

ASTERACEAE

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A cosmopolitan family with ~1,700 genera and 25,000 species (Mandel et al. 2019) of herbs, shrubs, trees, vines, and lianas. In the Neotropics, Asteraceae is the family with the second largest number of climbing plant species, represented by 90 genera and ~902 species. These occur in a wide range of habitats, including moist, wet or dry forests, scrublands, savannas, deserts, and open disturbed biomes; 0–4,500 m.

Diagnosics: Recognized by the capitulate inflorescences, flowers with inferior ovary and fruits with highly modified calyx into pappus. Although Asteraceae is morphologically very variable, the stem in many species have a relatively large medulla made of thin-walled cells that have the appearance of polystyrene foam. Leaves are commonly serrate or dentate and less often entire; exudates for the most part are clear and watery or resinous in species of *Mikania* and *Perymeniopsis*.

General Characters

1. STEMS. Woody or herbaceous depending on the genus. Woody, mature stems commonly are soft and pliable, and can reach up to 10 cm in diam. and as many as 20 m in length (e.g., *Mikania*, *Otopappus*, *Tilesia*). They are generally terete, although several species have square or winged stems when young. Most genera have a large medulla with thin-walled cells (Figures 44D, F; 45A–C, E, F), regular wood anatomy with narrow rays (Figures 44A; 45A–C, E, F) and wide vessels (visible by naked eye). Some genera have shallow to deep phloem wedges (Figure 44D–F) and some species of *Mikania* have wide rays dissecting the axial vascular tissue into radial segments (Figure 44C). Barks are commonly beige, smooth, and slightly fissured. In *Mikania* (Figure 46B) and *Piptocarpha*

(Figure 46D) they are commonly lenticellate, while in *Berylsimpsonia* they can be corky or peeling off in plates (Figure 46C).

2. EXUDATES. For the most part are watery and colorless, however, in *Mikania* and *Perymeniopsis* exudate can be resinous (Figures 44B; 45D), in *Munnozia* and *Sinclairia* can be milky white.
3. CLIMBING MECHANISMS. Most climbing Asteraceae are scramblers that lean and climb over other plants, often producing short, lateral, plagiotropic branches, and sometimes aided by axillary spines (e.g., *Dasyphyllum*; Figure 47C, D); twiners (Figure 47A) although present in many species, are restricted to a small number of genera (e.g., *Archibaccharis*, *Cyathomone*, *Leonis*, *Mattfeldia*, *Mikania*, *Nesampelos*, *Oligactis*, *Pseudogynoxys*, some *Pentacalia* and *Salmea*); tendrils of foliar origin are found only in *Mutisia*; prehensile petioles are found in *Hidalgoa* (Figure 47B), and in some *Ericentrodea*; root-climbers are known in *Gongrostylus*, *Neomirandea*, *Tuberostylis*, some *Pentacalia* and *Sinclairia* (the latter two genera sometimes growing as epiphytic vines).

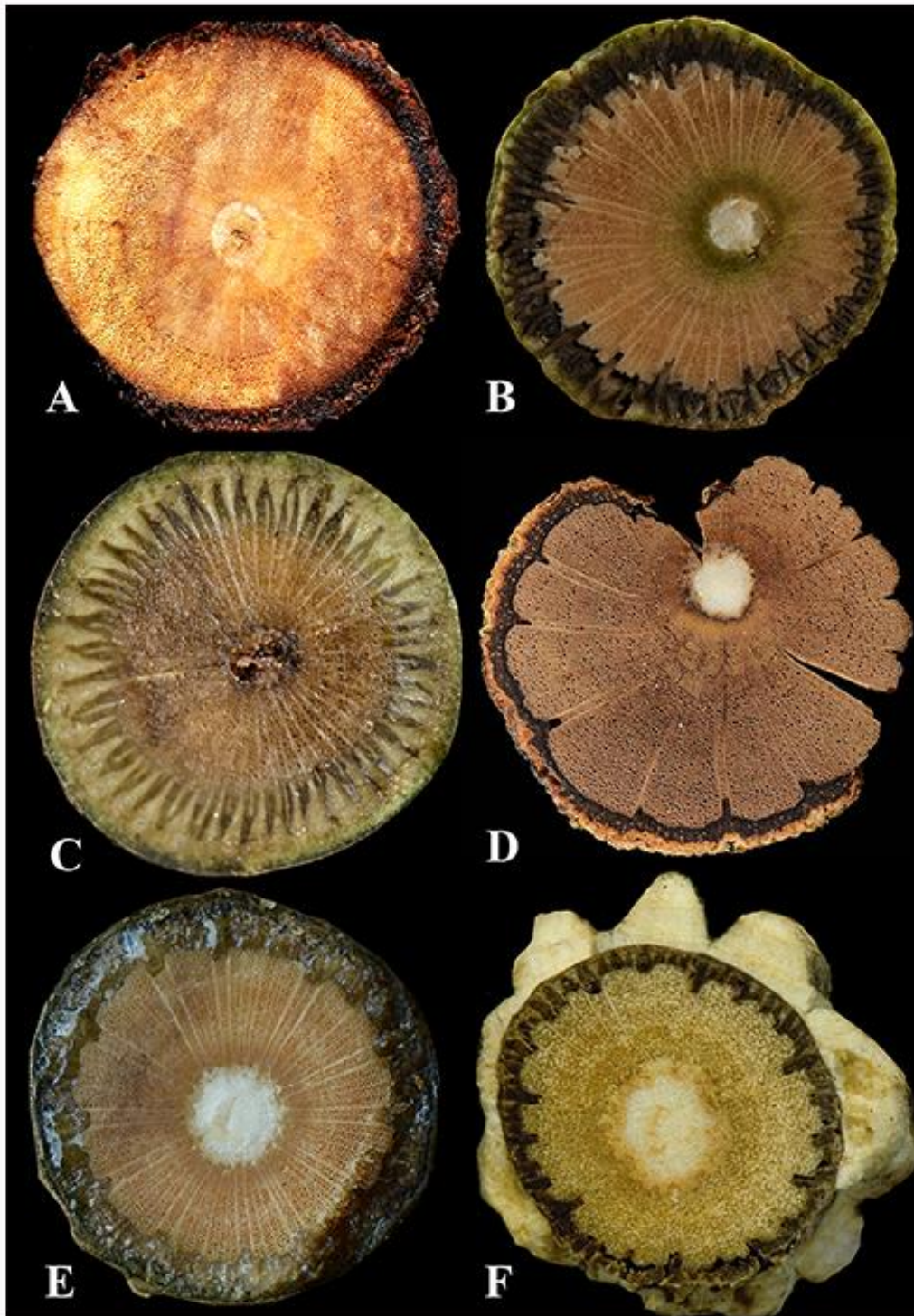


Figure 44. Cross sections of stems. **A.** *Piptocarpha lechleri* with regular wood anatomy. **B.** *Chromolaena odorata* with large medulla, wide rays, and phloem wedges. **C.** *Mikania* sp. with regular wood anatomy. **D.** *Otopappus scaber* with shallow phloem wedges. **E.** *Perymeniopsis ovalifolia* with shallow phloem wedges and resinous exudate. **F.** *Verbesina crocata* with shallow phloem wedges and corky bark. Photos by P. Acevedo.

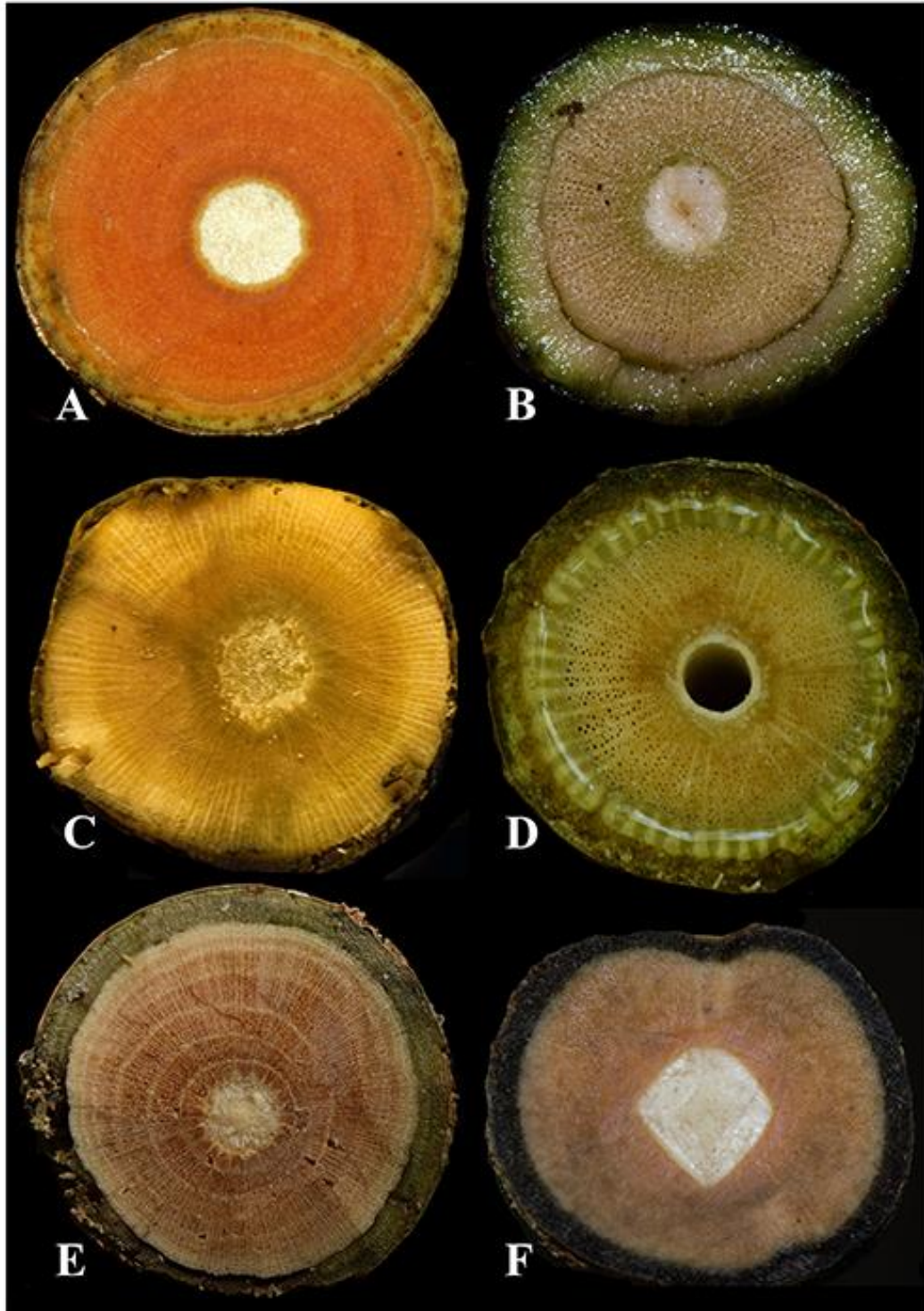


Figure 45. Cross sections of stems with regular wood anatomy. **A.** *Dasyphyllum varians* with large medulla. **B.** *Trixis antimenorrhoea*. **C.** *Pentacalia desiderabilis*. **D.** *Mikania glomerata* with hollow medulla. **E.** *Otopappus imbricatus*. **F.** *Piptocarpha quadrangularis* with large, square medulla. Photos by P. Acevedo.

