond flattened locules.


Woody vines or shrubs; stems tetrate, with many tiny punctiform lenticels. Leaves decussate; stipules none (? or minute (ca. 0.3 mm long), triangular, borne on stem at base of petiole. Inflorescence a pseudocarneae, simple or compound to form a panicule, terminal or lateral. Calyx bearing 8-10 glands; petals pink and/or white, abaxially winged. Stamens 10, globose; filaments basally to half-conulate, straight or the posterior 3 especially the 1 opposite posterior petal) sigmoid. Ovary of 3 carpels, connate at base, distinct distally; styles 3, stout, strongly unequal, the anterior thinner and usually shorter than the other 2, bent toward posterior petal, the 2 posterior styles turned toward anterior sepal; stigma large, internal, the styles dorsally truncate to prominently hooded at apex. Fruit a schizocarp comprising 3 (or fewer by abortion) dry indehiscent mericarps separating from a short pyramidal torus; mericarp with the wings reduced to winglets or rounded outgrowths.

Amazonian Colombia, southern Venezuela, Brazil, Bolivia; 3 species, 1 in Venezuela.


Trees, shrubs, or subshrubs, with mostly basified or sub-basified hairs. Leaves ovoidal, often glossy, especially abaxially, proximal portions of stipules and petiolo fused to form an interpetiolar sheath; distal portions of stipules (the
part extending beyond petiole) distinct or connate. Inflorescence a simple or compound thyrse (i.e., a raceme or panicle of cincinnus) or a pseudocoma (i.e., a raceme of 1-flowered cincinnus); bracts and bracteoles glabrous, caducous or eventually deciduous. Sepals all bidentate, accrescent in fruit; petals yellow, often with red claws. Stamens 6–10; anthers with each half bearing at apex and angled forward 1 or occasionally 2 stout, basifixed, awn-like hairs. Ovary composed of 3 completely connate carpels, but only 2 locular; the anterior carpel reduced to a ridge of tissue; styles 3, slender and subulate with minute slightly introrse stigmas. Fruit a spheroidal or ovoidal, dry, indesiccated, nut-like capsule ca. 2.5 mm high and wide, with a thin exocarp and a bony, smooth or rugose endocarp and containing 2 seeds (or 1 due to abortion), subtended and enclosed by accrescent (in most species red, membraneous, veiny, wing-like) sepals.

Endemic to the Guayana Shield in Colombia, southwestern Venezuela, and Brazil, 11 species, 10 in Venezuela, all in the flora area. "Dicidia arcuata" was described from the Serra Aracá in Brazil, but may eventually be found in Venezuela. It is similar to D. ferruginea, but differs in having 8 fertile stamens, the anther connectives hardly enlarged, the sepals glabrous on the margin, and the leaves seen glabrescent adaxially.

Key to the Species of Dicidia

1. Stamens 10; sepals only slightly accrescent in fruit, up to 3.5 x 2.5 mm; interpetiolar stipular sheath 2–3 x 0.6 mm long, oblong, lacking median seama; 500–400 m .................................................. D. galpiniioides

2. Stamens 6–9; sepals greatly accrescent in fruit, forming membranous wings 7–13 x (2.5–14 12 mm; interpetiolar stipular sheath 4–26 x 0.6 mm long, marked by median seama; 300–2000 m ............................................. D. kundhardtii

3. Stipules lobes beyond petiole completely connate to form a single interpetiolar structure .................................................. 3

4. Stipules lobes beyond petiole nearly or quite distinct .......................... 6

5. Stipules 7–11 mm long beyond petiole, acute or obtuse at apex .................................................. D. pulcherrimus

6. Stipules 28–90 mm long beyond petiole, broad obovate or rounded at apex .................................................. 4

7. Inflorescence a simple pseudocoma, glabrous or very soon glabrate; bracts and bracteoles, and sepals glabrous; shrubs 0.5–3 m tall .................................................. D. stipularis

8. Inflorescence compound, with a terminal axis and few to many lateral axes, and with the cincinnus several-flowered; infrutescence, bracts, bracteoles, and sepals densely and persistently hairy; shrubs or trees (1–12 m tall) .................................................. 4

9. Leaves glabrate abaxially or hairy only on veins; 600–1600 m .................................................. D. glaucescens

10. Leaves densely and persistently rufous-sericeous abaxially over the whole surface; 1500–1900 m .................................................. D. rufa

11. Inflorescence a simple thyrsus with several-flowered cincinnus, glabrous; leaves glabrous or loosely sericeous to glabrate abaxially .................................. D. cordata

12. Inflorescence a pseudocoma, hairy; leaves hairy abaxially ........................................... 7

7(6). Vegetative internodes glabrous .................................................. D. hypoleuca

8(7). Leaf blades glabrous or soon glabrescent adaxially except for venous stipples 1–3 mm long beyond petiole .................................................. D. ferruginea

9. Leaf blades densely and persistently hairy adaxially; stipules 5–15 mm long beyond petiole .................................................. D. severinii

9(8). Leaf blades abaxially, the hairs much twisted and intertwined .................................................. D. vestita


Shrub or small tree 0.5–2(–4) m tall; vegetative internodes sericeous; stipules 2–5 (7) mm long beyond petiole, completely connate and rounded at apex; petals 4–5 mm long including petiole-stipule sheath, blade of larger leaves 2–4(–6) x 0.7–1.2–2.7 (–5) cm, loosely sericeous to subpubescent on both sides, occasionally glabrescent in age; inflorescence a simple thyrsus with cincinni (15–101–101)–flowered, glabrous or princi-

Partially sparingly sericeous; stamens 10; sepals in fruit up to 3.5 x 2.5 mm. On or among granu-

lar outliers, 50–400 m; Brotor (Rio Cauri south to Pedro de Cérea). Adjacent Colombia and Brazil.

In my 1981 paper I recognized Dicidia parviflora as distinct from D. glaucescens. However, the accumulation of intermediate forms has convinced me that it is simply a small-leaved form that may not have the same genetic basis, reflecting nothing more than the extremely harsh conditions sometimes found on the granitic outcrops where it grows. Most of the characters I used in my earlier key overlap too much to be diagnostic, and the Venezuelan plants with the small-leaved D. parviflora (Berry et al. 5114 [MICH], Morillo & Lachm. 5340 [MICH, VEN, YUC], Murillo 6851 [MICH, YUC]) have the larger bracteoles of D. galpiniioides.


Shrub or small tree (1–2–15 m tall; vegetative internodes glabrous; stipules 70–90 mm long beyond petiole, completely connate and rounded at apex; petals 34–63 mm long including petiole-stipule sheath; blade of
larger leaves 16-27 x 11-18 cm, glabrous adaxially, sericeous on midrib and veins to soon glabrate abaxially, inflorescence a compound thyrsus, the cincinni mostly 4-10-flowered, laxly rufous-sericeous; stamens (8):0; sepal in fruit up to 9 x 4 mm. Topui slope forests, 630-1600 m; Amazonas (Cerro Aracuani, Sierra de la Neblina). Brazil (Amazonas: Sierra Pirapora).


Shrub or tree 3-10 m tall; vegetative internodes glabrous; stipules beyond petiole 10-18 mm long, conic for up to 3 mm and distally distinct, acute or acuminate at apex; petals 16-23 mm long including petiole-stipule sheath; blade of larger leaves 5.5-10.5 x 3-6 cm, adaxially glabrous, abaxially densely and persistently white or yellowish-sericeous; inflorescence a pseudoraceme, loosely sericeous; stamens 8; sepal in fruit up to 3 x 8 mm. Upper tepal slips, 500-1200 m; Amazonas (Cerro Yapacana). Endemic.


Shrub or small tree to 4-8 m tall; vegetative internodes glabrous; stipules 7-11 mm long beyond petiole, completely conic, acute or obtuse at apex; petals 17-26 mm long including petiole-stipule sheath; blade of larger leaves 4-7 x 2.3-5 cm, adaxially sparsely sericeous to glabrate, abaxially spreading-sericeous on midrib and lateral veins; inflorescence a pseudoraceme (the cincinni rarely 2-flowered), villous; fertile stamens 8; sepal in fruit up to 3 x 4 mm. Topui meadows and low woodlands on sandy soil, 1400-1600 m; Amazonas (Cerro-Sigapoa massif). Endemic. *Fig. 87.


Shrub or tree 2-12 m tall; vegetative internodes glabrous; stipules 40-80 mm long beyond petiole, completely conic and rounded at apex; petals 20-40-50 mm long including petiole-stipule sheath; blade of larger leaves 8.5-17 x 5.8-14 cm, glabrous adaxially or sericeous on midrib, laxly and persistently rufous-sericeous all over abaxial surface; inflorescence a compound thyrsus, the cincinni mostly 2-4-flowered, densely rufous-sericeous; stamens (8):0; sepal in fruit up to 9 x 4 mm. Low tepui forests and bromeliad-scrub zone on escarpment slopes and ridges, 1500-1900 m; Amazonas (Sierra de la Neblina). Brazil (Amazonas: Sierra Pirapora).


Shrub or tree (1-)3-8 m tall; vegetative internodes loosely sericeous to villous; stipules 9-15 mm long beyond petiole, distinet, acuminate at apex; petals 23-30 mm long including petiole-stipule sheath; blade of larger leaves 6-10 x 3-4.5 cm, adaxially villous, abaxially densely sericeous; inflorescence a pseudoraceme, villous; stamens 8; sepal in fruit up to 9 x 4 mm. Topui slope and summit vegetation, 1300-2300 m; Bauru (São-Paulo). *Fig. 88.


Shrub 0.5-3 m tall; vegetative internodes glabrous; stipules 20-62 mm long beyond petiole, completely conic, broadly obtuse or rounded at apex; petals 15-24 mm long including petiole-stipule sheath; blade of larger leaves 4.0-13.5 x 2.3-9.5 cm, adaxially glabrous, abaxially densely and persistently white- or yellowish-sericeous; inflorescence a pseudoraceme, glabrous or very soon glabrate; stamens 8(7); sepal in fruit up to 12 x 5 mm. Topui scrub, 1600-2000 m; Amazonas (Cerro Parak). Endemic.

**Diacidia vestita** (Becht.) B.D. Jack, Index Kew. 1: 741. 1895. —Colostychys

Woody vines. Stipules small, interpetiolar. Inflorcessence a decompound panicle, the flowers borne ultimately in short pseudoracemes with decussate bracts, each bract subtending a 1-flowered peduncle with apical bracteoles. Sepals imbricate in anthesis, the anterior eglantular, the lateral 4 biglandular, all accrescent in fruit; petals yellow, abaxially densely sericeous, adaxially glabrous or tormentose. Stamens 10; filaments and (in our species) the locules hairy. Ovary formed from 3 completely connate carpels, the 2 posterior locules full-sized and fertile, the anterior locule smaller and empty; styles distinct and straight, the posterior 2 stout, obliquely truncate or short-hooked at apex and with large internal stigmas, the anterior style absent or short, slender, rudimentary. Fruit composed of a dry, hard, indehiscent, nut-like structure with a thick, fibrous wall, containing 1 or 2 seeds, most often 1 seed, subtended by 5 dry wings formed by enlargement of the sepal.

Costa Rica, Colombia, Ecuador, Peru, Brazil, Bolivia, Paraguay, Argentina; 7 species, not yet known from Venezuela but 1 likely to occur there in the Sierra Nevada. See Mark W. Chase, 1981 [A revision of Dicella (Malpighiaceae), Syst. Bot. 6: 159-171].


Woody vine climbing to 30 m; petioles 13-24 mm long; blade of larger leaves 16-19-22 x 6-11 cm, elliptic, acuminate at apex, abaxially persistently sericeous; bracts (1)-3-7 x 2-5 mm, bracteoles similar but smaller; fruit spherical, 13-18 mm diameter, wings (enlarged sepals) subtending fruit 20-55 x 7-20 mm, unequal, the anterior eglantular one shortest, the posterior-lateral pair intermediate, the posterior-lateral pair longest. In forests near rivers, 200-400 m. Western Amazonia (Colombia, Ecuador, Peru, Brazil; known from Rio Matuara, Rio Casanare, on the lower slopes of the Brazilian side of the Sierra de la Neblina, and therefore to be expected on the Venezuelan side. Fig. 91.

Woody vines. Stipules small, distinct, interpetiolar. Inflorescence axillary, shorter than the subtending leaves, of 1–several simple 4-flowered umbels or 1–several racones of up to 7 4-flowered umbels; pedicels sessile; bracts and bracteoles similar; ligulate, glandular, spreading, persistent, borne in a cluster of 12 at base of umbel. Anterior sepal usually glandular, rarely bearing 1 abaxial gland; 4 lateral sepals biglandular; petals yellow, long-fimbriate, abaxially sparsely sericeous. Stamens 10, all fertile; anthers unequal. Gynoeceum of 3 free carpels adnate to a common torus; styles 5, distinct, with capitate terminal stigmas. Fruit dry, breaking apart into 3 mericarps; nut of mericarp with a hard woody pericarp, bearing a dorsal crest and 2–several lateral winglets or crests parallel to areoles and interconnected by ridges.

Mexico, Colombia, Venezuela, Guyana, French Guiana, Ecuador, Peru, Brazil, Bolivia; 4 species, 1 in Venezuela.

See Brunvon Gates, 1982 [Banisteriopsis, Diplopterys (Malpighiaceae), Pl. Nostrop. Monogr. No. 30].


Woody vine; pedicels (4–9–15–22) mm long, bearing 2 large convex glands on margin at apex; blade of larger leaves (8–10–22–26) × (3–4)–5–9 cm, elliptic, long-acuminate at apex, abaxially sparsely sericeous; mericarp with nut up to 15 mm diameter, bearing a dorsal crest or winglets 1–5 cm wide and essentially 4 roughly parallel ridges or winglets on each side 0.5–10 mm wide, these irregular, dissected, and interconnected with transverse ridges. Riparian forests, 100–200 m; Amazonas (Rio Madeirinuma, Rio Orinoco above San Fernando de Atalaia). Amazonian Colombia, Ecuador, Peru, Brazil. [Fig. 99].

*Diplopterys cabrerana* is widely used by indigenous peoples in western Amazonia as an admixture to *Banisteriopsis caapi* in the preparation of hallucinogenic concoctions.


Woody vines. Leaves with petiole biglandular; stipules small, triangular, borne on very base of petiole or on adjacent stem, or absent; blade eglandular or bearing small glands on margin, the tertiary veins strongly parallel (scalariform). Inflorescence a simple axillary raceme of 5–7–9 4-flowered umbels, with 1 umbel terminal and the other 1–4 pairs axillary to bracts bearing stipules and often petiole glands; floral bracteoles small, persistent, eglandular; floral bracteoles small, persistent, each one of each pair bearing 1 bulging eccentric abaxial gland toward center of umbel; pedicels incurved in bud as far as known. Sepals all eglandular or the lateral 4 biglandular, rotate in anthesis; petals yellow, glabrous. Stamens 10, all fertile; anthers ± siliate. Ovary with the 3 carpels nearly distinct, all fertile; styles 3, inserted low on ventral face of carpels, the apex with a large internal stigma and dorsally truncate, apiculate, or bearing a hook up to 0.3 mm long. Fruits breaking apart into 3 samaras, each with a large, membranous, subicular lateral wing borne on upper edge of nut, incised to nut apex, usually continuous at base; dorsal wing small; intermediate winglets absent.

Venezuela, Guyana, Suriname, French Guiana, Brazil, Bolivia; 4 species, 1 in Venezuela.

Three of the species of *Excentradenia* are from north of the Amazon and the other is from Bolivia. It is close to *Hieron* but differs in the small basal stipules, racemose branching of the inflorescence, eccentric bracteole glands, and samara wing.

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Fig. 99. *Diplopterys cabrerana*. —A. Flowering branch, x0.5. —B. Leaf base with glands, x1.6. —C. Umbel of 5 buds, x3.1. —D. Abaxial view of posterior-lateral petal (above) and posterior petal (below), x4.1. —E. Abaxial view of petal (left), x10.7. —F. Gynoeceum, anterior style in center, x10.7. —G. Mericarp with short wings, abaxial view (left), adaxial view (middle), cross section (right), x1.1. —H. Mericarp with long wings, abaxial view (left), adaxial view (right), cross section (below), x1.3. (New York Botanical Garden 1981.)
usually continuous at the base. Only the type species occurs in Venezuela and the
flora area.

Excentradenia adenophora (Sandwith) W.L. Anderson, Contr. Univ. Michigan
Herb. 21, 31, 1997. -Hirtrea adenophora
Woody vine, leaves opposite, subopposite, or alternate, stipules 0.4–0.8 mm long, borne
on pedicel at very base; pedicels 10–29 mm long; blade of larger leaves 8–15.5 × 4.5–10.3
cm, ovate or elliptic to orbicular, obtuse or rounded and abruptly short-acuminate at
 apex; floriferous peduncles 1–2.5 mm long; pedicels 7–10 mm long; anterior sepal eglan-
dular, the lateral 4 biglandular; styles bowed outward, dorsally apiculate at apex; samaras
depressed-circular with the not positioned below the center, 57–66 mm wide, ca. 50 mm
high. Near streams, 100–200 m; Delta ama-
curu (east side of Rio Guayab), Bolivar
(southwest of El Manteo on road to San
Pedro de las Dos Bocas). Guyana. *Fig. 39.

Fig. 82. Excentradenia adenophora A–G. —A. Large bud, adaxial view, x0.54, and base of pedicel with stipule, x2.7.—B. Flower, x0.54. —C. Umbel of 4 distichous buds, x2.7.—D. Base of umbel
colored to show ecoric glands on 4 bracteoles, x0.6.—E. Flower with posterior petal uppermost,
x2.7.—F. Anthere, adaxial view (left), side view (right), x16.8.—G. Distal portion of style, side view,
x16.8.—H. Abaxial view of samaras of E. propinqua (similar to that of E. adenophora), x0.54.
©University of Michigan Herbarium 1997.

Shrubs or trees. Leaves bearing abaxial glands; stipules interpetiolar, linear, 9–24 mm long, the adjacent stipules from opposite leaves connate in pairs, the 2
pairs at each node conduplicate and equitant over the apical bud, caducous, the
members of a pair often splitting apart before falling off. Inflorescence terminal,
usually unbranched, a raceme of short cincinni, the bracts and bracteoles persistent,
the lowest bracteole and alternate subsequent bracteoles bearing 1 large ecoric
abaxial gland. Flower buds pyramidal, with the conical-galeiform outermost petal
completely covering the others. Sepals all biglandular; petals usually described as
white, occasionally "yellow." Stamen 10; filaments densely hirsute; anthers
unginged, tapering distally into 2 sterileawn-like extensions exceeding the slender
connective. Ovary of 3 completely connate carpels, with all 3 locules fertile; styles 3,
subulate; stigma minute and terminal. Fruit an indeliscent fibrous nut, cylindrical
or truncate-conoid, dry at maturity and without a stony endocarp, containing only
1 locule completely filled by 1 large seed.

Amazonian Colombia, Venezuela, and Brazil; 3 species, 1 in Venezuela.

Fig. 84. Glandonia williamsii

Woody vines, shrubs, or small trees. Leaves usually bearing glands; stipules very small, distinct, triangular, borne on or beside base of petiole, or absent. Flowers borne in umbels, corymbbs, or pseudoracemes, these single or groups in racemes or panicles; in axillary or terminal; petals mostly yellow or pink. Stamens 10; anthers ± alike, the connective not or hardly exceeding locules (fertile stamens apparently only 6 or 7 in H. maguirei). Ovary with the 3 carpels partially connate, all fertile; styles 3, the apex with a large, usually internal stigma and dorsally rounded, truncate, acute, or hooked, the stigma very rarely terminal. Fruits breaking apart into 3 samaras, each samara having its largest wing dorsal, thickened on the abaxial (lower) edge and (in most species) bent upward, the veins terminating in the thinner adaxial edge; much shorter winglets or crests present on sides of nut in some species; dorsal wing rudimentary in a few species.

Mexico, Central America, West Indies, South America (all countries except Chile), western Africa (1 species); at least 125 species, 26 known or expected in Venezuela, 20 of these in the flora area.

Key to the Species of Heteropterys

1. Petioles biglandular at base
   1. Petioles eglandular or bearing glands near or above middle
      2. Pedicels pendunculate
         2. Woody vine; petioles 14–20 mm long; blade of larger leaves 10–15 × 4–11 cm, toothed abaxially with the hairs clearly stalked; infructescence a raceme or panicle of umbels .................................................. H. nebifer

3. Shrub or slender tree 1–3 m tall; petals 5–10 mm long; blade of larger leaves 3–9 × 2–5 cm, sericeous or appressed-tomentose or almost glabrous abaxially with the hairs nearly or quite sericeous; infructescence a single umbel terminating a leafy shoot .................................. H. steyermarkii

4. Infructescence compound, paniculate, with the flowers borne ultimately in umbels or tight corymb of 4–10; bracteoles eglandular; petals pink or pink and white, with a prominent abaxial wing on the limb; sepals appressed ........................................................................... H. cristata

5. Infructescence simple, an elongated pseudoraceme of 20–60 flowers; 1 of each pair of bracteoles bearing 1 large eccentric abaxial gland; petals yellow, abaxially smooth; sepals revolute at apex ........................................... H. molesta

6. Sepals erect or appressed; petals exposed early and through enlargement of bud, yellow, bronze, brown-maroon, pink, or white ........................................................................... 6

7. Mature leaf blades glabrous or glabrately or only sparsely sericeous, the hairs not apparent without a lens ................................................................. 7

8. Mature leaf blades persistently and obviously sericeous or tomentose abaxially .................................................. H. diderosa

9. Petioles yellow, abaxially smooth or with the midvein prominent; anthers loosely sericeous; petals 12–22 mm long; blade of larger leaves 9–20 × 4.5–12 cm; samaras 60–80 mm long, the nut smooth or rugose and without lateral crests or bearing a small crest 1.5 mm wide on each side ................................................................. H. macrostachya

10. Leaf blades tightly and persistently sericeous abaxially; petals yellow, abaxially carinate; nut of samara with the sides quite smooth; blade of larger leaves 11–20 × 6–11 cm .............................................................................. H. cristata

11. Leaf blades eventually glabrate abaxially, soon glabrate and shining adaxially; petals 5–9 mm long; bracteoles appressed; stigma laterally compressed, higher than wide .......................................................................... H. cristata

12. Leaf blades persistently tomentose abaxially, x persistently tomentose and not shining; petals 2–3 mm long; bracteoles spreading; stigma laterally expanded, at least twice as wide as high ..................................... H. diderosa

13. Bract 4.5–8 mm long; bracteoles 3–5 mm long ........................................................................... 11

14. Bracts 0.5–1.5 cm long; bracteoles 0.5–2.5 cm long ........................................................................... 12

15. Blade of larger leaves 23–33 × 8–14 (–19) cm, abruptly acuminate at apex; pseudoracemes 6–20 cm long; bracts 3–6 mm wide; bracteoles 5–8 mm wide; fertile stamens 10; styles 3.8–4.5 mm long, with a well-developed dorsal hook 0.3–0.6 mm long at apex; samara wing 22–37 mm wide ........................................................................... H. leonis

16. Blade of larger leaves 8–10.5 × 4.7–6.7 cm, very broadly oblate or rounded and sometimes retuse and apiculate at apex; pseudoracemes 2–6 (–9) cm long; bracts 1.3–3 mm wide; bracteoles 1.2–2.5 mm wide; fertile stamens 8 or 7 (as far as known); styles ca. 2.3 mm long, dorsally truncate or rounded at apex; samara wing 11–13 mm wide ........................................................................... H. maguirei

17. Infructescence composed of umbels or corymbs of (3)4–6 (–8) flowers or of short crowded pseudoracemes with 1–3 pairs of flowers and then a terminal umbel, the axis (excluding the floriferous peduncles and pedicel(s) up to 1.5 cm long (sometimes to 2.5 cm in H. neocosa) ........................................... 13

18. Infructescence composed of elongated pseudoracemes not terminating in umbels, these mostly over 2.5 cm long, often much longer ........................................... 18

19. Leaf blades glabrous abaxially ................................................................. 14

20. Leaf blades sparsely to densely sericeous or tomentose-abaxially (older leaves sometimes eventually glabrescent) ........................................... 15

21. Branches of infructescence usually with 1–3 pairs of flowers below terminal umbel; samaras 19–40 mm long ........................................................................... H. diderosa

22. Branches of infructescence usually without flowers developed below terminal umbel; samaras 40–50 mm long ........................................................................... H. diderosa

23. Bracts (and often bracteoles) reflexed or revolute; leaf blades sparsely sericeous abaxially, the hairs visible only with a lens ........................................................................... H. diderosa
15. Bracteoles ascending, leaf blades moderately to densely sericeous or tomentose-sericeous abaxially, hairs visible without a lens

16(15). Sepals minutely ciliate, blade of larger leaves 2.5-4.5 cm wide

16. Woody vine; leaf blades acuminate at apex, the reticulum nearly or quite invisible axially; petiole of larger leaves 5-11 mm long; inflorescences short-stalked and crowded, mostly shorter than subtending leaves; anther connectives with a dark red spot just above insertion of filament, otherwise yellow

H. freycinetianus

17. Woody vine; leaf blades acuminate at apex, the reticulum nearly or quite invisible axially; petiole of larger leaves 5-11 mm long; inflorescences short-stalked and open, often longer than subtending leaves; anther connectives with a dark red spot just above insertion of filament, otherwise yellow

H. flavescens

18(12). Woody vines

19. Shrub; shrubs, or small trees

20. Beech-like (1 or both) usually bearing 1 or 3 prominent abaxial glands; petioles sometimes bearing 1 or 2 glands on distal half; samaras usually ca. 3 times as long as nut, the wing usually flabelliform, its abaxial edge often recurved

H. oreganensis

19. Beech-like 

20(18). Leaf blades densely and persistently tomentose to subsericeous abaxially, the hairs short-stalked, moderately sinuous to twisted, their crosspieces 0.5-1 mm long

H. quetopus

21(20). Leaves obtuse or rounded at apex, opposite, alternate, or whorled; arrangement often variable on the same stem, seldom strictly decussate; petioles 0.5-5 mm long, eglandular

H. oblongifolia

21. Leaves mostly narrowly acute or acuminate at apex, distinctly decussate (if somewhat obtuse at apex, the petioles mostly bearing 2 sunken glands near middle); petioles 4 mm long or longer, eglandular; bearing 1 or 2 pairs of glands between middle and apex

22(21). Leaf blades moderately to strongly revolute, with the fine reticulum much more prominent abaxially than axially; vegetative internodes nearly or quite glabrous; abaxial leaf epidermis papillate (due to protruding starch grains in guard cells), often glabrous

H. oblongifolia

22. Leaf blades nearly or quite flat, with the reticulum about as prominent abaxially as axially or more prominent abaxially; vegetative internodes minutely sericeous to glabrate; abaxial leaf epidermis smooth or obscurely papillate, not glabrous

H. atropurpurea

23(21). Leaf blades with the very fine reticulum equally visible on both sides in dried leaves, the finest subdivisions almost as prominent as the lateral veins; most petioles bearing 2 sunken glands near middle, and occasionally 2 more near apex; bracts (and at least some bracteoles) deciduous before maturation of fruits; samaras 17-20 × 6-8 mm

H. acaule

Heteropitys

23. Leaf blades less sericeous; blade of larger leaves 7.5-8 cm wide; samaras 3-4 orders of prominence from lateral veins to finest and substantially less prominent veinslets; petioles eglandular; bracts and bracteoles mostly persistent; samaras usually 25 × 10 mm or larger

H. macrodonta

For a discussion of the parallel variation found in this species and its morphological and geographical sister Heteropitys oblongi- folia, see p. 146 in the 1961 paper where it was described.

Heteropitys acaule (W.R. Anderson) W.R. Anderson, Cent. Univ. Michigan Herb. 16: 75. 1987. - Heteropitys brevifolia var. acaule W.R. Anderson, Mem. New York Bot. Gard. 52: 184. 1983. - Woody vine or shrub to 8 m tall; blade of larger leaves 4.5-7.5 × 3-5.2 cm, ovate, rounded or reniform and often mucronate at apex, densely and persistently tomentose on both sides, especially abaxially; flowers borne ultimately in umbels, corymbs, or short crowded pseudoracemes of 4-14; sepals erect or appressed in anthesis; petals pink or white, the lateral 4 axially winged, the posterior carinate or with a narrow wing; samaras 18-20 × 7-12 mm, ovate, bearing on both sides 1-2 serrate crests or winglets 0.5-2.2 mm wide. Open places in woods, especially in saussurias and on granitic outcrops, 100-300 m; Bolivia (Cerro San Borja along lower Rio Santaqu), Amazonas (Cerro Puri), vicinity of Puerto Amador, Colombia, Chairos, Miranda, Zulia, Colombo, east of the Andes, especially common in the Llanos Orientales.

Heteropitys acaule (W.R. Anderson) W.R. Anderson, Mem. New York Bot. Gard. 52: 184. 1983. - Woody vine; petioles (4-6-12-15) mm long, usually biglandular near base; blade of larger leaves 6-12.5 × 3.5-6.5 cm, ovate, acute or acuminate at apex, initially sericeous or tomentose, soon glabrate and shining adaxially; soon to eventually glabrate abaxially; inflorescence with the flowers borne ultimately in umbels or tight corymbs of 4-10; sepals erect or appressed in anthesis; petals pink or white, axially winged; samaras 28-39 × 15-15 mm, the nut bearing on both sides a crest or wing 1-3 mm wide, suberect or dissected into several winglets. Lowland to lower montane forests, often along rivers, 100-140 m; Bolivia (southwest of Roraima-tepu), Amazonas (Ituk Raton, Puerto Ayacucho, Rio Ventuari),


Shrub 4 m tall; petals 1.4–1.8 mm long

200–900 m; Amazons (Cerro Araucanias). Endemic.