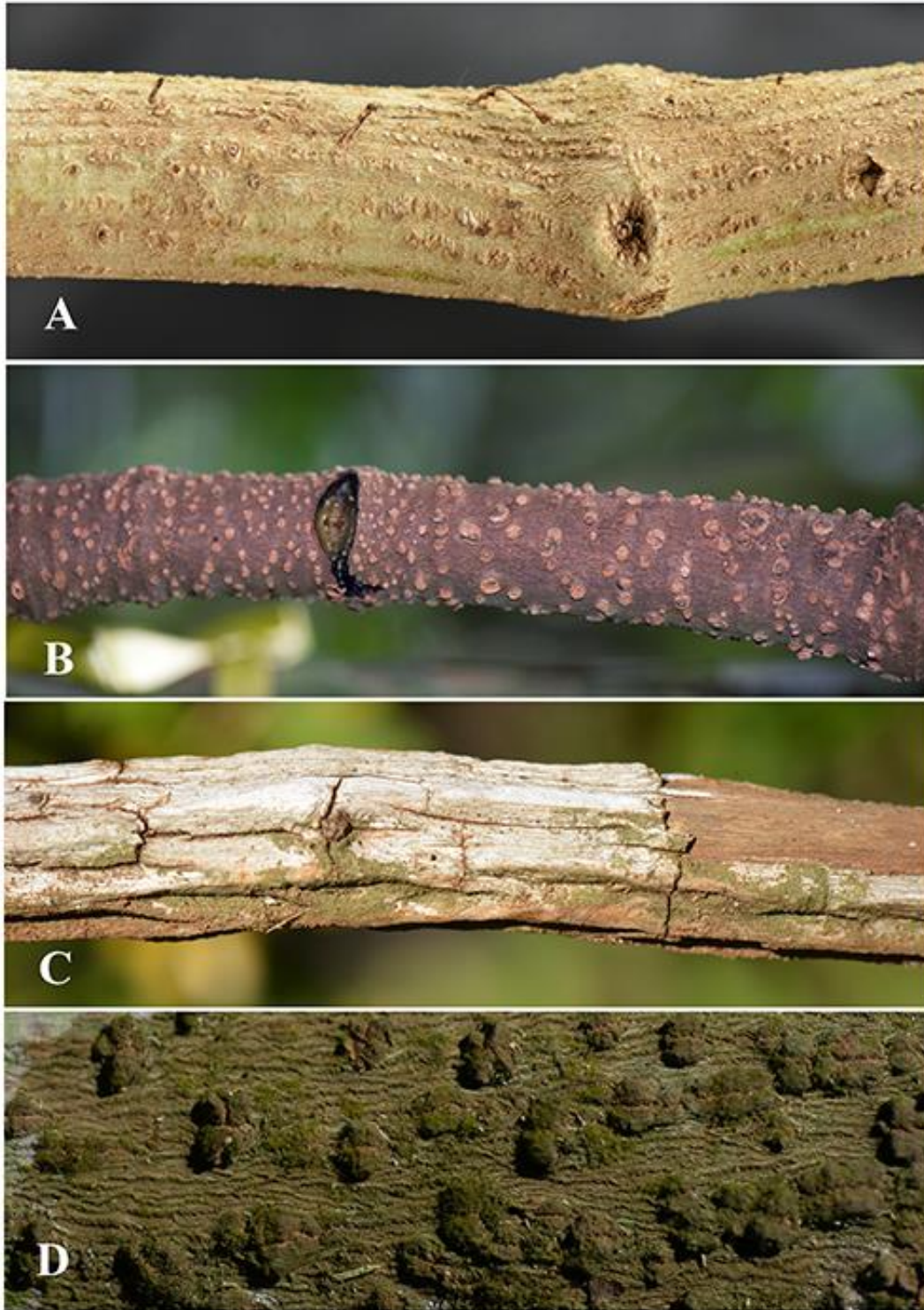


Figure 46. Barks in climbing Asteraceae. **A.** *Chromolaena odorata*, smooth with few lenticels. **B.** *Mikania* sp. densely lenticellate, stem with resinous exudate. **C.** *Berylsimpsonia crassinervis*, corky bark, peeling off in rectangular plates. **D.** *Piptocarpha lechleri*, rough and lenticellate. Photos by P. Acevedo.



Figure 47. Climbing mechanisms in Asteraceae. **A.** *Mikania* sp. a woody twiner (twisted stem in the middle). **B.** *Hidalgoa ternata* with prehensile petioles (upper right corner). **C.** *Dasyphyllum sprengeianum* a scrambler with paired “snake-fang” thorns. **D.** *Dasyphyllum varians*, a scrambler with paired, acicular, axillary thorns. Photos by P. Acevedo.

4. LEAVES. Alternate, opposite, simple, lobed, trifoliolate, palmately compound (Figure 48A) or further compound (Figure 48D); margins entire serrate, dentate or spinulose.

Petioles short to long, or sometimes absent. Stipules absent but several genera have pseudo stipules representing prophylls or interpetiolar tissue (e.g., *Liabum*, *Mikania*, *Munnozia*, and *Pseudogynoxys*).

5. **INFLORESCENCES.** Axillary or terminal capitula that are solitary or grouped into variously shaped synflorescences (Figure 49). Capitula 1- to many-flowered, homogamous (flowers with the same sexual disposition, usually bisexual and fertile), or heterogamous (flowers with different sexual dispositions, usually pistillate and bisexual).
6. **FLOWERS.** Sessile, bisexual, unisexual or neuter, on a common, naked, pilose or paleate receptacle, surrounded by an involucre of bracts. Calyx represented by a persistent or caducous pappus or a crown of scales, awns, setae or bristles; corolla tubular, actinomorphic (5-lobed) or zygomorphic (liguliform, bilabiate, or ligulate); stamens 5, epipetalous, commonly connivent around the style; ovary inferior, 2-carpellate, unilocular, with a single basal ovule, style filiform, style branches 2.
7. **FRUITS.** A cypsela, often crowned by a pappus of scales, awns or bristles (Figure 50A, D).

USES

Although Asteraceae is the largest plant family worldwide, the number of species that have useful applications such as food, beverages, spices, sweeteners, insecticides, medicines, ornamentals, rubber, resins, and dyes are relatively low (Simpson 2009). Within the climbing plants, species of *Mikania*, commonly referred to as “guaco”, are among the best-selling natural products in the world. According to Rufatto et al. (2012) only 12% of *Mikania* species have been studied for their chemical and pharmacological properties, accounting for 55 species that provide over 300 different chemical compounds, such as terpenes and derivatives, alkaloids, saponins, sterols and flavonoids. In addition, several genera contain species that are known for their ethno pharmacological activity. These include *Chromolaena odorata* (L. f.) R.M. King & H. Rob., that contains flavonoids, essential oils, phenols, tannins and saponins (Omokhua et al. 2016); four species of *Calea* (i.e., *C. jamaicensis* (L.) L., *C. pinnatifida* (R. Br.) Less., *C. prunifolia* Kunth and *C. serrata* Less.) respectively with cytotoxic, antitumor, vasodilatory, and acaricidal properties (Grafakou et al. 2021, Caldas et al. 2019, Puebla et al. 2011, Ribeiro et al. 2011). Similarly, the following are known for various properties, *Critonia morifolia* (Mill.) R.M. King & H. Rob. for antitumor activity, *Cyrtocymura scorpioides* (Lam.) H. Rob. for antimicrobial activity, *Dasyphyllum brasiliense* (Spreng.) Cabrera for anti-inflammatory, *Pentacalia desiderabilis* (Vell.) Cuatrec. for antitumor, trypanocidal and antifungal activity, *Piptocoma rufescens* Cass. for cytotoxic activity, and *Salmea scandens* (L.) DC. for antifungal and anti-mosquito (*Aedes aegypti*) properties (Unger et al. 2012, Pinto et al. 2016, Castelucci et al. 2007, Morais et al. 2012, Ren et al. 2018, Villa-Ruano et al. 2015).

Several genera are commonly cultivated as ornamentals because of their beautiful inflorescences and foliage; these include *Mikania ternata* (Vell.) B.L. Rob., *Verbesina fraseri* Hemsl. widely cultivated in Mexican gardens, *Pseudogynoxys chenopodioides* (Kunth) Cabrera and the African *Senecio tamoides* DC. and *S. mikanioides* Otto ex Walp. which are cultivated throughout the tropics and subtropics. Several species of *Barnadesia*, *Mutisia* and *Stiffia* produce very attractive, large capitula with colorful corollas and pappus, and although seldom planted, they are good candidates as ornamental plants.