Usually a woody vine, occasionally a shrub; blade of leaves 9–16.5 × 4.7–4.7 cm, elliptic, margin or scabrous. Hairs dense and often pubescent, shiny blackish, densely and sometimes branched; pubescence covering the leaf blade densely and almost unnoticeable. Leaves alternate, usually simple, rarely compound, occasionally with a midrib. Flowers small, yellow; petals broad, ovate, usually pubescent, and often hairy. Inflorescence small, usually with 3–6 flowers. Fruits small, black, drupes, or berries. Seeds small, black, shiny, with a raphe. Heteropyxis macrodendron is a common species in the Amazon region, and it is often used in traditional medicine. It is also known for its ornamental value and is sometimes cultivated in gardens.
Woody vine; petioles 14–20 mm long, biglandular at base; blade of larger leaves 15–15 × 6–11 cm, suborbicular or broadly ovate or elliptic, rounded and spinulate at apex or abruptly short-acuminate, abaxially densely and persistently sulfur-tomentose; flowers borne in umbels of 5–15 (~20?) pedicels sessile; sepals appressed in azellia; petals "bronze" or "pale yellow tinged with brown";amaranth 25–35 × 11–13 mm. Amazonas (known only from escarpment overlooking Catón Grande, Sierra de la Neblina, 1700–2000 m). Endemic.


Woody vine; blade of larger leaves 7–13 (~17) × (2–3)–6.5–8) cm, elliptic or ovate or somewhat obovate, acuminate at apex, glabrous; ultimate branches of infructescence up to 1.5–2.5 cm long, terminating in umbels of 4–6 flowers usually subtended by 1–3 proximal pairs of flowers; sepals revolute at apex; petals yellow; samaras 19–40 × 8–13 (~16) mm. In lowlands, along rivers and in ± open savannas, often on white sand, 50–200 m; southern Amazonas (Cacho Canamé, La Esmeralda south to Rio Negro and Rio Baria, San Antonio). Eastern Colombia; Guyana, Suriname, French Guiana, Peru, Amazonas and central Brazil, Bolivia, Paraguay.

The plants to which I have applied this name are rather diverse through their range, and may represent more than one species.


Shrublet, shrub, or small tree 20 cm to 4 m tall; leaves alternate, opposite, or whorled, the arrangement often variable on the same stem; petals 6–5 mm long, aglandular; blade of larger leaves 6–12–13.6 (1–14) cm, narrowly to broadly elliptic or somewhat ovate or oblongate, obtuse or rounded at apex, sparsely serrate to spinulose; flowers borne in pseudoracemes; sepals revolute at apex; petals yellow; samaras 19–30 × 8–11 mm. Dry rocky places with shrubby vegetation, near sea level to 200 m; Bolivar (between Cumaru and Los Pilgueros), Amazonas (northeast of Puerto Ayacucho). Anzuategui, Apure, Cojedes, Guárico, Sucre.

**Heteropterys siderossa** Cuatrec., Webbia 13: 476. 1958.

Woody vine; blade of larger leaves 10–22 × 4–6 cm, elliptic or oblongate, acuminate to rounded at apex, abaxially sparsely to glabrate; ultimate branches of infructescence in umbels of 4–6 (~8) flowers; bracts (and often bracteoles) reflexed or revolute; sepals revolute at apex; petals yellow; samaras 40–50 × 12–21 mm. Evergreen lowland forest, 50–200 m; Amazonas (Cacho Yaguar, Rio Caucaíque, Rio Cata- niapo, Rio Cunumusiños, Rio Vautis, Tamatal- ma). Amazonian Colombia, Guayana, French Guiana, Amazonas.


Shrub or slender tree 1–3 m tall; petals 5–10 mm long, biglandular at base; blade of larger leaves 3–9 × 2–5 cm, elliptic or slightly obovate, mostly obtuse or rounded and often spinulose at apex, rarely acute, serrate or appressed-tomentose or almost glabrous abaxially with the hairs nearly or quite sessile; infructescences an umbel of 3–11 flowers terminating a leafy shoot; pedicels sessile; sepals appressed in azellia; 4 lateral petals brown-maroon, posterior petal white or pale yellow; samaras 13–30 × 8–14 mm. Rocky tepui slopes and marshy meadows, 1250–1600 m; Amazonas (Cerro Autana, Cerro Cuan, Cerro Sipapel). Endemic. Fig. 95.

Fig. 95. *Heteropterys steyermarkii*

Woody vines, sometimes shrubby. Leaves usually bearing glands distally on petiole or against abaxial base of midrib, and often on margin of blade, the tertiary veins often strongly parallel; stipules borne on petiole, from slightly above base to near apex, usually long and subulate. Inflorescences axillary, usually 1–several umbels of 4–many flowers, the umbels when 4-flowered often borne in a cyme; bracts and bracteoles eglandular; pedicels sessile. Anterior sepal eglandular, 4 lateral sepals biglandular or eglandular, with both forms present in some species; petals yellow, rarely red at maturity, glabrous. Stamens 30, all fertile; anthers ± alike. Ovary with the 3 carpels nearly distinct, all fertile; styles 3, inserted low on ventral face of carpels, the apex with a large internal stigma and dorsally rounded to prominently hooked. Fruit breaking apart into 3 samaras, each butterfly-shaped with 2 discrete lateral wings, these coriaceous and reduced in a few species; dorsal wing small, sometimes reduced to a crest or lost; intermediate winglets or slender projections rarely present.

Mexico, Central America, West Indies, and South America (all countries except Chile and Uruguay); at least 47 species, ca. 20 in Venezuela, 10 of these in the flora area.

Key to the Species of Hiraea

1. Abaxial leaf hairs stalked, erect, V- or T-shaped, occasionally with an admixture of V-shaped hairs (sessile with the 2 branches stiff and ascending) ....... H. ternifolia
   1. Abaxial leaf hairs (if any) nearly or quite sessile and ± appressed ........ 2
   2(1). Leaf blades abaxially very densely and persistently sericeous, the hairs usually completely concealing the epidermis and producing a golden or silvery-metallic sheen ....... H. faginea
   2. Leaf blades abaxially thinly sericeous or submentose to glabrate ....... 3
   3(2). Umbel with a globose or depressed-globose, often dark glandular cushion, 0.7–2 mm diameter, in the center between bracteoles ............. 4
   3. Umbel without a prominent central cushion, at most with a tiny obscure central body up to 0.3 mm diameter ........................................ 6
   4(3). Leaf blades at least shallowly cordate at base; limb of lateral petals 6.5–8 mm long, 7.5–9 mm wide; petals long-fimbriate with the divisions 0.3–0.7 mm long ....... H. fimbriata
   4. Leaf blades cuneate or rounded at base; limb of lateral petals 4–7 mm long and wide; petals subentire or short-fimbriate with the divisions up to 0.3 mm long ........ 5
   5(4). Lateral veins prominent abaxially, hardly or not at all raised adaxially; limb of lateral petals 5–7 mm long and wide; nut of samara 3–4 mm diameter .............................................. H. apoponensis
   5. Lateral veins not or only slightly raised abaxially, almost as prominent adaxially as abaxially; limb of lateral petals 4–5 mm long and wide; nut of samara ca. 2 mm diameter .............................................. H. tapanensis
   6(3). Leaf blades bearing obscure or prominent glands on margin, at least distally .......... 7
   6. Leaf blades with the margin eglandular ........................................ 8
   7(6). Pedicel of larger leaves 14–20 mm long; pedicels 14–28 mm long; stipules borne 5 mm or more below apex of petiole ............. H. steyermarkii
7. Petiole of larger leaves 7–11 mm long; pedicels 9–13 mm long (-15 mm in fruit), stipules borne at apex of petiole or up to 2 mm below...

H. affinis

86. Lateral veins not or only slightly raised abaxially, almost as prominent adaxially as abaxially; stipules 0.5–1 mm long...

H. sepium

87. Lateral veins quite abaxially abaxially hardly or not at all raised adaxially; stipules 1–5 mm long...

H. affinis

98. Specimen with fruits (H. celtica is not known and is not keyed here)

10. Specimens with flowers...

109. Samaras with the dorsal wing absent or represented by a rounded crest 0.2–0.45 mm high; inflorescence unbranched umbel, with 1–7 umbels in a vertical array in each axil...

H. affinis

109a. Samaras with a small but definite dorsal wing; inflorescence usually a cyme of 3 umbels, with 1–3 cymes in a vertical array in each axil, the cyme occasionally reduced to 1 umbel...

110. Blade of larger leaves up to 7.5 cm wide; stipules borne at apex of petiole or up to 2 mm below; pedicels up to 15 mm long (-15 mm in fruit)

H. affinis

110a. Blade of larger leaves 6.5–7.8 cm wide; stipules borne slightly above middle of petiole; pedicels 11–20 mm long

H. neblinensis

129a. Posterior petal glabrous; inflorescence all around margin...

H. affinis

129b. Posterior petal with the margin dentate to frimbriate but the divisions not glabrous-thickened...

131. Leaf blades cuneate at base; styles dorsally rounded or truncate at apex

H. celtica

131b. Leaf blades rounded or cordate at base; styles with a short (ca. 0.2–0.3 mm), rounded dorsal hook at apex...

H. affinis

141. Petals dentate to short-frimbriate, with the divisions up to 0.2 mm long; inflorescence an unbranched umbel, with 1–7 umbels in a vertical array in each axil; pedicels up to 11 mm long

H. affinis

141b. Petals long-frimbriate, with the divisions up to 0.4 mm; inflorescence usually a cyme of 3 umbels, with 1–3 cymes in a vertical array in each axil, the cyme occasionally reduced to 1 umbel; pedicels 9–19 mm long

H. neblinensis

Hiraea affinis Moq., Linn. Ann. 19: 133. 1847

Large woody vine; stipules 1.2–2 mm long, borne somewhat below to somewhat above middle of petiole; pedicels 4–11 mm long; blade of larger leaves 11–23 cm × 4–12 cm, rounded or cordate at base, eglandular on margin, abaxially densely tufted; 1.4–14 mm long; sepals adaxially glabrous; petals pale yellow, dentate or short-frimbriate with the divisions non-glandular; styles with a short rounded dorsal hook at apex; samaras with the wing 20–22 mm wide, 36–40 mm high, membranes not or only slightly raised abaxially, almost as prominent adaxially and represented by a rounded crest 0.3–0.5 mm high; Lowland wet forests along rivers, 50–300 m; Delta Amacuro (Rio Amacuro on the border with Guyana, east-northeast of El Palmar). Guayana, Suriname, French Guiana, Ecuador, Peru, Brazil, Bolivia.


Woody vine; stipules 0.5–1.5 mm long, borne between middle and apex of petiole, petioles (4–16–16–12) mm long; blade of larger leaves 6.6–21–3–6–8 cm, cuneate or rounded at base, eglandular on margin, axially thinly sericeous at maturity, with the lateral veins prominent adaxially and hardly or not at all raised adaxially, inflorescence 4-flowered umbel, the umbel solitary in each axil or 2 or 3 in a vertical array, each umbel with a dark glabrous hemispherical or globose cushion in center between bracteoles; pedicels 8–13 mm long; petals subtrorse or short-frimbriate with the divisions angustilanceae, the basis of lateral petals 5–7 mm long and wide; samaras with not 3–4 mm diameter, lateral wings 7–11 mm wide, 16–16–15–15 mm high, Evergreen lowland forests near rivers, 100–200 m; Amazonas (between San Fernando de Atalaia, Atalaia, and the Rio Orinoco). Amazonas, Colombia, Brazil (western Amazonas).


Woody vine; stipules 1.6–1.5 mm long, borne between middle and apex of petiole; pedicels 10–18 mm long; blade of larger leaves 5.2–6 × 5–12 cm, connate at base, eglandular on margin, axially thinly sericeous to glabrate at maturity; inflorescence a 4-flowered umbel, the umbel solitary in each axil or 2 or 3 in a vertical array; pedicels 16–22 mm long, pubescent abaxially glabrous; petals all frimbriate with the divisions non-glandular; styles dorsally rounded or truncate at apex; samaras unknown. Mixed wet forest and scrubs savannas, 100–1500 m; Amazonas (Curro Cauca, Curro Sipapo). Endemic.


—Hiraea faigiana DC., Prodr. 1: 590. 1824

Woody vine, occasionally shrub; stipules 2.5–3.5 mm long, borne between middle and apex of petiole; pedicels 0.5–11 mm long; blade of larger leaves (6–7–8–16–20) × 3–6–8 cm, rounded or subcordate at base, usually bearing several small glandular papillae on margin, abaxially densely and usually persistently sericeous, the straight, appressed hairs giving lamina a golden or silver-metalllic sheen; inflorescence a single axillary cyme of 3–4-flowered umbels, sometimes reduced to a single umbel; pedicels (7–9–11–15) mm long; posterior petal glandular-frimbriate all around margin; samaras with lateral wings 13–20 mm wide, 20–30 mm high, membranous. Moist lowland tropical forests, 200–300 m; Bolivar (Altaplacitio de Nura). Lara, Sucre, northeastern Mexico, Central America, Trinidad, and all countries of South America except Chile and Uruguay.

See discussion below under Hiraea faigiana. The specimens that I have called H. faigiana ssp. lat. came from Delta Amacuro (Rio Amacuro) and Bolivar (upper Rio Caura, Rio Vainam).


Woody vine, occasionally shrub; stipules 2.5–5 mm long, borne between middle and apex of petiole; pedicels 0.5–11 mm long; blade of larger leaves (6–8–16–20) × 3–6–8 cm, rounded or subcordate at base, usually bearing several small glandular papillae on margin, abaxially densely and usually persistently sericeous, the straight, appressed hairs giving lamina a golden or silver-metalllic sheen; inflorescence a single axillary cyme of 3–4-flowered umbels, sometimes reduced to a single umbel; pedicels (7–9–11–15) mm long; posterior petal glandular-frimbriate all around margin; samaras with lateral wings 25–5 mm wide and high, trapezoidal or rectangular, entire or lobed, usually ciliate, unregularly reduced. Riparian forests, coastal lowland to rarely as high as 200 m; Delta Amacuro (Cabo Arayaq, Cape Guiniquitas, Curuapo, Bolivar (Rio Caura, Río Vainam, Río Paragua), Amazonas (Isla Ratán, Río Casiquiare, Río Mayo, Río Moroncito, Río Ocamo, uper Rio Orinoco, Río Sipapo, Apure).
parently not known from northern Venezuela; Nicaragua, Costa Rica, Panama, Lesser Antilles, Colombia, Guyana, Surinam, French Guiana, Brazil (north of the Amazon). Fig. 98.

Hirase fagiola and H. fagioliforin are very similar to one another, presumably closely related. Most specimens can immediately and unequivocally be assigned to one or the other, because in H. fagiola the leaf blades are abaxially densely and persistently metatropic-sericeous with the hairs completely hiding the epidermis, and in H. fagioliforin the leaf blades are abaxially glabrous (or very early glabrate) except for the persistently sericeous midrib and sometimes the lateral veins. Moreover, the samara in H. fagiola is usually a corticulate and reduced, often very irregular in form, suggesting adaptation for dispersal by water; most fruiting collections of H. fagioliforin have membranous, butterfly-shaped samaras obviously adapted for dispersal by wind. The two species have overlapping ecological requirements, but H. fagiola seldom comes much above sea level or away from rivers while H. fagioliforin is much more likely to be found in upland forests where one could expect a plant that has retained dispersal by wind. H. fagioliforin has a much wider geographic range than H. fagiola, and through much of their ranges the two species are allopatric, e.g., H. fagioliforin is common in Peru, Bolivia, and Paraguay, while H. fagiola is less common in southern Venezuela and adjacent Brazil (Mato Grosso) and northeastern Argentina. Their ranges do overlap, especially in the Venezuelan Guayana and the Guianas, and in those areas they seem to hybridize. I do not consider that sufficient evidence to combine two taxa that are mostly distinct and distinctive, but the occasional intermediate plants do pose a problem for the users of this flora, because they will not key well. The putative hybrids have been found on the Rio Caura and near the Rio Cuyuní in Bolivar, in areas where "typical" H. fagiola occurs. When the leaf blades are abaxially very thinly sericeous, so as to resemble most closely H. fagiola, I am calling the intermediate H. fagiola var. sens. int.

Hirase fimbrilata W.B. Anderson, Mem. New York Bot. Gard. 2: 245. 1918. Woody vine, occasionally described as a shrub 3-4 m long, leaflets 1-2 mm long, borne between middle and apex of petiole; pedicels 4-10 mm long; blade of larger leaves 22-24 x 8-10 mm, broadly ovate-rounded, rounded on apex, pointed at base, margin with the divisions a glandular-thickened, especially proximally; mature samara 10-12 mm long, 200 mm; Bolivar (east of Las Chicharras, Rio Anoi). Endemic.

The collection from near Las Chicharras is sterile and has much larger leaves than the type, and may represent a different species; more collections are needed to shed light on this problem.

Hirase tenuifolius Steyerm., Flora, Bot. 28: 293. 1902. Woody vine, rarely described as a small tree; stipules 0.5-1 mm long, borne at or above middle of petiole; pedicels 6-15 mm long; blade of larger leaves 6-15 x 5-6-7 cm, cuspidate or rounded at base, eglandular on margin, loosely sericeous or subsericeous to glabrescent except persistently sericeous on abaxial midrib, with lateral veins not or only slightly raised abaxially, almost as prominent adaxially as abaxially; inflorescences 3-4-flowered, umbel with the umbellets solitary in each axil or 2-5 in a vertical array, each umbel without a prominent cushion in center, sessile or short-bracted, rarely with a small glandular knob; pedicels 4-15 mm long; petal crenate or short-fimbriate with the divisions nodulaglandular; the limb of lateral petals 4-5 mm long and wide; samara with rust ca. 3 mm diameter; the lateral wings 10 mm wide, 13-14 mm high. Most montane to lower montane forests, often gallery forests in areas of savannas, 500-700-1800 m; common in southeastern Bolivar (Gran Sabana and Matozaco del Chichamada), Amazonas (Corro Aratikayepo, Corro Parra). Occurs. [Fig. 99]


Woody vine forming thickets, shrub to 2.5 m tall or a small tree to 5 m tall; leaves urinate or decussate; stipules 1.5-2.5-6 mm long, borne from base above to near apex of petiole; pedicels 5-11-19 mm long; blade of larger leaves 7-18 x 12.5-15 cm, broadly ovate-rounded or rounded at base, bearing several small glands on distal margin, adaxially densely velutinose with V-shaped hairs; inflorescence usually an axillary cyme of 3 or 7 4-flowered umbels, sometimes a single umbel, sometimes 2 cymes, one above the other; pedicels 10-30-35 mm long; posterior petal usually glandular-fimbriate all around margin; samara with the lateral wings 13-20 mm wide, 22-30 mm high, membranous. Open, dry forests on granite outcrops, 50-400 m; Bolivar (Rio Orinoco lowlands southward from Caurao and Bolivar) and Amazonas (Rio Orinoco and tributaries north of Rio Saparo). Anazalquin, Apure; Colombia (Vichada: Rio Meta).


Large woody vine; stipules 2-3 mm long, borne slightly above middle of petiole; pedicels 9-19 mm long; blade of larger leaves 13.5-31 x 8.5-17 cm, shallowly cordate at base, eglandular on margin, abaxially mostly glabrate at maturity or with scattered hairs especially on midrib; inflorescence a cyme of 3-4-flowered umbels, sometimes reduced to a single umbel with the umbellets solitary in each axis or 2 or 3 in a vertical array, each umbel without a prominent cushion in center, sessile or short-bracted, rarely with a small glandular knob; pedicels 4-15 mm long; petal crenate or short-fimbriate with the divisions nodulaglandular; the limb of lateral petals 4-5 mm long and wide; samara with rust ca. 3 mm diameter; the lateral wings 10 mm wide, 13-14 mm high. Most montane to lower montane forests, often gallery forests in areas of savannas, 500-700-1800 m; common in southeastern Bolivar (Gran Sabana and Matozaco del Chichamada), Amazonas (Corro Aratikayepo, Corro Parra). Occurs. [Fig. 99]


Woody vine forming thickets, shrub to 2.5 m tall or a small tree to 5 m tall; leaves urinate or decussate; stipules 1.5-2.5-6 mm long, borne from base above to near apex of petiole; pedicels 5-11-19 mm long; blade of larger leaves 7-18 x 12.5-15 cm, broadly ovate-rounded, rounded at base, bearing several small glands on distal margin, adaxially densely velutinose with V-shaped hairs; inflorescence usually an axillary cyme of 3 or 7 4-flowered umbels, sometimes a single umbel, sometimes 2 cymes, one above the other; pedicels 10-30-35 mm long; posterior petal usually glandular-fimbriate all around margin; samara with the lateral wings 13-20 mm wide, 22-30 mm high, membranous. Open, dry forests on granite outcrops, 50-400 m; Bolivar (Rio Orinoco lowlands southward from Caurao and Bolivar) and Amazonas (Rio Orinoco and tributaries north of Rio Saparo). Anazalquin, Apure; Colombia (Vichada: Rio Meta).
14. **Jubelina** A. Juss. in Delesse., Icon. Sert. Pl. 3: 19, pl. 32. 1837 [1838].

Woody vines. Leaves with the petiole and glandular stipules small, borne on base of petiole; blade bearing impressed abaxial glands, the lateral veins interconnected by 2 parallel tertiary veins. Inflorescences axillary and terminal, decumbent, thyrsiform, containing much-reduced bract-like leaves below the floriferous bracts, the flowers borne ultimately in umbels of 4 or corymbe of 6, bracts and bracteoles large, pubescent on both sides, persistent. Sepals narrowly ovate, oblong, or obate, the anterior glandular, the lateral 4 each biglandular or (in our species) bearing 1 large abaxial gland, petals yellow or (in our species) pink or pink and white. Stamens 10, globose. Ovary of 3 carpels adnate to a common axis, styles 3, the apex with a large internal stigma and dorsally truneate or short-hooked. Fruits breaking apart into 3 samaras, each bearing a semicircular dorsal wing and 2 large lateral wings confluent at base, each lateral wing with a sterile cavity in its base parallel to the fertile locule.

Central America, Colombia, Venezuela, Suriname, French Guiana, Ecuador, Peru, Brazil; 6 species, 2 in Venezuela, both in the flora area.


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**Key to the Species of Jubelina**

1. Stems subericeous or appressed-tomentose, the limb of hairs at right angles to the stalk; leaf blades bearing abaxially on each side 1 or 2 or occasionally 3 glands at base and 1-4 glands distally in a single row; calyx glands revolute at apex; samaras with lateral wings flat and lacking wings or winglets between them and a dorsal wing, or at most a single flat crest or winglet 1-12 mm wide parallel to dorsal wing.

   *J. magnifica*

   Woody vine; stems subericeous or appressed-tomentose; petioles 14-23 mm long; blade of larger leaves 15-18 x 7-12 cm, broadly elliptic, rounded or abruptly short-acuminate at apex, persistently velutinous to tomentose on both sides or sometimes glabrescent adaxially; bracts and bracteoles

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*Jubelina bracteosa* asst. non Mosquin *bracteosa* Griseb. in Mart., Fl. Bras. 12(1): 97. 1858.
Lophopterys 157

5¾ to completely connate. Flowers borne in a usually terminal thyrsus composed of few-flowered cincinni or dichasia or a pseudocyme; 1 or both bracteoles usually bearing 1 large gland; petals pink or yellow, entire or minutely denticulate. Stamens 10, glabrous; anthers alike, their outer locules bearing dark longitudinal wings. Ovary of 3 fertile carpels connate along a central axis; styles 3, slender and subulate with minute terminal stigmas. Fruits breaking apart into 3 dry, unwinged, 1-seeded cocci, the mericarps indehiscent or slightly dehiscing along the keel but not enough so to release the spherical seed.

Costa Rica, Venezuela, Brazil, Bolivia; 6 species, 1 in Venezuela.


Shrub or small tree 1–4(–6) m tall; stipules (6–)7–10 mm long; petals (10–)14–30 mm long, usually bearing 2–4 glands near middle; blade of larger leaves 12–30 × 4–10 mm, usually bearing few to many small abaxial glands; inflorescence 13–35 cm long, usually pendulous, the cincinni comprising 1–6(–10) flowers, 1 bracteole of each pair terminating in a sessile or stalked gland; sepals all biglandular; petals yellow; ovary glabrous; ovoid 7–9 × 3–4 mm, glabrous, subpetiolate, the proximal half filled with serochnysa, the distal half containing the seed. Along rivers, 100–300 m; costa rica (from Isla Ratón and La Esmaralda on the upper Río Orino to San Simón de Cocoy on the Río Negro, Amazonian Brazil and Bolivia. *Fig. 101.*

16. LOPHOPTERYS A. Juss. in Deless., Icon. Pl. 3: 18. pl. 29. 1837 [1838].

Woody vines or shrubs. Leaves densely and persistently sericeous abaxially; stipules minute or absent. Inflorescence paniculate (simple in 1 species not found in the flora area), the flowers borne ultimately in pseudocymes. Anterior sepal eglandular; the lateral sepals rarely eglandular, usually each bearing a single, very large, circular or elliptic, usually lanceolate gland; petals yellow, glabrous or very sparsely sericeous abaxially. Stamens 10. Ovary of 3 free carpels borne on a short pyramidal torus; styles 3, stout, with large internal stigmas. Fruits breaking apart into 3 samaras, each bearing a relatively short, filabellate or trapezoidal wing and 2 much longer, narrow, forward-pointing lateral wings 3 or more times as long as wide (lateral wings lacking in 1 species not found in the flora area).

Venezuela, Guyana, Suriname, French Guiana, Peru, Brazil, Bolivia; 8 species, 2 in Venezuela, both in the flora area.

Key to the Species of Lophopterys

1. Peduncles none or up to 1 mm long in fruit; blade of larger leaves 16–35 × 10–23 cm, obovate; petiole of larger leaves 20–30 mm long; pseudocymes containing 10–50 flowers; samaras with nut 9–11 mm diameter, lateral wings 45–62 × 10–18 mm
   1. Peduncles well developed, 1.7–9 mm long; blade of larger leaves 8.9–19.8 × 3.4–10 cm, elliptic or orbicular (i.e., widest at or below the middle); petiole of larger leaves 10–18–22 mm long; pseudocymes containing (2–)4–28 flowers; samaras with nut 3.4–4.5(–6) mm diameter, lateral wings 15–26 × 4–7 mm
      L. euryptera


Woody liana up to 35 m long. Evergreen lowland to lower montane forests, 50–400 m;

Dolca Amazonica (Rio Azoure, Rio Grande east of El Palmar), Bolivar (upper Río Cayuan).

Northwestern Guyana. *Fig. 102.*
Lophopterys inapa W.R. Anderson, Coetr. Univ. Michigan Herb. 17: 46. 1990. Woody vine or shrub up to 4 m tall. Evergreen lowland forests, roadside thickets, and open savannas among sandstone outcrops, 100–200 m; Amazonas (southeast of San Fernando de Atalaia), Amazonian Peru, Brazil, and Bolivia.


Malpighia emarginata DC., Prod. 1: 578. 1824. —Acerola, Cereza, Semeruca. Malpighia paniculiflora S. Mex. non L. 1762. Shrub or small tree 2–6 m tall; petals (1–)2–4 mm long; blade of larger leaves 2.5–7 x 1.4–3.3 cm (up to 10 x 3 cm in cultivated plant), ovate, elliptic, or obovate, bearing 2–4 abaxial glands in the proximal third, sparsely sericeous to glabrous; petals pink or purplish (in age); styles with distinctly internal stigmas, dorsally truncate or apiculate at apex; fruits red, up to 17 x 22 mm. Dry areas with xerophytic vegetation, near sea level to 200 m; Delta Amacuro (Turubita, cultivated), Bolivar (Ciudad Bolivar, Las Trincheras, Parque Chachamoy near Rio Careo, Timororo, probably all cultivated or escaped from cultivation). Common in the coastal lowlands of northern Venezuela, where perhaps native, and elsewhere cultivated; apparently native from Mexico to Honduras, elsewhere in Central America and the West Indies probably escaped from cultivation, apparently native in Colombia? and coastal Ecuador.

Widely cultivated for the edible fruit, rich in vitamin C, and readily naturalized.

Malpighia glabra L., Sp. Pl. 429. 1753. —Cereza, Guayakito roseo, Semeruca. Malpighia paniculiflora L., Sp. Pl. ed. 2, 699. 1762. Shrub or small tree 1–6 m tall; petals 0.5–3 mm long; blade of larger leaves 5–10 x 1.5–5 cm, narrowly to broadly elliptic or ovate, bearing (0–)3–4 abaxial glands in proximal fourth, glabrous or very sparsely sericeous; petals pink or pale purple; styles truncate at apex with the stigma slightly internal or apparently terminal; fruits red, 7–10 x 10–13 mm. Relatively dry deciduous or semi-deciduous forests, occasionally in the understorey of lowland evergreen forest, 200–900 m; Bolivar (vicinity of La Paragual, Northwestern Venezuela from China to Miranda; U.S.A. (southern Texas), Mexico, Central America, Greater Antilles, Colombia, Ecuador, Peru (cultivated, native too?). —Fig. 105.
18. MASCAGNIA (Retero ex DC.) Colla, Hortus Rupel. 85. 1824. — Hinea sect.

Mascagnia Retero ex DC., Prodr. 1: 365. 1824.

Vines, mostly woody (a few species from outside the flora area are shrubs or small trees). Leaves usually bearing glands; stipules small, distinct, triangular, borne between petioles or on base of petiole. Inflorescence mostly axillary or terminal pseudoracemes, sometimes congested and reduced to form corymbs or umbels, single or grouped in panicles; floriferous peduncles usually well developed. Petals yellow or yellow and orange or yellow turning red, or pink, lilac, or white. Stamens 10; anthers ± alike. Ovary with the 3 carpels connate along a central axis, all fertile; style 3, the apex usually with a large internal stigma and dorsally rounded, truncate, acute, or short-hooked; stigma nearly or quite terminal in a few species. Fruits breaking apart into 3 samaras, each samara having its largest wings lateral, 2 discrete wings or a single wing continuous at the base or at both base and apex; dorsal wing small, sometimes reduced to a crest or lost; intermediate winglets present or absent; wings reduced or rudimentary in a few species.

Central America, West Indies, Mexico, South America (all countries except Chile and Uruguay); ca. 60 species, 16 in Venezuela, 15 of these in the flora area.

As I have noted in previous publications, Mascagnia as recognized here is a heterogeneous and probably unnatural genus, some of whose species will very likely have to be removed eventually to segregate genera. The species in our flora that will surely remain in Mascagnia even after that segregation are M. cynanchifolia, M. dissimilis, M. divaricata, M. eggersiana, M. ovatifolia, M. schankei, and M. septum.