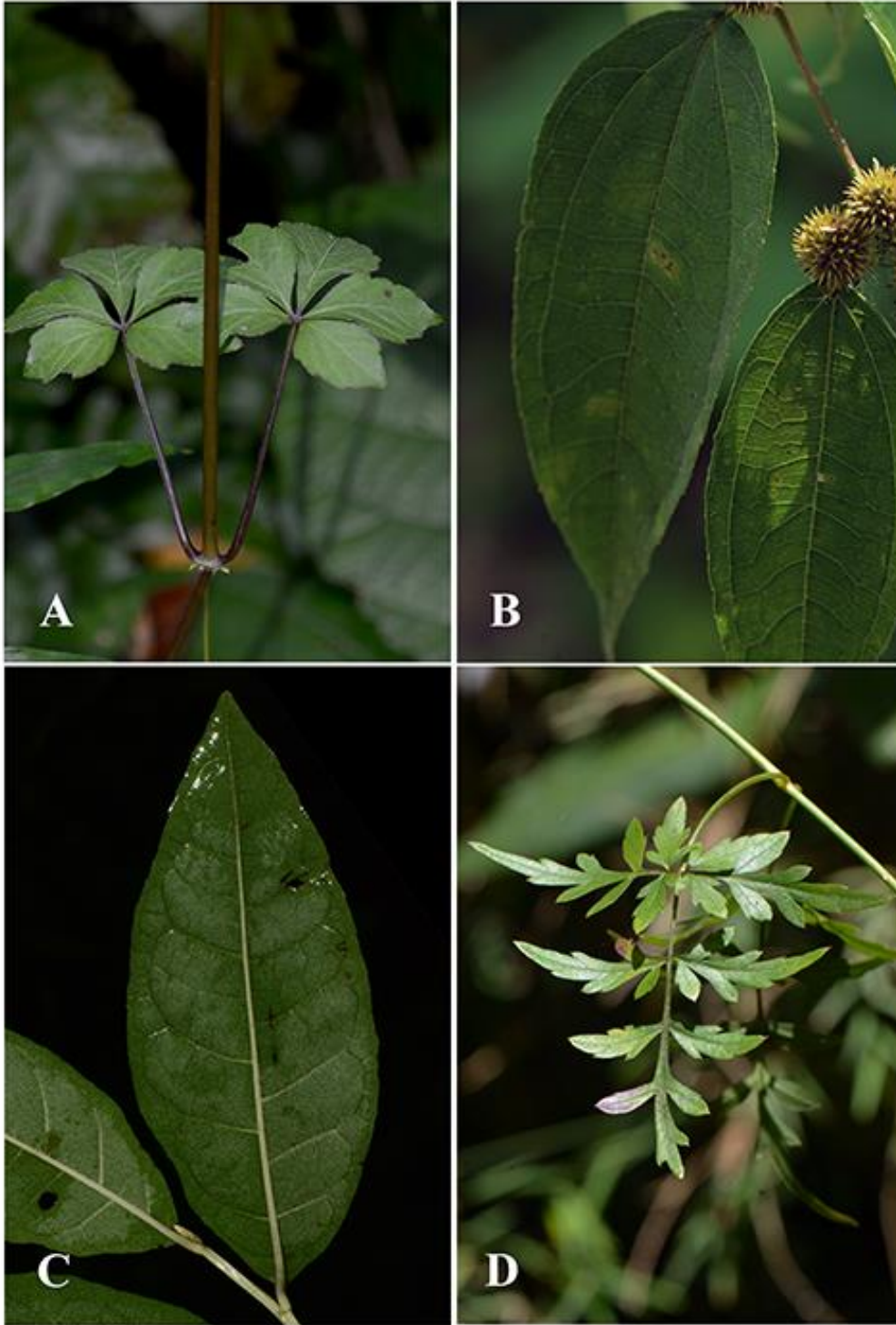


Figure 48. Leaves in Asteraceae. **A.** *Hidalgoa ternata*, opposite, 5-palmately compound. **B.** *Otopappus mexicanus*, opposite, simple, triplinerved. **C.** *Piptocarpha* cf. *notata*, alternate, simple, pinnate venation. **D.** *Bidens urbanii*, opposite, 2–3-pinnatisect. Photos by P. Acevedo.

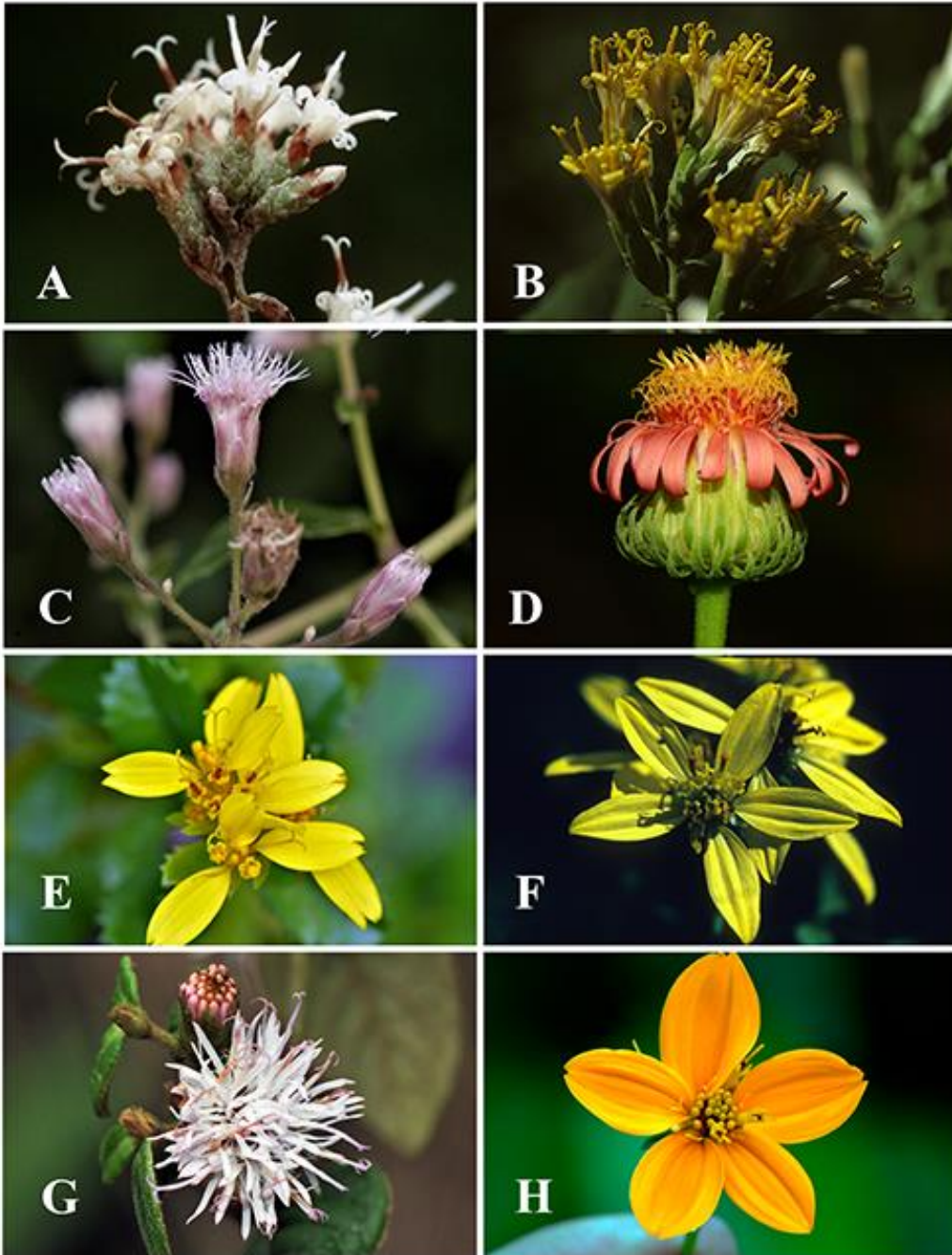


Figure 49. Capitula in climbing Asteraceae. **A.** *Piptocarpha tetrantha*, homogamous, discoid capitula with 5-lobed corollas. **B.** *Berylsimpsonia vanillosma*, homogamous, discoid capitula with bilabiate corollas. **C.** *Heterocondylus vitalbae*, homogamous, discoid capitula with 5-lobed corollas. **D.** *Pseudogynoxys* sp., heterogamous capitula with ray and disc flowers. **E.** *Narvalina domingensis*, heterogamous capitula with ray and disc flowers. **F.** *Pentacalia epiphytica*, heterogamous capitula with ray and disc flowers. **G.** *Lepidaploa borinquensis*, homogamous capitula with deeply 5-lobed corollas. **H.** *Hidalgoa ternata*, heterogamous capitula with ray and disc flowers. Photos by P. Acevedo.



Figure 50. Cypselae in climbing Asteraceae. **A.** *Bidens reptans*, cypselae with 2 retrorsely barbed awns. **B.** *Tilesia baccata*, fleshy cypselae lacking pappus. **C.** *Dasyphyllum varians*, cypselae with plumose pappus, receptacle paleate. **D.** *Chromolaena odorata*, cypselae with scabrid, uniseriate pappus. Photos by P. Acevedo.

Key to the genera of climbing Asteraceae

1. Vine, root-climbing or epiphytic2
1. Plants scrambling, twining, tendrilled or with prehensile petioles.....5
2. Leaves alternate; capitulum calyculate; involucre bracts uniseriate*Pentacalia*
2. Leaves opposite or whorled; capitulum ecalyculate; involucre bracts 2–several series3
3. Vines epiphytic, with white latex; blades triplinerved, whitish beneath..... *Sinclairia*
3. Vines root-climbers, without latex; blades pinnately nerved, not white beneath4
4. Shrubs; blades elliptic, apex acuminate, margins entire; corolla lilac-pinkish; pappus of
bristles *Neomirandea*

4. Herbs; blades obovate, apex rounded, margins crenulate; corolla greenish white; pappus absent	<i>Tuberostylis</i>
5. Plants with prehensile petioles or foliar tendrils	6
5. Plants scrambling or twining	8
6. Leaves with distal tendrils	<i>Mutisia</i>
6. Leaves with prehensile petioles	7
7. Capitula radiate; ray corollas orange or red; pappus absent	<i>Hidalgoa</i>
7. Capitula discoid or radiate (in <i>E. corazonensis</i>); ray (when present) and disc corollas yellow; pappus 6–15 awns, retrorsely barbed	<i>Ericentrodea</i>
8. Leaves alternate	9
8. Leaves opposite	39
9. Presence of axillary spines or a spiny projection basal to the leaves; leaves often spinulose at margins and apex	10
9. Absence of axillary spines or thorns; leaves not spinulose at margins and apex	11
10. Leaves distichous, penninerved, born on a thickened spiny projection of the stem; capitula with 3–6 flowers; pappus of barbellate bristles	<i>Berylsimpsonia</i>
10. Leaves fasciculate or whorled, venation acrodromous basal or suprabasal, accompanied by long, axillary spines; capitula with 6–90 flowers; pappus of plumose bristles	<i>Dasyphyllum</i>
11. Stems, blades and/or involucral bracts with stellate (stalked, pseudo-stellate trichomes) or floccose pubescence	12
11. Stems, blades and/or involucral bracts glabrous or with distinct tector trichomes	15
12. Pubescence whitish or beige floccose	<i>Elekmania</i>
12. Pubescence stellate or pseudo-stellate	13