Key to the Species of Mascagnia based on flowering material

1. Petals axially ± densely and persistently tomentose or sericeous .......................... 2
2. Petals glabrous or bearing a few axillary hairs .................................................. 9
3(1). Margin of bracteoles and sepals with a row of stalked ciliate or capitate glands ................................................................. 5
3(2). Margin of bracteoles and sepals eglandular .................................................. 4
4(2). Leaf blades sori-separate or with sessile appressed hairs, glabrata at maturity or the hairs persistent abaxially and often on adaxial midrib .................................................. M. glandulifera

5. Leaf blades velutinous to glabrata adaxially, persistently velutinous abaxially with the prominently stalked hairs Y- or V-shaped .................................. M. serrulatiffolia
6(2). Petals lilac or pink; leaf blades axially persistently sericeous and bearing (1–)several small glands in a row parallel but set in from the margin; sepals completely concealing petals in bud, revolute in anthesis; ultimate units of inflorescence ± elongated pseudoracemose 2–10 cm long ........................................ M. macrodolosa

7. Petals yellow; leaf blades nearly or quite glabrata at maturity, bearing many tiny impressed glands on margin or on adaxial surface of revolute margin, abaxially eglandular between midrib and margin, sepals leaving outermost petal exposed during enlargement of bud, appressed in anthesis; ultimate units of inflorescence congested or corymbose pseudoracemes up to 1.5 cm long .................................................. M. sineraeriifolia

8(5). Petals pink, lilac, or white, or a combination of those colors ................................ 8

9. Petals yellow or yellow turning red in age ........................................................... 10

10. Inflorescence "simple," i.e., each pseudoraceme axillary to a well-developed vegetative leaf; bracteoles eglandular or 1 or both bearing 1 or 2 small abaxial glands ......... 7

11. Inflorescence usually "compound," i.e., pseudoracemes grouped in terminal or axillary panicles containing only tiny bracts or much-reduced leaves; bracteoles eglandular .................. 8

12. Leaf blades axially sericeous, usually soon glabrata; anthers glabrous; flowers ± evenly distributed along axis of pseudoraceme; inflorescence sericeous .................................................. M. schankei

13. Leaf blades persistently velutinous adaxially; anthers sericeous; flowers mostly congested in distal half of axis of pseudoraceme; inflorescence tomentose (petal color unknown; placed here on the basis of similarity in other characters to M. schankei) ........................................ M. cynanchifolia

14. Anthers pilose; dried leaf blades smooth on adaxial surface, the reticulum not raised and hardly visible; petioles usually bearing 2–4 glands near middle, or eglandular .................................................. M. divaricata

15. Anthers glabrescent (rarely very sparsely pilose); fine reticulum prominent on adaxial surface in dried leaf blades; petioles eglandular ................. 9

16. Leaf blades with a discolor ed band (0.5–)1–2 mm wide all around margin, the band reddish in dried leaves; pedicels quite glabrous or initially sericeous at apex but usually soon glabrate; petals 11–20 mm long; ovary and immature fruit sparsely to moderately sericeous with straight appressed hairs .................................................. M. dissimilis

17. Leaf blades uniformly green; pedicels initially loosely sericeous their whole length (sometimes only sparsely so), eventually ± glabrescent;
petioles 8–11(–18) mm long; ovary and immature fruit densely subo- 
thaxial, the hairs so dense and appressed as to completely conceal 
epidermis and usually give leaf a metallic sheen; glands of leaf blade, if 
axial, borne on abaxial surface between midrib and margin ................. 13

10. Mature, full-sized leaves abaxially glabrate or variably sericeous, 
velutinuous, or tomentose, but the hairs never dense enough to com- 
pletely conceal epidermis; glands of leaf blade, if present, borne on 
axial surface between midrib and margin ........................................ 11

11(10). Petioles biglandular near or above middle; anthers 0.5–0.7 mm long, gla-
braus; calyx glands (if present) 0.5–1.5 mm long; petals with limb up to 
2.5 mm long; floriferous bracts eglanudar ........................................... M. poepigianii

11. Petioles biglandular at or just above base; anthers 1–1.5 mm long, usually 
sericeous between locules and bearing a few abaxial hairs; calyx glands 
1.7–2.5 mm long; petals with limb 3.5–5 mm long; floriferous bracts of- 
ten prominent ......................................................... M. natalensis

12(11). Leaf blades abaxially golden- or silvery-sericeous, with the reticulum ± 
prominent ......................................................... M. stannea

12. Leaf blades abaxially dark brown-sericeous, with the reticulum ± ob-
scured by outer layer of hairs ............................................................... M. castanea

13(10). Sepals completely concealing petals until flower opens, revolute after-
wards; calyx glands 10 (all 5 sepals biglandular); petals yellow turning 
red in age; inflorescence densely and persistently sericeous or to-
mentose-sericeous with mostly white hairs, the overall aspect gray
.............................................................................................................. M. lusneri

13. Sepals leaving outermost petals(s) exposed during enlargement of bud, sup-
pressed after flower opens; calyx glands 6 (lateral 4 sepals biglandular, 
ante
or sepal eglanudar); petals persistently yellow; inflorescence bearing yellowish, brownish, or reddish hairs, or glabrate, the overall 
aspect green or brown ....................................................................... 14

14(13). Leaf blades abaxially to subsericeous, occasionally glabrate, but the dark brown or reddish hairs persistent at least on midrib; 
stems velutinuous to glabrescent in age; petiole of larger leaves 8– 
18–220 mm long; pedicles sericeous or subvelutinuous, with some hairs 
persistent in fruit at least on distal half; ovary densely tomentose-seri-
ceous; samaras sparsely sericeous ..................................................... M. ageriana

14. Leaf blades abaxially glabrous or soon glabrate; stems soon glabrate; petio-

e 8–18 mm long; pedicles glabrous; ovary sparsely sericeous; samaras 
soon quite glabrate .......................................................... M. sepium

Key to the Species of Masogonia based on fruiting material

1. Lateral wings of samaras discrete, i.e., divided to nut at base and apex 

2. Lateral wings of samaras continuous at base, continuous at apex or incised 
part way or completely to nut .................................................... 6

2(1). Mature, full-sized leaves thinly sericeous to glabrate abaxially, the hairs 
never dense enough to completely conceal epidermis ..................... 3

2. Mature, full-sized leaves persistently golden-, silvery-, or brown-sericeous 
abaxially, the hairs so dense and appressed as to completely conceal 
epidermis, usually giving leaf a metallic sheen .......................................... 4

3(2). Leaf blades abaxially persistently sericeous and bearing (1–)several small 
glands in a row parallel to but set in from margin; ultimate units of in-
florescence ± elongated pseudosepalae 2–(9–15) cm long .................. M. macrodonia

3. Leaf blades nearly or quite glabrate at maturity, bearing many tiny im-
pressed glands on margin or on adaxial surface of reductio margin, 
abaxially eglanudar between midrib and margin; ultimate units of in-
florescence congested or corymbose pseudosepalae up to 1.5 cm long
.............................................................................................................. 5

4(3). Petioles biglandular near or above middle; calyx glands (if present) 0.5– 
1.5 mm long; floriferous bracts eglanudar ............................................. M. poepigianii

4. Petioles biglandular at or just above base; calyx glands 1.7–2.5 mm long; 
floriferous bracts often bearing 1 or 2 large glands, or eglanudar ....... 5

5(4). Leaf blades abaxially golden- or silvery-sericeous, with the reticulum 
being 1 or 2 large glands, or eglanudar .................................. 6

5. Leaf blades abaxially dark brown-sericeous, with the reticulum ± ob-
scured by outer layer of hairs ............................................................... M. castanea

6(1). Margin of bracteoles and sepals with a row of stalked clavate or capitular 
glands ............................................................................................. 7

6. Margin of bracteoles and sepals eglanudar ........................................ 8

7(6). Leaf blades originally sericeous on both sides with sessile appressed 
hairs, glabrate at maturity or the hairs persistent abaxially and often 
on adaxial midrib .......................................................... M. glandulifera

7. Leaf blades velutinuous to glabrate abaxially, persistently velutinuous abax-
ially with the prominently stalked hairs T- or V-shaped .................. M. surinamensis

8(6). Calyx glands 10 (all 5 sepals biglandular) (species unknown in fruit, but 
placed here on the basis of fruits known in closest relatives) .......... M. lusneri

9. Calyx glands 8 (lateral 4 sepals biglandular, anterior eglanudar) ......... 9

9. Samaras with lateral wing entire at apex or margined or incised part-
way or almost to nut and connate with dorsal wing; torus after fall of 
samaras surrounded by a 3-lobed disciform outgrowth of the recep-
tacle; sepals appressed in anthesis .................................................. 10

9. Samaras with lateral wing incised to nut at apex and free from dorsal 
wings; torus not surrounded by disciform structure; sepals revolute in 
anthesis .......................................................... M. macrodonia

10(9). Inflorescence "simple," i.e., each pseudosepale axillary to a well-devel-
oped vegetative leaf; bracteoles eglanudar or 1 or both bearing 1 or 
2 small abaxial glands ......................................................................... 11

10. Inflorescence usually "compound," i.e., the pseudosepalae grouped in ter-
minal or axillary panicles containing only tiny bracts or reduced leaves; 
bracteoles eglanudar ............................................................... 12

11(10). Leaf blades initially sericeous abaxially, usually soon glabrate; flowers ± 
evenly distributed along axis of pseudosepale; inflorescence sericeous 
abaxially .......................................................... M. vatanleri

11. Leaf blades persistently velutinuous abaxially; flowers mostly congested 
in distal half of axis of pseudosepale; inflorescence tomentose
..................................................................................... M. cyanichofolia
12(10). Disciform structure surrounding fruiting torus pilose; samaras usually distinctly wider than high.............. M. oatfolia

12. Disciform structure surrounding fruiting torus glabrous; samaras higher than wide, about as high as wide, or a little wider than high........ 13

13(12). Pedicels glabrous or initially sericeous at very apex but usually sericeous glabrate.................. 14

13. Pedicels at least initially sericeous, subvelutinous, or velutinous, eventually glabrescent in some species but with some hairs persisting, especially on distal half........ 15

14(13). Leaf blades cordate at base, green and often crispate at margin; petioles 3-4 mm long.............. M. eugeniaeana

14. Leaf blades cuneate to rounded at base, smooth at margin and with a discolored band (0.5-1)2 mm wide, the band reddish in dried leaves; petioles 11-20 mm long........... M. dissimilis

15(13). Leaf blades persistently velutinous or tomentose subaxially; the dark brown hair is occasional or glabrescent but hairs persistent on midrib; hairs of inflorescence dark brown or reddish; petiole eglandular; leaf blades rounded or cordate at base.............. M. quinum

15. Leaf blades at maturity sparsely sericeous to glabrate, the hairs (if present) white or yellowish; hairs of inflorescence white or gray; petioles usually bearing 2-4 glands near middle, occasionally eglandular; leaf blades cuneate, truncate, or rounded at base, seldom cordate................................. M. diondonta


Woody vine; leaf blades abaxially dark brown-sericeous, with the reticulum obscured by outer layer of hairs; in other known characters this taxon (which has not been collected with fruit) is indistinguishable from Mascagnia stenomma, which see. Evergreen lowland forests, 100-200 m; Amazonas (Caño Yagua). Brazil (Amazonas: Rio Hertel)

This striking plant may not merit recognition, although its chestnut-brown leaves distinguish it immediately from M. stenomma. I have decided to maintain it for now in order to draw attention to it as worthy of future study, which may reveal it as more than a trivial variant. It is worth noting that Davidsd. et al. 17463 (MICH, MO), which is M. castanea, and Davidsd. et al. 17274 (MO, VEN), which is M. stenomma, were collected in the same area on the same day.

Mascagnia cymaphilafo Griseb. in Mart., Fl. Bras. 12(1): 95. 1859.

Woody vine; petioles 3-6 mm long, eglandular; blade of larger leaves 5-8.5 x 2-4 cm, adaxially persistently velutinous, abaxially persistently sericeous; inflorescence a cyme at its apex; pseudosecretes with flowers congested in distal half of axis; bracts eglandular or 1 or both bearing 1 or 2 abaxial glands; lateral 4 sepals glandular; petals probably pink, glabrous; anthers sericeous; samara suborbicular or broadly elliptic, 15-36 mm diameter, the lateral wing continuous at base, incised to half or more at apex; fruiting race, 50-100 m; Delta Amazonico (Rio Atray between the Rivers Marigata and Puerto Miranda). Fairly common in northern Venezuela (Anzoategui, Aragua, Carabobo, Distrito Federal, Falcón, Lara, Mérida, Portuguesa, Sucre); Nicaragua, Costa Rica, Panama, Colombia, Trinidad, Suriname, French Guiana, Ecuador, Peru, Brazil, Bolivia, Paraguay, Argentina.

Whether Mascagnia cymaphilafo is widely but erroneously known as M. oatfolia; see discussions in Contr. Univ. Michigan Herb. 19: 236-233. 1995.


Woody vine; petioles 11-20 mm long, eglandular; blade of larger leaves 11-25 x 6-11 cm,soon glabrate, broadly obtuse or rounded at base, with a discolored band (0.5-1)2 mm wide at margin, inflorescence pseudosecretes glandular; petals white to pink, glabrous; anthers glabrous; samaras ovate or orbicular; 20-35 x 35 mm diameter, glabrate at maturity or with a few straight oppressed hairs or not; the lateral wing continuous at base, emarginate at apex; Evergreen lowland and lower montane forests, 100-300 m; Amazonas (Rio Cuao, Rio Cumunuracu, Tamshast), Western Amazonia (Colombia, Ecuador, Peru, Brazil, Bolivia).


Hirasea oblongifolia DC., Prod. I: 585. 1824.

Woody vine; petioles 10-18 x 24 mm long, eglandular or, usually, bearing 2-4 glands near middle; blade of larger leaves 6-13 x 3.5-6.5 x 0.4 cm, thinly sericeous to glabrate at maturity; inflorescence paniculate, the axes of ultimate pseudosecretes velutinous with very short gray hairs; 4 lateral sepals glandular; petals lilac, pink, or pinkish lilac, glabrous; anthers pilose; samara suborbicular; (18-20-25 mm diameter, the lateral wing continuous at base, incised to half or more at apex; Evergreen lowland forest, ca. 100 m; Amazonas (northeast of Santarem). Northwestern Amazonia (Colombia, Peru, Brazil).


Woody vine, petioles 10-20 mm long, eglandular or glandular on distal half; blade of larger leaves 7-10 cm wide and midrib and margin adaxially soon glabrous, abaxially thinly sericeous to glabrate, eglandular or with a row of tiny glands in the midrib and margin; inflorescence pseudosecrete, the flowers borne usually in pairs, 2 or 3 pairs usually congested to form corymbs or umbels; sepals all glandular, completely concealing petals in bud, rotate in anthesis; petals yellow turning red in age, glabrate terminal or nearly so; fruits unknown. Wet disturbed lowland forests, 100-200 m;
Amazonas (San Carlos de Río Negro north to the Brazos (Cauquín). Endemic.

The fruit of *Muscaceae leucoxantha* is not known, but it can be expected to resemble that of *Muscaceae leucoxantha* Griesb. in Mart., in which the stamens are suborbicular with the membranous lateral wing continuous at the base and incised to the nut at the apex.


Woody vine, petioles 8–10–15 mm long, usually bearing 2–4 glands in 2 rows; blade of larger leaves 6–14.5–18 x 4–8–12 cm, oblong-obovate, sometimes obovate or oblanceolate, obtuse or acute at the base, rounded at the apex, the lateral wings continuous at the base and incised to the nut at the apex.