13. Capitula radiate or disciform, heterogamous; corollas reddish or yellow; pappus biseriate isomorphic *Dresslerothamnus*
13. Capitula discoid, homogamous; corollas pale violet, cream or whitish; pappus biseriate, heteromorphic14
14. Blades coriaceous; capitula axillary; most involucre bracts caducous; pappus persistent *Piptocarpha*
14. Blades usually chartaceous; capitula terminal; most involucre bracts persistent; inner series of pappus caducous *Piptocoma*
15. Blades margins narrowly recurved, adaxial surface bullate; *capitula* clustered and sessile in glomerule *Cuatrecasanthus*
15. Blades margins plane, adaxial surface smooth; capitula not in clusters16
16. Leaves sessile, petiole winged (base decurrent onto the petiole) *Achyrocline*
16. Leaves petiolate or sessile, but petiole not winged17
17. Capitula with 5 involucre bracts and 5 flowers *Paracalia*
17. Capitula with differing numbers of involucre bracts and flowers18
18. Plants dioecious or gynodioecious19
18. Plants monoecious21
19. Capitula radiate; ray flowers with corolla bilabiate and sterile, corollas mostly orange to orange red *Lycoseris*
19. Capitula disciform; marginal flowers with corolla tubular-liguliform, pistillate, mostly cream or whitish20
20. Female capitula with bisexual (but sterile) flowers in the center; cypselae compressed, 2–5-ribbed *Archibaccharis*

20. Female capitula wholly of pistillate flowers; cypselae terete, 5–20-ribbed	<i>Baccharis</i>
21. Blades pinnately veined (rarely palmatinerved)	22
21. Blades 3–5-plinerved	37
22. Capitula calyculate; involucre bracts uniseriate	23
22. Capitula ecalyculate; involucre bracts 2–several series	28
23. Style branches truncate to obtuse with trichomes of similar length.....	24
23. Style branches long-triangular or truncate and penicillate	26
24. Anther bases obtuse to auriculate (non-native species).....	<i>Senecio</i>
24. Anther bases sagittate to caudate	25
25. Style branches obtuse; flowers usually orangish	<i>Odontocline</i>
25. Style branches truncate; flowers usually whitish to yellowish	<i>Pentacalia</i>
26. Style branches long-triangular; flowers orange to reddish.....	<i>Pseudogynoxys</i>
26. Style branches truncate and penicillate; flowers whitish to yellowish (rarely orange).....	27
27. Anther bases caudate; capitula short-radiate (ray corollas short).....	<i>Ortizacalia</i>
27. Anther bases obtuse to auriculate; capitula discoid (native species).....	<i>Senecio</i>
28. Blades glabrous	29
28. Blades with indumentum	30
29. Blade margins plane; capitula 1–6-flowered; pappus 4–5-seriate, showy	<i>Stiffia</i>
29. Blade margins revolute; capitula 9–12-flowered, pappus uniseriate, not showy	<i>Feddea</i>
30. Blades adaxially white-arachnoid, glabrescent and abaxially densely ferruginous arachno- tomentose	<i>Nesampelos</i>
30. Blades with different indumentum	31

- 31. Capitula sessile to short-pedunculate; synflorescence scorpioid-cymose, subscorpioid
paniculate to glomeriform or seriate cymose32
- 31. Capitula pedunculate; synflorescence corymbiform, thyrsoïd, or paniculiform34
- 32. Synflorescence scorpioid-cymose, without foliaceous bracts; involucre bracts persistent
..... *Cyrtocymura*
- 32. Synflorescence subscorpioid paniculate to glomeriform or seriate cymose; capitula in 1 series
.....33
- 33. Synflorescence subscorpioid paniculate to glomeriform; capitula not subtended by foliaceous
bracts; flowers 2–9(–10) *Critoniopsis*
- 33. Synflorescence terminal or axillary, seriate cymose, with foliaceous bracts larger than the
capitula; involucre bracts spreading after fruit dispersal *Lepidaploa*
- 34. Capitula bilabiate; corolla bilabiate, yellow; style branches truncate *Trixis*
- 34. Capitula discoid; corolla tubular, whitish or lavender; style branches acute35
- 35. Involucre cylindrical; receptacle columnar; corolla yellow; pappus isomorphic, 2–3-seriate
..... *Llerasia*
- 35. Involucre mostly campanulate; receptacle plane to convex; corolla whitish or lavender;
pappus heteromorphic, 2-seriate36
- 36. Blades membranaceous; flowers 30–55; corolla lobes with short, stiff trichomes
..... *Quechualia*
- 36. Blades coriaceous or chartaceous; flowers 4–30; corolla with glandular trichomes
..... *Vernonanthura*
- 37. Blades coriaceous; capitula with 5, free, rigid involucre bracts; receptacle epaleaceous
..... *Mattfeldia*

37. Blades chartaceous; capitula with 6–13 involucre bracts; receptacle paleaceous	38
38. Stems often tomentose; involucre bracts without resin ducts; capitula calyculate; corolla liguliform and tubular	Leonis
38. Stem mostly glabrous; involucre bracts strongly resiniferous, with distinct, often blackish resin ducts; capitula ecalyculate; corolla bilabiate.....	Jungia
39. Plants with white latex	40
39. Plants without white latex, or exudate resinous (<i>Mikania</i> and <i>Perymeniopsis</i>)	41
40. Blades triangular, sagittate or lanceolate, margins mucronate-denticulate to coarsely dentate or deeply lobed; anther theca black; cypselae 6–10-ribbed.....	Munnozia
40. Blades widely ovate, margins entire or lightly denticulate; anther theca pale; cypselae usually 5-ribbed	Sinclairia
41. Leaves compound or deeply pinnatisect	42
41. Leaves simple	44
42. Stems winged	Verbesina
42. Stems cylindrical, wingless	43
43. Capitula nodding; cypselae obovate in outline, truncate at apex, black with two broad, ciliolate, stramineous, erose wings that are fused to the base of a cup (or corona) formed by the two fragile awns.....	Cyathomone
43. Capitula erect; cypselae triquetrous, quadrate, obovoid to oblong, linear or fusiform in outline, black to reddish brown, glabrous to densely pubescent, sometimes tuberculate, rarely winged	Bidens
44. Pappus of paleas or scales, uniseriate, linear or obovate, ciliate or erose, free	Calea
44. Pappus not as above	45

45. Capitulum calyculate; involucre bracts uniseriate	46
45. Capitulum ecalyculate; involucre bracts 2–several series.....	47
46. Leaves sessile or almost so; blades ovate to cordate.....	<i>Cabreriella</i>
46. Leaves petiolate; blades lanceolate, elliptic, or oblong.....	<i>Pentacalia</i>
47. Capitula radiate or disciform, heterogamous	49
47. Capitula discoid, homogamous	69
48. Blades < 1 cm long, bi-trilobed, spinulose.....	<i>Harnackia</i>
48. Blades > 1 cm long, entire	49
49. Ray flowers sterile or neuter	50
49. Ray or marginal flowers pistillate	54
50. Cypselae fleshy (baccate) at maturity	<i>Tilesia</i>
50. Cypselae dry at maturity.....	51
51. Paleas of receptacle enveloping and surpassing the cypselae	<i>Montanoa</i>
51. Paleas of receptacle enveloping but not surpassing the cypselae	52
52. Pappus of 2 easily caducous setae at angles of cypselae and a small rostrum bearing numerous minute and easily caducous squamellae	<i>Perymeniopsis</i>
52. Pappus aristate or absent	53
53. Cypselae biconvex, sometimes with elaiosomes; pappus of two-awned scales, and 2–4 short scales between them, or pappus absent	<i>Hymenostephium</i>
53. Cypselae rostrate, lacking elaiosomes; pappus reduced or aristate	<i>Elaphandra</i>
54. Cypselae with elaiosomes or scars left by them; carpodium usually bilobed, rarely absent	<i>Wedelia</i>
54. Cypselae without elaiosomes or scars; carpodium, if present, not lobed	55

55. Blades pinnately veined	56
55. Blades 3–5(–7)-plinerved	601
56. Blades shiny and sharply toothed at margins	<i>Narvalina</i>
56. Blades opaque, with margins not as above.....	57
57. Blades arachno-tomentose beneath; capitula calyculate	<i>Ekmaniopappus</i>
57. Blades with different indumentum below; capitula ecalyculate	58
58. Blades slightly discolor, abaxial surface glabrous to occasionally villous along larger veins; corolla tube papillose to pilose; cypselae epappose	<i>Electranthera</i>
58. Blades strongly discolor, abaxial surface densely tomentose; corolla tube glabrous; cypselae with pappus	59
59. Synflorescence axillary or terminal, with a subglomerate, spiciform, or racemose arrangement of capitula; capitula usually with 6–10 flowers; anther appendages papillose	<i>Oligactis</i>
59. Synflorescence terminal, with a corymbose arrangement of capitula; capitula with 16–50 flowers; anther appendages smooth	<i>Sampera</i>
60. Capitula disciform	61
60. Capitula radiate	62
61. Involucre globose or hemispherical; involucre bracts 1(–2)-seriate, subcoriaceous, striate; corolla of pistillate flowers tubular, 5-lobed; anthers not spurred	<i>Ichthyothere</i>
61. Involucre cylindrical or campanulate; involucre bracts 2–6-seriate, membranous, scarious; corolla of pistillate flowers tubular, 2–4-lobed; anthers spurred	<i>Clibadium</i>
62. Stems and blades abaxial surface usually densely white-tomentose; cypselae covered exclusively by twin hairs	<i>Liabum</i>

62. Stems, blades and cypsela with a different kind of indument	63
63. Leaves trilobed; capitula solitary, long pedunculate	<i>Sphagneticola</i>
63. Leaves not as above; capitula grouped in synflorescence	64
64. Cypsela with heteromorphic pappus (ray cypselae epappose and disc cypselae with pappus of bristles)	<i>Alloispermum</i>
64. Cypsela with homomorphic pappus (ray and disc cypselae similar)	65
65. Apical anther appendage glabrous; cypsela wingless; pappus of multiple bristles of different lengths and caducous	<i>Oteiza</i>
65. Apical anther appendage with glandular trichomes; cypsela winged; pappus 2–4-awned	66
66. Cypsela strongly asymmetrically winged	<i>Otopappus</i>
66. Cypselae symmetrically winged	67
67. Capitula clustered in groups of 3–6; pappus borne on a distinct rostrum or neck ...	<i>Zexmenia</i>
67. Capitula not clustered; pappus continuous with wings and body of cypselae	68
68. Pappus of 2–4 stout, erect or slightly recurved awns	<i>Tuxtla</i>
68. Pappus of 2(–4) erect awns and a few squamellae between them.....	<i>Oblivia</i>
69. Plants with resinous, colorless exudate; capitula with 4 involucre bracts and 4 flowers	<i>Mikania</i>
69. Plants without exudate; numbers of involucre bracts and flowers not as above	70
70. Stems seemingly leafless; leaves reduced to scales 1 mm long	<i>Lescaillea</i>
70. Stems with conspicuous leaves, > 1 mm long	71
71. Involucre bracts rounded at the apex, imbricate, 4–6-seriate, all caducous.....	72