Woody vine, petioles 8–11–18 mm long, eglandular; blade of larger leaves 6–15.5 x 5–5.2 cm, entire, without glands, rounded at the base; in- florescence paniculate; pedicels initially loose, glabrous, glandular in age; petals white or pink, glabrous; sepal glabrous or slightly pubescent; stamens broadly elliptic, 17–30–37.5 cm, usually distinctly wider than high, the lateral wing continuous at the base, cuneate or shallows incised at apex; disciform structure surrounding fruit- ing torus chloé. Semideciduous forest, ca. 200 m. Brañol, near El Manteo. Apure, Aragua, Barinas, Carabobo, Distrito Fed-

deral, Falcon, Miranda, Monagas, Nueva Esparta, Portuguesa, Sucre, Táchira, Yaracuy, Zulia; Panama, Colombia, Trinid.,

This is not the species that has been called *Muscaceae ovatifolia* in all recent litera-

tures, with which has continued the miscopia-


Woody vine, petioles 7–9(–11) mm long, biglandular near or above middle; blade of larger leaves 18–30 x 5.5–9 cm, oblong-ovate or oblanceolate, obtuse or acute at the base, rounded at the apex, the lateral wing continuous at the base and incised to the nut at the apex.


Woody vine, petioles 8–11–18 mm long, eglandular; blade of larger leaves 9.5–15.5 x 5–5.2 cm, soon glabrate, rounded at the base; in- florescence paniculate; pedicels initially loose, glabrous, glandular in age; petals white or pink, glabrous; sepal glabrous or slightly pubescent; stamens broadly elliptic, 17–30–37.5 cm, usually distinctly wider than high, the lateral wing continuous at the base, cuneate or shallows incised at apex; disciform structure surrounding fruit- ing torus chloé. Semideciduous forest, ca. 200 m. Brañol, near El Manteo. Apure, Aragua, Barinas, Carabobo, Distrito Fed-

deral, Falcon, Miranda, Monagas, Nueva Esparta, Portuguesa, Sucre, Táchira, Yaracuy, Zulia; Panama, Colombia, Trinid.

This is not the species that has been called *Muscaceae ovatifolia* in all recent litera-

tures, with which has continued the miscopia-


Woody vine, petioles 7–9(–11) mm long, biglandular near or above middle; blade of larger leaves 18–30 x 5.5–9 cm, oblong-ovate or oblanceolate, obtuse or acute at the base, rounded at the apex, the lateral wing continuous at the base and incised to the nut at the apex. Evergreen lowland forests and secondary forstes, 100–500 m; fairly common in Bolivar, rare in Amazonas (Mavaca). Apure, Barinas, Monagas, Amazonas, Ecuadord, Peru, Brasil (Acre, Amazonas, Pará, and Bolív., Fig. 160.


Woody vine, petioles 8–11–18 mm long, eglandular; blade of larger leaves 9.5–15.5 x 5–5.2 cm, soon glabrate, rounded at the base; in- florescence paniculate; pedicels initially loose, glabrous, glandular in age; petals white or pink, glabrous; sepal glabrous or slightly pubescent; stamens broadly elliptic, 17–30–37.5 cm, usually distinctly wider than high, the lateral wing continuous at the base, cuneate or shallows incised at apex; disciform structure surrounding fruit- ing torus chloé. Semideciduous forest, ca. 200 m. Brañol, near El Manteo. Apure, Aragua, Barinas, Carabobo, Distrito Fed-

deral, Falcon, Miranda, Monagas, Nueva Esparta, Portuguesa, Sucre, Táchira, Yaracuy, Zulia; Panama, Colombia, Trinid.
very densely and persistently golden- or silvery-metallic-sericeous; C elongate, mostly bearing 1 or 2 large abaxial glands, or eglandular; lateral 4 sepals bilabial, the glands 1.7–2.5 mm long; petals yellow, glabrous, the limb 3.5–5 mm long; anthers 1–1.5 mm long, usually sericeous between locules and bearing a few abaxial hairs; ssa 15–30 x 20–40 mm, butterfly-shaped, the lateral wing divided to nut at base and apex, sometimes much dissected. Evergreen lowland forests, often on riverbanks or in seasonally flooded places, 100–200 m; Amazonas (Coto Yagüez, Carichó, Rio Casiquiare), Costa Rica, Panama, Colombia, Peru, Brazil, Bolivia, Paraguay.

Malagana stannae is exceedingly variable in size and shape of its leaves, but relatively consistent in its reproductive structures. The small-leaved populations in southern Brazil and Paraguay probably derive segregation, but those in northern South America are not easily separable from the type of Heteropterys stannae, which came from Costa Rica. The descriptive notes given above apply only to the plants of southern Venezuela and nearby, and do not attempt to convey the variation throughout the taxon's range. I am recognizing here two segregates from this complex, M. poepiggana and M. caustana. The former is fairly well supported by several characters and a distribution throughout western Amazonia. The latter has a much weaker claim to recognition; see the discussion under M. caustana.

Note that the oldest name for this species as it is defined here is *Rivae* laurifolia A. Juss., but the combination cannot be made in Malagana because that would create a later homonym. However, if the name *laurifolia* is transferred to a different genus, the epithet *poepiggana* should be used for it. On the other hand, if *M. poepiggana* is combined with M. stannae, the epithet *poepiggana*, which was published at the same time as *laurifolia*, can be used for it immediately, in Malagana or any other genus.


Woody vine, petioles 4–12 mm long, eglandular or bilabial in middle third; blade of larger leaves 6.5–12 x 3.7 cm, velutinous to glabrate adaxially, persistently velutinuous abaxially with T- or V-shaped hairs; bracteoles and sepals bearing a row of small stalked glands on margin; sepals leaving outermost petals exposed in bud, the lateral 4 abaxially bilabular; petals yellow, abaxially densely tomentose; sse 22–30–40 mm wide, the lateral wing contiguous at base, divided to nut at apex. Evergreen lowland forests, roadside thickets, 100–200 m; Amazonas (Paeto Ayacucho-Gavilán), Guyana, Suriname, Amazonian Brazil, Bolivia.


Woody vines, shrubs, or small trees. Leaves with the petiole eglandular; stipules minute, interpetiolary, caducous; blade bearing impressed abaxial glands or eglandular. Inflorescence tightly reddish- or brown-sericeous throughout, axillary and terminal, often decompound, containing much-reduced brisk-like leaves, the flowers borne ultimately in umbels of 4; bracts and bracteoles abaxially sericeous, adaxially glabrous or sparsely sericeous; bracts smaller than bracteoles, deciduous before maturation of fruits; pedicels well developed; bracteoles borne just below flower, large, globose-cylindrical, the inner enclosing bud until flower opens, the outer enclosing bud and inner bracteole, persistent or deciduous before maturation of fruits; pedicels absent or very short, up to 5 mm long in fruit; did flowers (not setting fruit) deciduous at base of peduncle, not at joint between peduncle and pedicel. Sepals narrowly oblong or apiculate, the anterior eglandular, the lateral 4 each bearing 2 large compressed glands, these distinct or partially to completely connate;
petals yellow. Stamens 10, dimorphic, the 5 opposite sepals differing from the 5 opposite petals in size and shape, and sometimes in pubescence. Ovary of 3 carpels adnate to a common axis; styles 3, the apex with a large internal stigma and dorsally truncate or short-hooked or pediform (i.e., with a short broad extension resembling from above the sole of a shoe), the anterior style shorter and often more slender than the 2 posterior styles. Fruits breaking apart into 3 samaras, each bearing 2 large lateral wings that are distinct or more often confluent at base, a smaller dorsal wing, and often additional wings, winglets, or crests between them or outside the lateral wings.

Panama, Colombia, Venezuela, Guyana, French Guiana, Ecuador, Peru, Brazil, Bolivia; ca. 12 species, 4 in Venezuela, all in the flora area.

Key to the Species of Mezio

1. Leaves very densely and persistently sericeous abaxially, the hairs producing a reddish or rusty brown metallic sheen
   1. Leaves glabrous or thinly sericeous to glabrate abaxially, the hairs on mature leaves not dense enough to completely conceal epidermis
   3. 2(1). Shrub or small tree 2–8 m tall; blade of larger leaves 9–17 × 6–10 cm; petals 10–15 mm long; samara 30–42 mm diameter, the central dorsal wing and 2 parallel winglets flat, the latter not connected by transverse winglets to lateral wing; lateral wing of samara nearly flat, tomentose, the hairs sinuous and spreading
      2. Woody vine; blade of larger leaves 19–29 × 10–18.5 cm; petals 20–40 mm long; samara 65–80 mm diameter, the central dorsal wing and 2 parallel winglets strongly corrugated and the latter connected to lateral wing by several transverse winglets; lateral wing of samara wrinkled or corrugated, sericeous, the hairs straight and appressed
      3. 3(1). Anthers opposite sepals densely tomentose, those opposite petals sparsely tomentose to glabrous
   3. Anthers all glabrous


Woody vine; blade of larger leaves 15.5–25 × 4.5–9.6 cm, abaxially very sparsely sericeous to glabrate; anthers opposite sepals densely tomentose, those opposite petals sparsely tomentose to glabrous; samara 55–65 mm diameter, the lateral wing continuous at base, flat to wrinkled, thinly and loosely sericeous, the central dorsal wing and 2 parallel winglets wavy or corrugated, the latter connected to lateral wing by several mostly transverse winglets. Evergreen lowland forest, Amazonas (Culebra). Amazonas Peru.

Mezio curranii is apparently little more than *M. inclinans* with hairy anthers, and it remains to be seen whether that character is sufficient basis to justify its continued recognition, but it is true that the widespread and variable *M. inclinans* is generally consistent in its glabrous anthers.


Shrub or small tree 2–8 m tall; blade of larger leaves 9–17 × 5–10 cm, abaxially very densely and persistently reddish or dark brown-sericeous; anthers glabrous; samara subbicular, 30–42 mm diameter, the lateral wing continuous at base, flat, tomentose with sinuous and spreading hairs, the dorsal wing and 2 intermediate winglets flat and parallel. Sandy savannas and adjacent gallery forest, 108–600 m; Amazonas (west of Sza Juan de Munarí), Andes. Endemic. *Ff* Fig. 107.

Fig. 107. Mezio huberi. A. Fruiting branch, ×0.53. — B. Samara, abaxial view (left), side view looking into apical notch (right), ×1.1. — C. Umbel of 4 flower buds with 2 cut off, ×2.7. — D. Flower, side view with 1 posterior-lateral petal removed, ×2.7. — E. Lateral petal, abaxial view, ×5.3. — F. Posterior petal, abaxial view, ×5.3. — G. Androsium laid out, adaxial view, the stamens opposite anterior sepals to left, ×5.3. — H. Anthers, side view, from opposite a sepal (left) and opposite a posterior-lateral petal (right), ×10.6. — I.颖果, side view, anterior style to left, ×10.6. University of Michigan Herbarium 1992.


Woody high-climbing vine; petioles 14–21/20–30 mm long; blade of larger leaves 13–20–21 x 9.5–10.5 cm, abaxially initially densely sericeous, mostly glabrescent and thinly sericeous to glabrate at maturity; anthers glabrous; samaras suborbicular or wider than high, 70–110 mm across, the latter coarsely sericeous at base, wrinkled or corrugated, thinly sericeous, the central dorsal wing and 2 parallel wings strongly corrugated, the latter connected to lateral wing by several corrugated transverse winglets. Evergreen lower montane forests, especially along rivers, 200–1000 m, Bolivia (east of 60°W, from Upata and Rio Grande south to Rio Igualar, and upper Rio Cuaro at 64°W), Amazonas (scattered localities from Puerto Ayacucho to Sierra Parima). Curahuaro, Panamá, Colombia, Guayana, French Guiana, Amazonas Ecuador, Peru, Brazil.

See discussion of Bernardi 7170 under *Mezia rufa*.

**Mezia rufa** W.R. Anderson, Mem. New York Bot. Gard. 92: 234. 1981. Woody vine; petioles 20–40 mm long; blade of larger leaves 19–29 x 10–18.5 cm, abaxially densely and persistently metallic-sericeous with the hairs usually giving blade a rusty brown or reddish appearance; anthers glabrous; samaras 45–60 mm diam., the lateral wing continuous at base or incised to nut, wrinkled or corrugated seri-cose with hairs straight and tightly appressed, the central dorsal wing and 2 parallel winglets strongly corrugated, the latter connected to lateral wing by several corrugated transverse winglets. Evergreen lowland forests, 100–300 m; Amazonas (Marua to Yavita, base of Sierra de la Neblina). Brazil (Amazonas: Rio Maparamaco, Rio Negro), Peru (Loreto).

*Mezia rufa* was described to accommodate plants with very large, persistently sericeous leaves. In characters of their flowers they resemble *M. inclinata*. The fruits of *M. rufa* are not well known, they seem to be mostly smaller than in *M. inclinata*, probably reflecting a shift toward dispersal by water, but they have complicated intermediate ruffles in *M. inclinata*. The leaves of *M. inclinata* are often densely sericeous at first, but usually soon glabrescent and at most thinly sericeous abaxially at maturity, although occasionally the smaller leaves near the inflorescence are persistently sericeous. In one collection from Rio Grande in northeastern Bolivia (Bernardi 7170 [G, MER, MICH]) the few leaves present, subtending branches of the inflorescence, are small but abaxially densely and persistently sericeous. Its samaras resemble those of *M. inclinata*. Given the small size of the leaves and the location, I suspect that Bernardi 7170 represents *M. inclinata* rather than *M. rufa*, if larger leaves had been collected they probably would have been glabrate.

20. **PTERANDRA** A. Juss. in A. St.-Hil., Fl. Bras. Merid. 3: 72. 1832 [1833].

Shrubs or trees. Leaves often crowded at tips of branchlets, eglandular (except for tiny angular translucent dots often present in blade); stipules intras and epipetalar, basally to completely connate. Inflorescence reduced to fasciculate clusters in axils of leaves or bracts or above leaf scars; bracts and bracteoles eglandular; pedicels sessile; petals abaxially sparsely to densely sericeous on claw and in center of limb, often persistent in fruit. Stamens 10; anthers glabrous, the outer locules bearing intransverse longitudinal wings. Ovary of 3 distinct carpels; styles 3, attached ventrally or subapically, slender and subulate with minute terminal stigmas. Fruit comprising up to 3 dry indehiscent cocci with a papery exocarp and a moderately thick, corneous but not bony endocarp.

Panama, Colombia, Venezuela, Guyana, Brazil, Bolivia; 14 species, 3 known or expected in Venezuela, all of these in the llanos area.