71. Involucral bracts obtuse to acute at the apex, subimbricate, 2–4-seriate, persistent, inner or outer bracts caducous	73
72. Blades triangular and 3–5-lobed; corolla lobes glanduliferous; style branches wider at the distal portion	<i>Osmiopsis</i>
72. Blades not as above; corolla lobes glabrous; style branches filiform	<i>Chromolaena</i>
73. Blades with pinnate venation	74
73. Blades 3–5-plinerved	84
74. Involucral bracts 4, 2-seriate; corolla yellow; style branches truncate, penicillate	<i>Herodotia</i>
74. Involucral bracts with larger numbers and series; corolla whitish, cream, lavender, pink, or purple; style branches acute, rounded or obtuse, papillose, mammillate and pilose	75
75. Each flower subtended by a palea; pappus of 2–3 short bristles	<i>Salmea</i>
75. Flowers not subtended by paleas; pappus with more than 3 bristles	76
76. Capitula with 3–5 flowers; inner surface of corolla throat densely pilose	<i>Steyermarkina</i>
76. Capitula with more than 5 flowers; inner surface of corolla throat glabrous	77
77. Leaves petiolate, petioles 6–6.5 cm long; blade margins dentate	<i>Guayania</i>
77. Leaves sessile or petioles up to 5 cm long; blade margins entire or denticulate	78
78. Involucral bracts persistent	79
78. Inner or outer involucral bracts caducous	80
79. Corollas white; style branches densely short-papillose; cypselae 5-ribbed; carpodium strongly asymmetrical; pappus uniseriate	<i>Ayapana</i>
79. Corollas purple-roseus; style with trichomes extending below bifurcation; cypselae 10-ribbed; carpodium inconspicuous; pappus biseriate	<i>Trepadonia</i>

80. Style base cylindrical.....	81
80. Style base enlarged.....	83
81. Involucral bracts 25–40; flowers 20–80 per capitulum.....	<i>Hebeclinium</i>
81. Involucral bracts 7–20; flowers 5–20 per capitulum	82
82. Involucral bracts 2–4 in subequal series; corollas whitish to greenish yellow; cypselae with ribs and upper lateral surfaces bearing setulae	<i>Koanophyllon</i>
82. Involucral bracts 3–5-seriate, strongly unequal graduated series; corollas lilac, lavender or purple; cypselae glabrous or with a few setulae	<i>Asplundianthus</i>
83. Blade obtuse at apex; receptacle glabrous; flowers 4–10 per capitulum; style base glabrous	<i>Crossothamnus</i>
83. Blade acuminate at apex; receptacle puberulous; flowers 20–25 per capitulum; style base pubescent	<i>Condylopodium</i>
84. Anther apical appendage null or rudimentary; pappus fused in a ring of bristles or scales, or absent	<i>Ophryosporus</i>
84. Anther apical appendage conspicuous; pappus not fused into a ring or absent	85
85. Capitula clustered in axils of leaves	<i>Uleophytum</i>
85. Capitula in terminal synflorescences	86
86. Corolla outer surface usually densely puberulous, often glanduliferous; receptacle pubescent	<i>Bartlettina</i>
86. Corolla outer surface glanduliferous or glabrous; receptacle glabrous	87
87. Style base enlarged, glabrous or pubescent	88
87. Style base cylindrical (not enlarged), glabrous	92
88. Pappus usually caducous.....	<i>Ageratina</i>

88. Pappus persistent	89
89. Flowers ≥ 20 per capitulum	90
89. Flowers 3–12 per capitulum	91
90. Flowers ~20 per capitulum; receptacle slightly convex; corolla greenish white to light yellow; style branches distally enlarged into a fusiform tip	<i>Gongrostylus</i>
90. Flowers 20–80 per capitulum; receptacle flat; corolla white or pink; style branches linear to broadly linear	<i>Heterocondylus</i>
91. Blade decurrent onto petiole; carpopodium asymmetrical	<i>Condylium</i>
91. Blade not decurrent on petiole; carpopodium symmetrical	<i>Austrobrickellia</i>
92. Leaves with translucent, internal secretory pockets between veins; outer involucre bracts caducous	<i>Critonia</i>
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93. Blades surface bullate	94
93. Blades surface flat (not bullate)	96
94. Blades cordate at base; capitulum pedicellate; flowers 38–40 per capitulum	<i>Aristeguetia</i>
94. Blades rounded at base; capitulum sessile; flowers 6–22 per capitulum	95
95. Blades 5-plinerved, margin crenate; flowers ~22 per capitulum	<i>Hebeclinium</i>
95. Blades 3-plinerved, margins serrate; flowers 6–10 per capitulum	<i>Asplundianthus</i>
96. Corolla lobes glandular-pubescent on outer surface; apical anther appendage wider than long	<i>Koanophyllon</i>
96. Corolla lobes glabrous; apical anther appendage longer than wide	97

97. Stems partly reddish brown; leaf blade with acute apex, margins slightly denticulate; cypselae distally short setulose, proximally glabrous; carpodium slightly percurrent onto ribs*Hughesia*
97. Stems not reddish brown; leaf blade with caudate apex, margins entire; cypselae prismatic, sparsely setuliferous mostly on ribs; carpodium symmetrical, forming a basal ring *Santosia*

ACHYROCLINE (Lessing) de Candolle, Prodr. 6: 219. 1838.

Erect perennial herbs or subshrubs, rarely scrambling. Leaves alternate, simple, sessile; blades with entire or erose margins, base cordate, truncate, attenuate into a pseudo-petiole, sometimes semi amplexicaulous or decurrent forming a wing, pinnate or triplinerved. Synflorescence corymbiform, paniculiform, rarely solitary; capitula disciform, heterogamous. Involucre cylindrical, fusiform or campanulate; involucre bracts < 30, imbricate in 3–5 series, papery or membranaceous, colored (white, yellow, stramineous, rufous), stereome divided; receptacle flat, epaleate. Capitula with < 20 flowers, outer flowers (1–2 series) pistillate, corolla tubular or tubular-filiform; disc flowers bisexual, corolla tubular; anthers not spurred, caudate, with flat appendages; style branches truncate, with hairs apically. Cypselae cylindrical, glabrous, or papillose; pappus bristles capillary, barbellate, free white, yellowish or rufescent.

Distinctive features: Scrambling subshrubs, with white-tomentose pubescence; leaves alternate, triplinerved, sessile, with long decurrent base; involucre bracts colored, stereome divided; and corolla yellow.

Distribution: A New World genus of ~44 species distributed from northern Mexico to southern South America, with 34–36 species occurring in the Neotropics. Only *A. scandens* V.M. Badillo

from Venezuela is a scrambling subshrub that reaches 1–2 meters in length; open woodlands of the Andean temperate and humid zone of Venezuela; 2,700–3,000 m.

AGERATINA Spach, Hist. Nat. Vég. Phan. 10: 286. 1841.

Erect herbs or shrubs, rarely scrambling shrubs or vines. Stem obtusely quadrangular or



Ageratina havanensis, photo by P. Acevedo.

terete, sulcate or striate, reaching a few meters in length. Leaves opposite (in climbing species), simple, petiolate; blades narrowly elliptic to deltoid, entire or serrate, ovate, triplinerved, commonly with glandular punctations.

Synflorescence laxly to densely corymbiform; capitula discoid, homogamous. Involucre campanulate; involucre bracts green or reddish tinged, ~30, eximbricate to weakly subimbricate, in 2–3 subequal series, persistent, spreading at maturity; receptacle slightly convex, glabrous. Capitula with 5–60 flowers, bisexual, corolla tubular, white or lavender, with 5 triangular lobes, distinctly longer than wide, inner surface densely papillose, outer surface smooth, glabrous or glanduliferous; apical anther appendage longer than wide, anther collar cylindrical; style base usually enlarged, glabrous, style branches linear, densely papillose, usually glandular. Cypselae prismatic or fusiform, 5-ribbed, setuliferous and/or glanduliferous; carpodium distinct,

symmetrical; pappus of 5–40 scabrid, uniseriate, usually caducous, often with shorter outer series of setae.

Distinctive features: Subwoody, scrambling vines with obtusely quadrangular, sulcate or striate stems; opposite, simple, triplinerved leaves; homogamous capitula; corolla lobes mostly papillose inside; filament collar cylindrical; style base usually enlarged, somewhat bulbous; and pappus usually caducous.

Distribution: A New World genus of ~265 species distributed from North America south to W South America and the West Indies, introduced in parts of the Old World. *Ageratina ovilla* (Standl. & Steyerl.) R.M. King & H. Rob. from S Mexico and Guatemala, *A. reticuliflora* (Standl. & L.O. Williams) R.M. King & H. Rob from Costa Rica, *A. gracilis* (Kunth) R.M. King & H. Rob. from Colombia, and *A. havanensis* (Kunth) R.M. King & H. Rob. are the only species in the genus consistently reported as vines; moist forests; 2,000–2,700 m.

ALLOISPERMUM Willdenow, Ges. Naturf. Freunde Berlin Mag. Neuesten Entdeck.

Gesamten Naturk. 1: 139. 1807.

Perennial herbs or shrubs, sometimes scrambling. Leaves opposite, simple, subsessile to petiolate; blades linear-lanceolate to ovate, triplinerved. Synflorescence lax or congested paniculiform or corymbiform; capitula radiate, heterogamous, rarely discoid. Involucre narrowly campanulate to hemispheric; involucre bracts in 3–4 series, gradate, membranaceous, scarious; receptacle flat to convex, paleaceous, palea lanceolate to filiform, flat, persistent. Ray flowers 5, pistillate, corolla liguliform, white or purplish, apices shallowly to moderately trilobed; disc flowers 15–20, bisexual, corolla tubular, yellow; apical anther appendages ovate; style filiform, exserted, style branches revolute. Cypselae obconical, blackish to brownish purple, ray cypselae

glabrous, disc cypselae glabrous or pubescent; pappus absent in ray cypselae, disc cypselae with a pappus of several (~20), very narrowly lanceolate, tapered, barbellate scales, resembling bristles.

Distinctive features: Scrambling vines; leaves opposite, triplinerved; and cypselae with heteromorphic pappus (ray cypselae epappose, disc cypselae with pappus of bristles).

Distribution: A neotropical genus with ~15 species; confined to montane habitats of Mexico, Central America, and northern Andes. Only two species (*A. steyermarkii* H. Rob. from Colombia and Venezuela and *A. weberbaueri* H. Rob. from Peru) are reported as scrambling shrubs or vines; in evergreen scrubs; 1,900–3,000 m.

ARCHIBACCHARIS Heering, Jahrb. Hamburg. Wiss. Anst. 21 Beih. 3: 40. 1904.

Functionally dioecious or vestigially gynomonocious, perennial herbs, erect or



Archibaccharis hirtella, photo by P. Acevedo.

scrambling shrubs, or twining vines, sometimes reaching > 5 m long; pubescence of stipitate or sessile glands, not glutinous. Leaves alternate, petiolate or sessile; blades simple, denticulate to serrate at margins, pinnatinerved. Synflorescence terminal or axillary, strongly

cymose or corymbose; capitula disciform, heterogamous. Involucre campanulate; involucre bracts 3–5-seriate, gradate; receptacle epaleaceous. Female capitula with outer flowers pistillate,

corolla tubular-filiform, sometimes with staminodes and central sterile disc flowers (anthers usually not functional and cypselae abortive); style branches hispidulous outside. Male capitula usually with sterile gynoecium. Cypselae compressed, ovate to oblong, 2–5(–7)-ribbed, mostly 3-angled; pappus 1–2-seriate, bristles not elongating at maturity, usually dilated apically in staminate flowers and sometimes in pistillate flowers.

Distinctive features: Recognized by the presence of bisexual (but sterile) flowers in the center of the female capitula and by its compressed, 2–5-ribbed cypselae. Confused with *Baccharis* that differs by the female capitula wholly of pistillate flowers and the terete, 5–20-ribbed cypselae (Jackson 1975).

Distribution: The genus is mainly Mexican and Central American, known from Colombia but probably ranges to Bolivia and includes ~32 species, four of which are described as vines or scandent shrubs; common on relatively recent volcanic soils or disturbed habitats; (100–)700–3,900 m.

ARISTEGUIETIA R.M. King & H. Robinson, *Phytologia* 30: 218. 1975.

Shrubs to small trees, rarely scrambling vines. Leaves opposite, petioles mostly short;



blades mostly broadly ovate to lanceolate, margins usually crenulate to dentate, venation triplinerved (in climbing species), upper surface often bullate. Synflorescence corymbiform, lower branches usually opposite; capitula discoid, homogamous,

Aristeguietia lamiifolia, photo by J. Ampudia.

pedicellate. Involucre campanulate; involucre bracts 25–70, subimbricate, in 4–6 unequal, gradate series, a few innermost sometimes caducous; receptacle flat, convex, rarely conical, glabrous. Capitula with 13–100 flowers, bisexual, corolla tubular, bluish, lavender, purple, or pink, glabrous, lobes triangular, slightly longer than wide; apical anther appendage large, longer than wide, anther collar narrowly cylindrical; style base not enlarged, glabrous, style branches broadly strap-shaped, mammillate. Cypselae prismatic, 5-ribbed usually setulose; carpodium indistinct; pappus of 30–45 scabrid persistent bristles congested in 1–2 series, scarcely spreading at maturity.

Distinctive features: Distinguished by the opposite leaves with slightly to strongly bullate upper surfaces, and usually crenate to dentate margins, subimbricate involucre with the few innermost bracts sometimes caducous, bluish and glabrous corollas and mammillate style branches.

Distribution: A predominantly Andean genus of 21 species of which only *A. lamiifolia* (Kunth) R.M. King & H. Rob., from Colombia and Ecuador, in addition to being a shrub, grows as a scrambling shrub; 170–3,000 m.

ASPLUNDIANTHUS R.M. King & H. Robinson, *Phytologia* 30: 224. 1975.

Erect to scrambling shrubs, or trees. Leaves opposite; blades ovate to lanceolate, serrulate, serrate or entire, triplinerved from or near base or pinnately veined. Synflorescence usually corymbose-paniculiform; capitula discoid, homogamous. Involucre cylindrical; involucre bracts 15–20, subimbricate, in 3–5 markedly unequal, gradate series, inner bracts caducous; receptacle flat, glabrous. Capitula with 6–10



Asplundianthus smilacinus, from Sneidern 2731 (US).

flowers, bisexual; corolla tubular, lilac, lavender or purple, narrowly funnelform, usually with glands on outer surface; apical anther appendage longer than wide, anther collar narrowly cylindrical; style base not enlarged, glabrous, style branches narrowly linear, mammillate. Cypselae prismatic, 5-ribbed, glabrous or sparsely setulose, rarely with a few glands; carpodium distinct; pappus setae 30–40, slender scabrid persistent bristles.

Distinctive features: Scrambling shrubs; synflorescence corymbose-paniculiform; with dense glomerate clusters of capitula; involucre cylindrical; capitula with 6–10 flowers, and inner involucre bracts caducous.

Distribution: A northern Andean genus of 11 species, five of which are climbers; *A.*

pseudostuebelii R.M. King & H. Rob. and *A. toroi* (B.L. Rob.) R.M. King & H. Rob. from

Colombia, *A. smilacinus* (Kunth) R.M. King & H. Rob. from Colombia and Ecuador, and *A.*

scabrifolius (B.L. Rob.) R.M. King & H. Rob. and *A. stuebelii* (Hieron.) R.M. King & H. Rob. from Peru; montane forests; 1,900–3,000 m.

AUSTROBRICKELLIA R.M. King & H. Robinson, *Phytologia* 24: 72. 1972.

Erect or scrambling subshrubs or shrubs. Leaves opposite, with distinct slender petioles;



Austrobrickellia patens, photo by Natalija Shevyreva.

blades ovate, bases obtuse to truncate, margins entire to sharply dentate, triplinerved from or near the base.

Synflorescence lax, leafy paniculate, branches densely corymbose at tips; capitula discoid, homogamous.

Involucre campanulate;

involucral bracts 6–20, subimbricate, in 2–4 unequal, gradate series, persistent, spreading when aged or dried; receptacle flat to slightly convex, glabrous. Capitula with 3–12 flowers, bisexual; corolla tubular, glabrous on outer surface or with few minute glands on lobes, greenish white to purple; apical anther appendages oblong, about twice as longer as wide, anther collars cylindrical; style base enlarged, with numerous slightly distorted, ascending hairs, style branches long clavate, mostly smooth. Cypselae prismatic, 5-ribbed, with setae often restricted to ribs, with or without glands on sides; carpodium distinct; pappus of 30–35 persistent scabrid bristles in one series.

Distinctive features: Recognized by the subimbricate involucre bracts in 2–4 unequal gradate series, long clavate style branches, pubescent node at the base of the style and 5-ribbed cypselae.

Distribution: A southern South American genus of three species, two of which sometimes grow as climbers; *A. arnottii* (Baker) R.M. King & H. Rob. and *A. patens* (Hook. & Arn.) R.M. King & H. Rob. from Bolivia; scrubs and savannas; 100–3,200 m.

AYAPANA Spach, Hist. Nat. Vég. Phan. 10: 290. 1841.

Perennial herbs, erect or rarely scrambling, reaching ~3 m in length. Leaves opposite, short- to long-petiolate; blades narrowly ovate to elliptic, margins entire to serrulate, pinnately veined. Synflorescence laxly or densely corymbiform; capitula discoid, homogamous, pedicellate or sometimes sessile. Involucre campanulate; involucre bracts 15–35, subimbricate, in 4–5 gradated series, persistent, spreading at maturity; receptacle convex, glabrous. Capitula with 5–40 flowers, bisexual; corolla tubular, with glands on outer surface of lobes, white or pink; apical anther appendage triangular to oblong, slightly longer than wide, anther collar cylindrical; glabrous, with enlarged pubescent base, style branches filiform, densely long-papillose. Cypselae prismatic, 5-ribbed, setulose mostly on ribs; carpodium with distinct upper rim, slightly asymmetrical; pappus of 20–40 slender, scabrous, persistent bristles.

Distinctive features: Scrambling herbaceous vines with opposite, simple, pinnately veined leaves; style branches with long papillae and style base with pubescent node.

Distribution: A neotropical genus of 17 species, three of which are facultative climbers; *A. lanceolata* R.M. King & H. Rob. from Peru and Bolivia, *A. pilluanensis* (Hieron.) R.M. King & H. Rob. from Peru and *A. towarensis* (B.L. Rob.) R.M. King & H. Rob. from Venezuela; lowland, non-flooded moist forest, primary or disturbed forests; 100–1,750 m.

BACCHARIS Linnaeus, Sp. Pl. 860. 1753 (nom. cons.).

Dioecious (rarely monoecious) shrubs or subshrubs, erect or sometimes scrambling;



Baccharis trinervis, photo by P. Acevedo.

indumentum variable (trichomes uniseriate flagellate, clavate and/or filiform, bifid, glandular biseriata forming tiny tufts similar to resinous spots), rarely glabrous; stem striated or winged as a prolongation of the leaf blade. Leaves alternate, rarely subopposite; blades simple, with denticulate or entire margins, plinerved. Synflorescence pyramidal, with corymbiform, glomeriform or spiciform branches, or reduced to solitary capitulum; capitula disciform, heterogamous or discoid, homogamous, sessile or pedunculate. Involucre campanulate or cylindrical; involucre bracts foliaceous or scaly, imbricated.

Male capitula epaleaceous; corolla tubular, external surface with biseriata trichomes, glandular or not, or with uniseriate, papillary lacinia at the apex; anthers forming an included tube; pappus usually uniseriate, persistent, apex of bristles thickened or not. Female capitula paleaceous or epaleaceous; corolla tubular-filiform sometimes with subapical crown of trichomes, style usually exserted. Cypselae usually blackish, 2–20-ribbed, glabrous or hairy; pappus uniseriate or multiseriate, apex of bristles usually not thickened.

Distinctive features: Scrambling vines characterized by a tufted indumentum of trichomes with several adjoining basal cells on leaves and stems and functionally unisexual flowers (Heiden et al. 2019).