Key to the Species of *Pterandra*

1. Stipules axially glabrous even in bud (but often with a sericeous patch at point of attachment to petiole); blade of larger leaves 9.5–14 cm long; bracts and bracteoles triangular, 1.2–1.5 x 1–1.5 mm; sepals strongly revolute

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2. Stipules initially densely sericeous axially, the hairs persistent or deciduous at maturity; blade of larger leaves up to 9.5 cm long; bracts and bracteoles linear or narrowly triangular, 1.7–3 x 0.4–1.5 mm; sepals appressed or slightly recurved

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2(1). Leaf blades white or yellow axially, bearing scattered, dark red or brown, short (up to 0.7 mm), straight, sessile hairs; lateral veins of leaf blade flush with abaxial surface or prominent; petioles 13–27 mm long; anthers wings 0.4 mm wide

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2(2). Leaf blades light green axially, densely brown or white-sericeous, the hairs up to 1.2 mm long, straight to somewhat serpentine, sessile or short-stalked; lateral veins of leaf blade prominently raised axially; petioles 3–13 mm long; anthers wings 0.2 mm wide

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2. *P. flavescens*
Shrubs or small tree 2–10 m tall; stipules 3.5–4.5 mm long; 4–8–rayed corymbose, axially densely sericeous; pedicels 15–27 mm long; leaf blades 5–9.8 × 2–5 cm, axially white or yellow and very sparsely sericeous; bracts and bracteoles linear or narrowly triangular, 1.7–5 × 0.6–1.3 mm; sepals all bilocular, appressed or slightly recurved; petals cream or pale yellow; anther wings 0.4 mm wide. Tepui meadows and boggy areas along river, ca. 1500 m, Amazonas (Cariri-Sipapo). Endemic. Fig. 109.

Tree up to 20 m tall; stipules 3–7 mm long, nearly to completely connate, axially glabrous or with a sericeous patch at base; petals 8–15 mm long, blade of larger leaves 9.5–14 × 3.5–6 cm; bracts and bracteoles triangular, 1.2–1.5 × 1–1.5 mm; sepals all bilocular, strongly revolute; petals greenish yellow; anther wings 0.2 mm wide. Known only from the type, collected in mixed evergreen forest below 762 m on Mt. Ayanganna in western Guyana; to be expected in La Gran Sabana of southeastern Bolivar.

Shrub or tree 2.5–10(–15) m tall; stipules 3–4 mm long, completely connate or notched at apex, axially densely sericeous to glabrescent; pedicels 3–13 mm long; leaf blades 3–8.5 × 1.6–4.3 cm, axially light green and densely sericeous; bracts and bracteoles linear, 1.3–3 × 0.7–1 mm; sepals all bilocular or all eglundular, appressed; petals white to greenish white becoming pale yellow in age; anther wings 0.2 mm wide. By rivers in forests, 100–600 m, northwestern and eastern Bolivar (Aparatu-tupi, Ayaru-tupi, Coro Bolivar, Rio Ambutoz, Rio Cerrito, Rio Cauri, Western Guyana).


Shrubs or trees, the stems often containing white latex. Leaves bearing impressed glands in blade, axially at base and sometimes distally, axially near apex; stipules intra- and epispelletal, connate. Inflorescence terminal, a raceme of short 1–several-flowered cincinni, 1 bracteole often bearing 1 large gland; petals pink or white. Stamens 10, the anthers unwinged, the connective shorter than the lobes. Carpels 2 or 3, connate along a central axis, each bearing a stout, united style with the broad terminal stigma often becoming subulate or bilobed in anthesis. Plants morphologically gynodioecious but functionally dioecious, the pistillate flowers bearing flat unopened anthers with aborted pollen, the apparently bisexual flowers bearing large polliniferous anthers and a small ovary that does not mature into a fruit. Fruits breaking apart into 2 or 3 dry, unwinged, smooth, indehiscent, 1-seeded cocci bearing the persistent styles.

West Indies, Central America, and northern South America (Colombia, Venezuela, Guyana, Suriname, French Guiana, Peru, Brazil); ca. 6 species, 1 in Venezuela.


Tree 4–15 m tall; stipules 3–4 mm long, completely connate; petals 7–10 mm long; blade of larger leaves 6–12(–18) × 3–6.7(–2) cm, axially sparsely reddish-tomentose or subsericeous at least on midrib, bearing 2–4 impressed glands axially near base and often several distally, plus 2–4 glands on adaxial surface near apex; inflorescence a pseudocorymbose (i.e., all cincinni 1-flowered); bracts eglandular; some plants with 1 bracteole terminating in n × stalked gland; calyx bearing 8 or 9 glands; petals pink, carpels 2(3); cocci of fruit 4.5–6 × 5–4 mm. Riparian forests, near sea level to 500 m Delta Amacuro (Río Amacuro), Bolívar (Puerto Ordaz, Rio Bolamino, lower Rio Caroni, San Félix). West Indies (probably introduced), Trinidad, Guyana, Suriname, French Guiana, Brazil (Boraima). Fig. 109.
22. STIGMATHYPHYLLON A. Juss. in A. St.-Hil., Fl. Bras. Merid. 3: 48. 1832 [1833].


Woody or herbaceous vines, a few species shrubby. Leaves with the blade entire or lobed; stipules small, distinct, interpetiolar; petals often long, usually bearing 2 large glands near apex, these petioles sometimes just above blade. Inflorescence branched or more commonly a dichasium (or occasionally a small thyrse) of congested pseudosepals, these usually corymbose or umbellate. Lateral 4 sepals biglandular, the anterior usually eglandular, sepals erect or appressed in anthesis; petals yellow or yellow and red, glabrous or rarely pubescent abaxially, the limb largest in anterior-lateral pair, smaller in posterior-lateral pair, and smallest in posterior petal. Stamine 10, the filaments usually unequal in length and thickness; anthers very unequal in most species, the 4 opposite the lateral sepals often with reduced locules or sometimes sterile and the 1 opposite the posterior petal often small; anthers subequal in several species, including *S. bannisterioides* in our area. Ovary with the 3 carpels partially connate, all fertile; styles 3, the apex with an internal stigmatic area and distinctively truncate, hooked, or bearing a follicular club (folioid), the folioid symmetrical on the anterior style, 1-sided on the posterior styles. Fruits breaking apart into 3 samaras, each samara having its largest wing dorsal, thickened on the adaxial (upper) edge, the veins terminating in the thinner abaxial edge; much shorter winglets or crests present on sides of nut in some species; dorsal wing much reduced in a few species.

Mexico, Central America, West Indies, South America (all countries except Chile); 3 species, *S. bannisterioides*, also occurs in West Africa; 91 species, 11 known or expected in Venezuela, 6 of those in the Flora area. See Christiane Anderson, 1987 [Monograph of *Stigmaphyllum* (Malpighiaceae), Syst. Bot. Monogr. 51].

**Key to the Species of Stigmaphyllum**

1. Flowers (3.4–)6–6 per umbel; all styles dorsally hoisted but lacking folioid; "samaras" with dorsal wing reduced to a triangular apical crest 4–9 mm long
   2. Flowers 8–40 per umbel or pseudosepals; all styles at least the posterior 2 bearing well-developed folioids; "samaras" with an elongated dorsal wing 25–55 mm long or with dorsal wing partially encircling nut and 30–44 mm long measured from base of nut

2.1. Flowers abaxially pubescent with T-shaped hairs and bearing stipitate (nail-like) or peltate marginal glands 0.2–0.6 mm long and 0.2–0.4 mm diameter at the apex; "samaras" with nut 12–19 mm diameter, the leucum surrounded by air chambers, and dorsal wing partially encircling nut
   2. Flowers abaxially glabrous or sparsely to densely sericeous with sessile or subsessile hairs and bearing sessile marginal glands 0.2–1.5 mm diameter and sometimes filiform glands up to 1.6 mm long; "samaras" with nut 2.8–7.9 mm diameter and dorsal wing not encircling nut

3. Flowers 8–15 per umbel; petals filibrate with filibrise up to 0.6 mm long; anterior style and its opposing stamen longer than posterior styles and their opposing stamens; "samaras" with nut smooth and with I–5 prominent ribs, the wing widest at base


Vine or vine with struth al thorn 3 to 5 mm; petals up to 19 mm long; blade of larger leaves 5–11(–13) x 2.4–6.5 cm, narrowly elliptic to ovate, attenuate or truncate at base, sparsely sericeous abaxially, the margins erose; flowers (3.4–)6–6 in each umbel; peduncles 0.2–2.5 mm long; limb of petals erose or crenulate–dentate; anthers pubescent; anterior style shorter than posterior styles, all 3 bearing folioids. *Grenada, Trinidad, Amazonas Columbia, Venezuela, Ecuador, Amazonas Peru and Brazil; 3 varieties, 1 in Venezuela. The second variety, var. macrosepalum C.E. Anderson, has a long samara wing similar to that of most other species of the genus. It is found in Ecuador and Peru.*

*S. adenoson var. adenoson* Samaras with nut 12–19 mm diameter including air chambers, the dorsal wing partially encircling nut, 30–44 mm long from base of nut. Wet areas along rivers, near sea level; Delta Amacuro (La Margarita–Puerto Miranda, Téima, Tucupita–La Horqueta). *Sucre, Granada, Trujillo, Amazonas Colombia, Peru, and Brazil.*


**Stigmaphyllum geoffroyi** Cov., Ann. Sci. Nat. Bot. ser. 2, 13: 299. 1850. Vine to 15 m; petals up to 100 mm long; blade of larger leaves 6–16 x 3–12 cm, ovate or cordate, ovate at base, abaxially very sparsely and minutely sericeous (apparently glabrous), the margin with sessile glands 0.2–0.5 mm diameter and filiform glands up to 1.6 mm long; flowers 15–40 in each congested pseudosepalum; peduncles 4–12.5 mm long; limb of petals erose to dentate–fimbriate; anthers glabrous; anterior style shorter than posterior styles, all 3 bearing folioids; "samaras" with nut bearing short winglets, crests, or spurs on sides and dorsal
wing 34-42 x 12-20 mm, widest distally. Moist forests, along rivers, secondary growth, roadsides, near sea level to 300 m; expected in Delta Amacuro adjacent to Guaiana, Guyana, Suriname, French Guiana, northeastern Brazil.

Woody vine; petioles up to 72 mm long, blade of larger leaves 9-18-20 x 4.5-12.5 cm, elliptic to ovate, attenuate or truncate or sometimes cordate at base, ± densely sericeous abaxially, the margin with sessile glands 0.3-0.4 mm diameter; flowers 6-15 in each umbel; peduncles 6-15.5-8.8 mm long; limb of petals digitate-fimbriate, the fimbriation up to 0.6-0.8 mm long, anthers glabrous or pubescent; anterior style longer than posterior style, all 3 bearing foliaceous, samaras with nut smooth-sided or with 1-5 prominent rib and dorsal wing 25-41 x 9-15 mm, widest at base. Evergreen lowland forests, gallery forests, river banks, mangrove swamps, near sea level to 100 m; Delta Amacuro (La Margarita—Puerto Miranda, Mision del Guayu, Rio Amacuro, Rio Guayubini), Monagas; Central America, West Indies, Colombia, Guaiana, Suriname, French Guiana, Amazonian Peru, Brazil.

—Banisteria australis DC., Prod. 1: 588. 1824.
Woody vine; petioles up to 150 mm long, leaf blades 5-21 x 4.5-20 cm, triangular or ovate to orbiculate, acute to deeply auriculate at base, abaxially sparingly to very densely sericeous, the margin with sessile glands 0.4-1.5 mm diameter and sometimes with foliaceous glands up to 3.5 mm long; flowers 15-30-40 in each congested pseudoracemose; peduncles 2.5-11 mm long; limb of petals cuneate; anthers glabrous; anterior style longer than posterior style, all 3 bearing foliaceous, samaras with nut usually bearing short winglets, crests, or spurs on sides and dorsal wing 35-55 x 10-18 mm, widest dis tally. Primary and secondary forests, especially wet forests, but also in vegetation on white sand, along rivers, at Roadsides, and in thickets, 50-900 m; Delta Amacuro (Rio Grande, Sierra Imataca), widespread in low-lands of Bolivar and Amazonas. Present in most states of northern Venezuela; Colombia, Guaiana, Suriname, French Guiana, Ecuador, northern Peru, northern Brazil, Amazonian Bolivia. *Fig. 110.*

Stigmaphyllum australianum is common throughout much of Amazonia and excessively polymorphic. For a thorough discussion of its variability and comparison to similar species, see C. Anderson, Costr. Unv. Michigan Herb. 19: 385-413. 1993.

23. **TETRAPTERYS** Cav., Dész. 9: 433. 1790, nom. cons.

Woody vines or shrubs, occasionally described as small trees. Leaves usually bearing glands; stipules small, interpetiolar or epipetiolar, or absent. Flowers borne in umbels, corymes, or pseudoracemes, these often grouped in panicles. Calyx usually bearing 8 or 10 glands, eglandular in a few species; petals yellow or pink. Stamens 10, all fertile; anthers ± alike. Ovary with the 3 carpels centrally connate, an all fertile; styles 5, the apex with an internal to terminal stigma and dorsally smooth, truncate, or short-hooked. Fruits breaking apart into 3 samaras, each samara having its largest wings laterial, usually 4 discrete wings; dorsal wing smaller, sometimes reduced to a crest or lost; intermediate winglets or projections sometimes present; all wings reduced to rudimentary outgrowths in a few species.

Mexico, Central America, West Indies, South America (all countries except Chile and Uruguay); at least 70 species, ca. 18 in Venezuela, 11 of these in the flora area. The taxonomy of this genus is far from satisfactory; as it is studied and better resolved in coming years the number of species recognized will probably increase substantially.

**Key to the Species of Tetrapterys**

1. Inflorescence simple or compound, terminating in umbels of 4-6 flowers; bracteoles smaller than filiform bracts or the same size, eglandular or abaxially collose;
1. Inflorescence an axillary or terminal pseudoeome, usually unbranched, rarely basally ternate, the flowers sometimes reduced to 1 pair or crowded distally to form a few-flowered corymbs or umbels; bracts mostly larger than floreosae bracts (wider and often at least as long), often bearing marginal or abaxial glands

20(1). Stipules distinct; styles slender, with small, discrete, nearly terminal stigmas; needlefoes bracts of the inflorescence inconspicuous, 5 mm long or less, lanceolate; bracteoles longer than wide; calyx glands (if present) becoming stalked in older flowers and fruits T. mucronata

2. Stipules connate in interpetiolar pairs, often caducous but then leaving a prominent interpetiolar scar; styles stout, stigmatic on internal angle of apex with the stigmas decurrent; inflorescence containing concolorous, often orbicular, foliaceous bracts 4-20 mm long, much smaller and thinner than vegetative leaves but much larger than floreosae bracts, the large bracts deciduous and usually absent from fruiting specimens; bracteoles about as wide as long or wider; calyx glands sessile

32(9). Samaras with winglets or acute outgrowths between dorsal and lateral wings, the upper lateral wings 12-22(25) mm long, the lower 4-10 mm long; stipule pair 1-2 mm wide, the scar stretched to 2.5 mm at older nodes; leaf blades (7.5-15-14.5 x 3-4-6.5 cm); petioles 7-12 mm long

3. Samaras usually devoid of outgrowths between dorsal and lateral wings, the upper lateral wings 22-35 mm long, the lower 11-15-20 mm long; stipule pair 2.5-4 mm wide, the scar stretched to 5.5 mm at older nodes; leaf blades (11-15-20 x 5-8-10.5 cm); petioles (12-14-20-27) mm long

41(7). Calyx bearing 8 glands, i.e., lateral 4 sepals biglandular, anterior eglanular; petals abaxially ± abundantly appressed-tomentose or subtomentose...