Distribution: A New World genus of ~442 species, distributed from North America south to southern South America including the Antilles, with an important center of distribution in the eastern slope of the Andes. According to Heiden et al. (2019) 26 species in the Neotropics are climbers, distributed in Mexico, Central and South America and some of the Lesser Antilles; savannas, edge of forests, and subtropical grasslands; 35–3,200 m.

BARTLETTINA R.M. King & H. Robinson, *Phytologia* 22: 160. 1971.

Erect shrubs or small trees, three species scrambling vines with hexagonal stems reaching 5 m in length; pubescence of purplish hairs. Leaves opposite, with long slender petioles; blades triangular, cordate at base, with crenate-dentate margins, trinerved. Synflorescence laxly wide pyramidal-paniculiform; capitula discoid, homogamous, pedicel short. Involucre campanulate; involucre bracts ~50, subimbricate, in 4 unequal gradated series, inner bracts caducous; receptacle broadly convex, sparsely pubescent. Capitula with 25–40 flowers, bisexual; corolla tubular glabrous, purple; apical anther appendage ovate, large, longer than wide, anther collars very elongate; style base not enlarged, glabrous, style branches narrowly linear, mammillate. Cypselae prismatic, 5-ribbed, glabrous to sparsely setuliferous; carpopodium slightly enlarged, symmetrical; pappus of 40–45 slender scabrid persistent bristles in 1–2 series.

Distinctive features: Scrambling vine with purple pubescence and opposite, triangular leaves with long petioles; and purple corolla.

Distribution: A neotropical genus of ~37 species from Central and South America, of which *B. campii* R.M. King & H. Rob. (Ecuador, Colombia), *B. cleefii* R.M. King & H. Rob. (Colombia) and *B. tenorae* (Aristeg.) R.M. King & H. Rob. (Venezuela) are described as climbers; 1,830–2,880 m.

BERYLSIMPSONIA B.L. Turner, *Phytologia* 74: 351. 1993.

Scrambling vines to 5 m long, with a pair of recurved axillary thorns, these persistent



Berylsimpsonia crassinervis, photo by P. Acevedo.

after leaves have fallen off. Stems cylindrical, reaching ~1 cm diam. at the base; bark corky, peeling off in rectangular plates; cross section with regular vascular anatomy, xylem dissected by numerous conspicuous rays. Leaves alternate, distichous, petiolate; blades simple, margins

entire, serrate, or spinulose, pinnatinerved. Synflorescence axillary racemiform; capitula bilabiate, homogamous. Involucre turbinate, not calyculate; involucre bracts in 3–4 series; receptacle pubescent, epaleaceous. Capitula with 3–6 flowers, bisexual, corolla bilabiate, yellow; anthers exserted, apical appendage acute; style filiform, with 2 reflexed stigmatic branches. Cypselae fusiform or oblanceolate, pubescent, pilose, or glandular; pappus exclusively of barbellate bristles.

Distinctive features: Woody, scrambling vines with a pair of recurved axillary thorns at the nodes, often with spinulose margined leaves, bilabiate homogamous capitula, and yellow corolla.

Distribution: An Antillean genus of two species, *B. vanillosma* (Wright) B.L. Turner, distributed in Cuba, Hispaniola, and Puerto Rico, and *B. crassinervis* (Urb.) B.L. Turner endemic to Hispaniola; moist to seasonally dry forests and thickets on limestone, serpentine or bauxite substrates; 0–800 m.

BIDENS Linnaeus, Sp. Pl. 831. 1753 (nom. cons.).

Annual or perennial herbs, less frequently shrubs, scrambling or weakly twining



Bidens urbanii, photo by P. Acevedo.

herbaceous vines. Leaves opposite, petioles and rachis narrowly winged or absent; blades simple or 1–3-pinnatisect, pinnatinerved. Synflorescence terminal or axillary, corymbiform or capituliform; capitula radiate and heterogamous or discoid

and homogamous, pedunculate. Involucre campanulate to hemispherical; involucre bracts in 2 unequal series, dimorphic, the outer ones generally foliaceous and narrower, the inner ones wider, with hyaline or scarious margins; receptacle flat to slightly concave, paleaceous, palea flat to conduplicate, membranous. Ray flowers, when present, 5–12, and usually sterile, rarely pistillate, corolla liguliform, yellow, white, or orange. Disc flowers few or numerous, bisexual, corolla tubular, mostly yellow to orange; anthers generally black, apical appendage ovate, glabrous, filament glabrous; style branches deltate, penicillate on the abaxial surface. Cypselae

dorsiventrally compressed, triquetrous, quadrate, obovoid to oblong, linear or fusiform in outline, black to reddish brown, glabrous to densely pubescent, sometimes tuberculate, rarely winged; pappus absent or mostly 2 to few awns or scales, awns usually retrorsely barbed, rarely glabrous.

Distinctive features: Scrambling or weakly twining vines with opposite, simple to 1–3-pinnatisect leaves; flattened, trigonal or tetragonal, fusiform cypselae; and aristate pappus with retrorse trichomes.

Distribution: A cosmopolitan genus of ~340 species, 104 present in the Neotropics, of which only seven are reported as scrambling vines; Mexico south to Brazil including the West Indies; moist open habitats; 100–1,000 m.

CABRERIELLA Cuatrecasas, Bol. Soc. Argent. Bot. 19: 15. 1980.

Scrambling shrubs or lianas; stems terete, usually striate, glabrous or glabrescent, reaching 2–3(–4) m in length. Leaves opposite, sessile or nearly so; blades simple, coriaceous or somewhat fleshy, ovate to cordate, acute at apex, glabrous, margins denticulate to dentate, pinnati- or somewhat palmati-nerved. Synflorescence terminal or subterminal, corymbiform (sometimes paniculiform); capitula discoid, homogamous or radiate, heterogamous. Involucre cylindrical to campanulate, calyculate; involucre bracts uniseriate, 8 or 13, free, acute at apex; calyculus 3–7 bracts; receptacles flat, epaleaceous, alveolate. Ray flowers (when present) 10–15, pistillate, corollas liguliform, yellow. Disc flowers 18–47, bisexual, corolla tubular, 5-lobed, yellow or white; apical anther appendage oblong-elliptic, anther bases sagittate; style branches truncate with sweeping trichomes. Cypselae cylindrical, 5-costate, glabrous; pappus of numerous, caducous, capillary, scabridulous bristles.

Distinctive features: Scrambling, vines or lianas with opposite, sessile leaves; involucre calyculate; sagittate anther bases; and truncate style branches.

Distribution: A genus of two species restricted to northeastern Colombia, i.e., Sierra Nevada de Santa Marta and Sierra de Perijá; paramo and subparamo habitats; 2,500–3,200 m.

CALEA Linnaeus, Sp. Pl. ed. 2, 1179. 1763.

Shrubs sometimes with woody xylopodia and tuberous roots, erect herbs, scrambling



Calea pinnatifida, photo by P. Acevedo.

vines or small trees. Leaves opposite, sessile or petiolate; blades with entire to serrate margins, pinnately veined to trinerved. Synflorescence thyrsoid, paniculiform or corymbiform, or capitula solitary; capitula radiate, heterogamous or discoid,

homogamous. Involucre cylindrical to hemispherical; involucre bracts in 2–8 series, subequal to gradate, sometimes dimorphic; receptacles flat to conical, usually paleaceous. Ray flowers, when present, pistillate, corolla liguliform, yellow or rarely white. Disc flowers bisexual, corolla tubular, yellow or less commonly white or purplish; anthers yellow to brownish, shortly sagittate at base, apical appendage acute; style branches truncate, penicillate. Cypselae obconical or obpyramidal, black or brown, glabrous to densely pubescent, sometimes glandular; pappus of

multiple unequal or subequal paleas or scales, linear or tapered, rarely obovate, ciliate or erose, shorter or as long as the disc corolla, sometimes an erose crown.

Distinctive features: Scrambling vines with flat to conical receptacles that are usually paleaceous; ray flowers (when present) pistillate; corollas yellow, rarely whitish; anthers yellow; cypselae black or brown; and pappus composed of paleas or scales, free.

Distribution: A genus of ~125 species with neotropical distribution, but most species from northeastern South America and northeastern Brazil, with only 15 species reported as climbers; open hillsides, dry rocky limestone banks, scrub woodlands, savannas, or gallery forests; 90–520 m.

CHROMOLAENA de Candolle, Prodr. 5: 133. 1836.

Erect or scrambling herbs or shrubs, 2–5(–10) m long; stems cylindrical, usually



Chromolaena odorata, photo by P. Acevedo.

pubescent; cross section (in *C. odorata* (L.) R.M. King & H. Rob. ~2.5 cm in diam.), xylem dissected by numerous wide rays, deep phloem wedges, and white medulla with large, parenchyma cells.

Leaves opposite, rarely alternate or verticillate, sessile or petiolate;

blades simple, often dentate, usually triplinerved from the base. Synflorescence usually thyrsoid with corymbose branches, rarely with solitary heads; capitula homogamous, discoid. Involucre cylindrical; involucre bracts 18–65, densely imbricated in 3–12 strongly unequal gradated

series, green, white, stramineous or purplish, totally caducous, outer bracts falling first. Capitula with 6–75 flowers, bisexual; corolla tubular, shortly 5-lobed, the lobes glabrous or papillose or glandular, blue, lavender, purple or less often white; apical anthers appendages oblong longer than wide; style base not enlarged, glabrous, style branches narrowly linear to slightly broadened distally, sparsely mammillate to densely long-papillose. Cypselae prismatic, usually with 3–8 longitudinal ribs, setulose mostly on ribs, sometimes with glands, carpodium distinct; pappus with 20–50 slender, scabrid persistent bristles in 1 series.

Distinctive features: Erect or scrambling herbs or shrubs up to 5(–10) m long; stems slender cylindrical; leaves opposite, simple, serrate; involucre bracts 18–65, densely imbricated in 3–12 strongly unequal gradated series, green, white, stramineous or purplish, totally caducous at maturity; corolla blue, lavender or purple; and stigmas erect, exserted.

Distribution: A genus of 166 species of which only seven species have been reported as scrambling shrubs or vines; distributed from the southern United States to southern South America, including the Antilles; edge of moist forests or disturbed vegetation; 300–2,000 m.

CLIBADIUM Linnaeus, Mant. 161. 1771.