4. Calyx bearing 10 glands, i.e., all 5 sepals biglandular; petals glabrous or bearing a few appressed hairs abaxially

54(5). Limb of lateral petals denticulate or entire; filaments densely to sparsely papillose; glands on leaf blade marginal or none; none of samara usually bearing acute outgrowths between dorsal and lateral wings

5. Limb of lateral petals fimbriate; filaments glabrous; glands present on abaxial surface of leaf blade in most species, between midrib and margin; out of samara usually devoid of outgrowths between dorsal and lateral wings (all wings reduced to thick, irregular outgrowths in T. olearius)

65(6). Blade of larger leaves up to 6 cm long, persistently appressed-tomentose abaxially or eventually glabrescent, the hairs a serpentine and coarse

6. Blade of larger leaves 3.5-15 cm long, persistent or emerge abaxially, the hairs (if any) straight and appressed

76(7). Woody vine or robust shrub or small tree 2-3 m tall, usually growing by rivers; leaf blades (2.5-10.5-17 cm wide; calyx glands (2.5-3.5 mm long); lateral wings of samara (7-9-14 mm long; 4 subequall; anchors (1.3-1.5-1.8 mm long; bracteoles 2-5 mm long T. styloptera

7. Wiry-stemmed shrub 0.2-0.8(-1.5) m tall, in savannas; leaf blades 0.7-2.8 cm wide; calyx glands 1.5-2 mm long; lateral wings of samara 1-3(-5) mm long, variable in number, irregular and often unequal; anthers 0.9-1.1-1.5 mm long; bracteoles up to 2 mm long T. gracilis

85(9). Stems, inflorescence, and leaves very soon nearly or quite glabrate, except for golden-sericeous axillary buds; leaf blades with margins sometimes revolute but usually not or only slightly thickened, the veins visible on one or both sides; shrubs or vines

86(8). Leaf blades abaxially thinly sericeous to glabrate, the epidermis and glands easily seen

9. Leaf blades abaxially densely and persistently sericeous, the hairs nearly or completely concealing the epidermis and often hiding the glands, if any

109(10). Leaf blades 2.5-5.1 cm wide, with a row of 9-20 abaxial glands between midrib and margin; lateral wings of samara normal, i.e., all 4 well developed, subequal, thin...

10. Leaf blades up to 2.4 cm wide, eglanular or with 2-4 abaxial glands near base; lateral wings of samara reduced to rounded crests or thick and acute irregular outgrowths T. olearius


Woody vine (7) or shrub or treelite 1-3.5 m tall; petals 2-4 mm long; blade of larger leaves 2.5-6 x 1.3-3 cm, abaxially persistently appressed-tomentose to subamplexicaul, the margins sericeous or rarely ciliulate; glands on leaf blade marginal or none; none of samara usually bearing acute outgrowths between dorsal and lateral wings人家


Woody vine (7) or shrub or treelite 1-3.5 m tall; petals 2-4 mm long; blade of larger leaves 2.5-6 x 1.3-3 cm, abaxially persistently appressed-tomentose to subamplexicaul, the margins sericeous or rarely ciliulate; glands on leaf blade marginal or none; none of samara usually bearing acute outgrowths between dorsal and lateral wings


Woody vine; stipules connate in interpetiolar pairs, leaving a scar 2.5-5.5 mm wide; petals (12-14-20-27) mm long; blade of larger leaves (11-15-20 x 5-6-10.5 cm); petioles 7-12 mm long; blade of larger leaves (7.5-9-14 x 3-4-6.5 cm), soon glabrate

Tetrapteryx discolor (G. Mey) DC., Prodr. 1: 587. 1824.

Woody vine; stipules connate in interpetiolar pairs, leaving a scar 1.5-2.5 mm wide; petals 7-12 mm long; blade of larger leaves (7.5-9-14 x 3-4-6.5 cm), soon glabrate


Woody vine; stipules connate in interpetiolar pairs, leaving a scar 2.5-5.5 mm wide; petals (12-14-20-27) mm long; blade of larger leaves (11-15-20 x 5-6-10.5 cm); petioles 7-12 mm long; blade of larger leaves (7.5-9-14 x 3-4-6.5 cm), soon glabrate
with a row of tiny axillary glands between midrib and margin; flowers borne ultimately in umbels of 4; 4 lateral sepals bidentate, anterior one digitate; petals yellow, glabrous, entire; stamens 4, filaments internal, dilated; upper lateral petals of samara 12–22–25 mm long, lower pair 4–10 mm long, several narrow winglets or rounded or acutate outgrowths present between dorsal and lateral wings. Along rivers, in forest, at shrubby roadside, 50–700 m. Delta Amazonas (east-north-east of EL Palmar, southeast of Picuco, Rio Amazonas, upstream from San Victor), Bolivar (common north of 6°N, Rio Karra), Aroetapae, Apure, Falcón, Lara, Monagas, Sucre, Táchira, Mérida, Central America, West Indies, Colombia, Guyana, Suriname, French Guiana, Amazonian Rondon, Peru, Brazil, and Bolivia.


Woody vine, sometimes a shrub 1.25–2 m tall; stems a persistent spiculum; petals (3–)5–15 mm long; blades of larger leaves 4–(11–)15 × (1.5–)2.3–6–6 cm, axially thinly sericeous to glabrate, with a row of 6–30 axillary glands on each side between midrib and margin, inflorescence an axillary pseudocyme of 4–16 flowers; bracteoles larger; petals all glandular; petals yellow, tinged with red, glabrous, filibractiate; filaments glabrous; stamens 4, filaments internal, dilated; ovary 3–5 mm long, lacking outgrowths between dorsal and lateral wings. Along streams, edge of moist forests, occasionally in savannas; 50–3000 m; widespread in southern Bolivar and Amazonas. Guyana, Suriname, French Guiana, Brazil (Amazonas: Serra Ariau, Roraima), Peru (Huánuco). [Fig. 112.]

_Tetrapetra_ hauchacamacensis was based on shrubby plants from Cerro Duida and Cerro Huañacamacu with leaves that are smaller than usual for the species. The additional collections of this complex that have accumulated over the last 20 years reveal that there is no long-term tendency for _T. frimbripetala_ to be shrubby in various parts of its range, especially at higher elevations, and plants with small leaves also occur at scuttered localities, in both shrubby and climbing plants. It therefore seems best to treat this variation as a single variable species.


Wiry-stemmed shrub 0.5–0.6–1.5 m tall; petals 3.5–4–9 mm long; blade of larger leaves 3.5–6.5–10 × 0.7–2.8 cm, soon glabrate, eglandular except for small im pressed marginal glands; inflorescence an axillary pseudocyme of 4–12–20 flowers; bracteoles larger than bracts, often bearing axillary glands; petals all glandular; petals yellow, glabrous or bearing a few axilary hairs, entire or dentate; filaments sericeous to subglabrous; samaras with lateral wings 1–3–6 mm long, variable in number, irregularly divided often unequal. Sandy swamp, 100–200 m; Bolivar? (see discussion below), Amazonas (Rio Cuso to Rio Patamona). Colombia (Vaupés).

_Tetrapetra_ gracilis was described to accommodate plants that are obviously closely related to _T. stylopous_ but differ from it in their habitat, habitat, size of various parts, and reduced, irregular samaras. Most plants have very narrow leaves and low stature and look quite different from the riparian vines of _T. stylopous_, but occasional plants have higher stature and wider leaves and then resemble _T. stylopous_ more strongly. One very anomalous plant in Siergos et al. 6286 from the piedmont rain forest on the Rio Cuyuni in northeastern Bolivar, far from all populations of _T. gracilis_ and in the wrong habitat. It was a shrub with leaves that are large for _T. gracilis_ and toward the small end of the range for _T. stylopous_. No fruit or seed material for _T. gracilis_ desrvizes recognition, it may be that we should consider Siergos et al. 6286 to be that species, but it may also be that it represents a population of _T. styl_ opos in which the fruit have become reduced independently of and in parallel to the same tendency in _T. gracilis_.


Woody vine or shrub 1–2 m tall; stems often 3–5 mm long; blade of larger leaves 4–8–5 × 1.5–3.5 cm, abaxially loosely sericeous to glabrate, with 1–5 glands in a row between midrib and margin; in terminal or near terminal petals of samara 8–30 flowers; bracteoles wider than bracts but often not as long, one of each pair bearing 1 large exo centrictic abaxial gland; 4 lateral sepals bidentate bidentate, anterior one digitate; petals yellow, axially abundantly appressed-tomentose or suberose-corsose, crosa; filaments glabrous; samaras with lateral wings 9–14 mm long, bearing irregular outgrowths between dorsal and lateral wings. Evergreen lowland and lower montane forests and thickets, 50–2000 m; Bolivar (south of Altoplanicic de Nuntas and southeast of Carangas) (CVG-Las Flores, El Dorado), Guayana, Amazonian Brazil and Bolivia.

_Tetrapetra_ mucronatus Cav., Dios. 9: 434, pl. 262. 1790.


Woody vine, rarely described as a shrub or small tree; stipules minute, distinct; petals 5–15–20 mm long; blade of larger leaves (4–)6–16–17) × (3.5–)4–6–10.5 cm, abaxially and axially thinly sericeous to glabrate, with 2 glands at base and usually a distal pair between midrib and margin; flowers borne in small umbels of 4–6; bracteoles narrowly triangular, smaller than bracts; petals all glandular or the lateral 4 bidentate, glands becoming stalked in age; petals yellow, often with reddish flecks, glabrous, entire; stamens 4, filaments internal or nearly terminal; lateral wings of samara 5–22 mm long, the upper pair ca. twice as long as the lower; acutate outgrowths usually present between dorsal and lateral wings. Evergreen lowland forests, along streams, in roadside shrubs, 50–400 m; common in Bolivar and Amazonas Apure, Costa Rica, Colombia, Guyana, Suriname, French Guiana, Ecuador, Peru, Brazil (from Minas Gerais north), Bolivia.

_Tetrapetra_ mucronatus is an exceedingly variable species, especially in the size and shape of its leaves, but it hangs together as a monophyletic taxon. Whether that should be considered one variable species or a complex of closely related taxa is still a future monograph to decide.

_Tetrapetra_ oleifolia (Benth.) Griseb. in Mart., Fl. Bras. 1213: 86. 1858. —_Hiruca_ oleifolia (Benth.) Griseb., Linnæas 22: 19. 1849. Shrub 0.5–1 m tall; stems densely and persistently golden-setose (tubes 0.13 mm long; blade of larger leaves 5.5–10 × 0.8–2.4 cm, axially densely and persistently sericeous to broadly glabrate, eglandular or with 1/3 pairs of ingrown glands (often hidden under hairs) near base; inflorescence an axillary pseudocyme of 5–6 flowers; bracteoles larger than bracts; sepals all glandular; petals yellow, tinged with red, glabrous or bearing red, glabrous; filaments glabrous; mericarp bearing a dorsal crest up to 3 mm wide and several short, rounded or acutate lateral outgrowths. Upland areas along streams or in sandy savannas, 1000–1400 m; Bolivar (Cerro La Dona, northwest of Cerro Norte, Gran Sabana, Rio Apayna, southwest of Roraima-tupai). Western Guyana. [Fig. 131.]

As I noted in 1981, the fruit of _Tetrapetra_ oleifolia, which apparently has only rudimentary wings, is known only from Steynook et al. 105495 (NY), in which the fruits are immature. No other fruiting collections have come to my attention in the last 19 years.

_Tetrapetra_ purullia Steyerm., Fieldiana, Bot. 28: 294. 1962. "Virgate subshrubs or shrubs 0.2–0.3 m tall; vegetative parts glabrous except for golden-setose axillary buds; petals 1.5–3–5 mm long; blade of larger leaves 2.5–5–7 × 1–3 mm, with several abaxial glands between midrib and thickened margin; inflorescence an axil lar pseudocyme, bracteoles larger than —


Wiry-stemmed shrub 0.3-0.9 (-1.5) m tall; stems 4-6(-9) mm long; blade of larger leaves 3.5-6.(-10) x 0.7-2.8 cm, soon glabrate, glandular except for small impressed marginal glands; inflorescence an axillary pseudocyme of 4-12(-20) flowers; bracteoles larger than bracts, often bearing abaxial glands; sepals all glandular; petals yellow, glabrate or bearing a few abaxial hairs, entire or denticulate; filaments seri-...
bracts, bearing small axillary glands; sepals 6 all glandular; petals yellow, glabrous, filiform, filaments glabrous; style with stigma interna to apparently terminal; samaras with lateral wings 5-7 mm long, subequal, lacking outgrowths between lateral wings and dorsal crest. Sandy upland savannas and tepui meadows, rocky slopes, 500-1400(-2000) m; Bolivar (common in the Gran Sabana, Ito-tepui). Western Guyana. •Fig. 111.

_Tetrapetra rhodoptera_ Oliv., Timbiri 5: 190. 1856.


Woody vine, sometimes a shrub 0.5-2.5 m tall, stems persistently sericeous; petals 6-12 mm long; blade of larger leaves 6-10.5 x 2.5-5.1 cm, abaxially densely and persistently sericeous, with a row of 9-20 glands on each side between midrib and margin; inflorescences axillary or terminal pseudosecremy of 4-16 flowers; bracteoles larger than bracts; sepals all glandular; petals yellow, sometimes tinged with red, glabrous, filiform; filaments glabrous; samaras with lateral wings 8-17 mm long, lacking outgrowths between dorsal and lateral wings or rarely with 1 subulate outgrowth. Near streams, apparently often in open rocky or sandy places but also reported from gallery forests, 400-1700 m; Bolivar (common in the Gran Sabana from Auyán-tepui east and south). Western Guyana.

_Tetrapetra rhodoptera_ is essentially identical to _T. fimbripetala_ except for the fact that the leaf blades are densely and persistently sericeous abaxially in _T. rhodoptera_, thinly sericeous to glabrate in _T. fimbripetala_. Distinguishing between the two taxa is generally easy, but it may be that _T. rhodoptera_ simply represents the extreme of a cline of variation and does not merit recognition. In two Bolivar collections that I am calling _T. rhodoptera_, Holst & Linder 2419 (MCH, MO) from Rio Soray and Linder & Holst 1982 (MICH, MO) from near El Parají, the hairs are of intermediate density and the distinction is somewhat arbitrary.


Woody vine, rarely described as shrub or tree 2-3 m tall, petals 3-14 x 9-11 mm long, blade of larger leaves 4.3-7.5 x 2.5-3.5-7 cm, abaxially thinly sericeous to glabrate, eglundulifer except for small im pressed marginal glands; inflorescences axillary or terminal pseudosecremy of 4-24 or more flowers; bracteoles larger than bracts, often bearing 1 or 2 abaxial glands; sepals all glandular; petals yellow, glabrous or abaxially very sparsely sericeous, denticulate; filaments usually sericeous; samaras with 4 subequal lateral wings 7-18 x 15 mm long, bearing several slender outgrowths between dorsal and lateral wings. Along rivers, often at edge of gallery forests, occasionally in open savannas, near sea level to 1200 m; common throughout much of Bolivar and Amazonas. Carrao, Dist. Federal, Pal- cole, Lara, Mérida, Miranda, Táchira, Trujil- lla, Venecia, Zulia; Nicaragua, Panama, Colombia, Guyana, Suriname, French Guiana, Amazonian Peru, Brazil, and Bolivia. •Fig. 114.

See discussion of Steward et al. 6266 under _Tetrapetra gracilis._

Fig. 112. _Tetrapetra fimbripetala_

Fig. 113. _Tetrapetra oblongifolia_

Fig. 114. _Tetrapetra styloptera_