Shrubs to ~2 m tall, stems sometimes scrambling vines. Leaves opposite, petiolate; blades broadly ovate, apex acute to acuminate, base rounded, truncate or cuneate, margins serrulate, strigose or hirsute, 3- or 5-plinerved. Synflorescence terminal, loosely paniculiform to corymbiform; capitula disciform, heterogamous, sessile to pedunculate. Involucre cylindrical, campanulate, hemispherical; involucre bracts in 3 series, subequal, membranous, scarios, the inner enclosing the marginal cypselae, greenish to purple, sometimes white; receptacles flat to shallowly convex, paleaceous, sometime paleas only on base at pistillate flowers. Pistillate

flowers 5–6, uniseriate, corolla tubular, 3-lobed, sometimes weakly zygomorphic, cream to white colored, style branches acute to acuminate, papillose. Disc flowers 5–8, functionally staminate, corolla tubular, 4–5 lobed, cream to white colored; anthers black or black-purple, calcarate, apical anther appendages with glandular trichomes. Cypselae transversely compressed, obovoid to obpyriform, black to blackish purple, glabrous to variously pubescent, especially at apices; pappus absent or rarely formed by a tuft of trichomes or short edges.

Distinctive features: Scrambling vines with disciform, heterogamous capitula; pistillate flowers with tubular, 3-lobed corolla; staminate flowers with 4–5-lobed corolla, the anthers calcarate, purple or blackish; and pappus absent.

Distribution: A neotropical genus of 24 species, with only two species described as climbers, *C. pentaneuron* S.F. Blake (Colombia) and *C. arriagadae* Pruski (Ecuador); wet montane forests, secondary vegetation; (50–) 300–2,300 m.

CONDYLIDIUM R.M. King & H. Robinson, *Phytologia* 24: 380. 1972.

Herbs or scrambling vines; stem terete, striated, villous to pubescent. Leaves opposite, short-petiolate, petioles winged to near base; blades ovate to ovate-lanceolate, margin serrate to subentire, base attenuate, triplinerved from near the base. Synflorescence thyrsoid-paniculate,

with laxly divaricately cymose branches; capitula discoid, homogamous, pedicels mostly short.

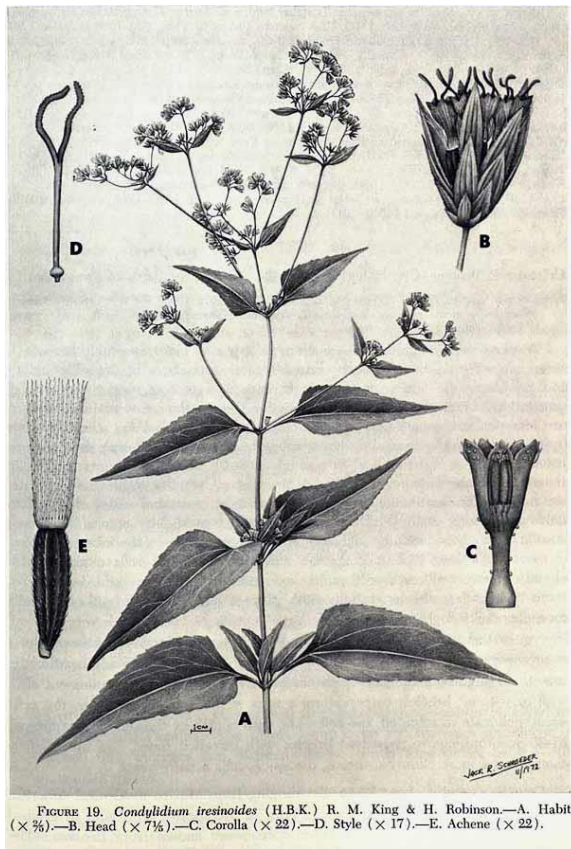


FIGURE 19. *Condylidium iresinoides* (H.B.K.) R. M. King & H. Robinson.—A. Habit ($\times \frac{1}{2}$).—B. Head ($\times 7\frac{1}{2}$).—C. Corolla ($\times 22$).—D. Style ($\times 17$).—E. Achene ($\times 22$).

Condylidium iresinoides, from King & Robinson, Genera of Eupatoriae.

Involucral bracts 15, subimbricate, in 5 series, unequal and gradated, persistent; receptacle flat to slightly convex, glabrous. Capitula with 5–6 flowers, bisexual; corolla tubular, with a short constricted basal tube, with abruptly and rather narrowly campanulate limb, lobes triangular, smooth on both surfaces, white; apical anther appendage slightly longer than wide, anther collar cylindrical; style base enlarged, densely short-hirsute, style branches linear, densely long-papillose. Cypselae prismatic, 5-ribbed, ribs setulose; carpopodium asymmetrical, pappus of scabrid and persistent bristles.

Distinctive features: Scrambling vines;

synflorescence with laxly divaricately cymose branches; involucral bracts in 5 series; style base enlarged, densely short-hirsute, the style branches linear, densely long-papillose; and carpopodium asymmetrical.

Distributions: A genus of two species, with *C. iresinoides* (Kunth) R.M. King & H. Rob. as the only climbing species; widely distributed in Central and South America; forest edges, scrubs, and disturbed roadside vegetation; 315–1,300 m.

CONDYLOPODIUM R.M. King & H. Robinson, Phytologia 24: 397. 1972.

Erect or scrambling shrubs, moderately branching with widely spreading branches; stems terete, densely pubescent. Leaves opposite, petioles distinct, short; blades broadly elliptical, base cuneate or rounded, margins entire to remotely serrulate, pinnately veined. Synflorescence broadly pyramidal-paniculate; capitula discoid, homogamous, pedicels short. Involucre campanulate; involucre bracts 20–30, subimbricate, in 4–5 unequal gradated series, inner bracts caducous, densely pubescent on outer surface; receptacle slightly convex, puberulous. Capitula with 20–25 flowers, bisexual; corolla tubular, with glands on distal portion of outer surface, lobes oblong-ovate, smooth on both surfaces, greenish white; apical anther appendage oblong-ovate, slightly longer than wide, anther collars cylindrical; style base enlarged, pubescent, style scarcely to distinctly long-clavate, mammillate. Cypselae prismatic, 5-ribbed, sparsely setulose and minutely glandular along the sides; carpopodium short, stopper shaped; pappus of 30–40 scabrid persistent contiguous bristles in 1 series.

Distinctive features: Laxly branched scrambling shrubs with densely pubescent stems; large pinnately veined leaves; involucre with caducous inner bracts; receptacle puberulous; and style base enlarged and pubescent.

Distribution: A genus of 6 species from NW South America, 4 of which (*C. cuatrecasatii* R.M. King & H. Rob., *C. hyalinifolium* S. Díaz & G.P. Méndez, and *C. pennellii* R.M. King & H. Rob. from Colombia, and *C. fuliginosum* (Kunth) R.M. King & H. Rob. from Colombia and Ecuador) are facultative climbers or vines; occurring in dense woods; 1,200–2,400 m.

CRITONIA P. Browne, Civ. Nat. Hist. Jamaica 490. 1756.

Shrubs to small trees, sometimes scrambling vines; stems terete to quadrangular or hexagonal, striate, often fistulose, glabrous to densely villous. Leaves opposite, distinctly

petiolate, petioles sometimes broadly winged; blades elliptical to broadly ovate, with translucent



Crotalaria morifolia, photo by O. López.

secretory spots between veins, base acute to subtruncate or hastate, margins entire to serrate, pinnately veined or triplinerved from above the base.

Synflorescence usually thyrsoid-paniculate; capitula discoid,

homogamous, either pedicellate or

sessile in often dense clusters. Involucre

usually cylindrical to fusiform; involucre bracts ~20–25, subimbricate to weakly imbricate, in 4–6 unequal gradated series, all but the outer series easily caducous; receptacle flat to slightly convex, glabrous. Capitula with 4–12 flowers; corolla tubular, whitish, glabrous outside or rarely with a few glands on lobes, these oblong to long-triangular; apical anther appendages large, scarcely to distinctly longer than wide, anther collar moderately narrow; style base not enlarged, glabrous, style branches filiform to slightly spatulate, smooth to slightly mammillate. Cypselae prismatic, 5-ribbed, carpodium a narrow rim or short cylinder; pappus 25–35, persistent, scabrid, congested bristles in 1 series.

Distinctive features: Scrambling shrubs with simple, opposite leaves with pellucid punctations; leaves 3–5-plinerved (in all climbing species); weakly imbricate involucre; capitula with 4–12 flowers; and unenlarged style bases.

Distribution: A neotropical genus of 46 species, with only nine species reported as vines, these occurring from southern Mexico to Ecuador; tropical wet forests, subtropical deciduous forests on steep slopes; 200–1,800 m.

CRITONIOPSIS Schultz-Bip., Jahresber. Pollichia 20–21: 430. 1863.

Shrubs, small trees, sometimes scrambling or leaning shrubs to 7 m long; branches and leaves often with stellate hairs, lepidote, peltate or strigose, rarely tomentose or pubescent; sapwood blackish in some species (e.g., *C. boliviana* (Britton) H. Rob.). Leaves alternate or opposite, petiole often lobed or winged; blades pinnately veined. Synflorescence subscorpioid, paniculate to glomeriform; capitula discoid, homogamous, pedunculate. Involucre campanulate or cylindrical; involucre bracts 18–25(–35) in 4–7 series, the inner ones caducous; receptacle convex, plane, glabrous, epaleaceous. Capitula with 2–10(–16) flowers, bisexual; corolla lobes often recurved, with small glands and hairs, white to lavender; apical anther appendage without glands, anther thecae without basal tails or with denticulate tails having thin-walled cells; style usually with distinct broadened sclerified basal ring, style branches with blunt-tipped hairs. Cypselae 5–10-ribbed; pappus of two series, cream to whitish, inner bristles, cylindrical, barbellate, outer series dorsiventrally compressed, narrowly triangular, ciliate.

Distinctive features: Scrambling shrubs, with alternate, pinnately veined leaves; heads with caducous inner involucre bracts, and few flowers with pubescent corolla lobes; and anther bases calcarate.

Distribution: A genus of ~50 species from Mexico to South America, with four species that in addition to being shrubs, sometimes grow as climbers, these occurring in Colombia, Ecuador, and Bolivia; montane wet forests, 1,300–3,600 m.

CROSSOTHAMNUS R.M. King & H. Robinson, Phytologia 24: 77. 1972.

Erect shrubs or scrambling woody vines; stems terete, densely puberulous and glandular-punctate. Leaves opposite, short-petiolate; blades ovate, apex obtuse, bases rounded to subtruncate, serrulate to subserrulate, upper surface glabrous, lower surface pubescent or densely glandular-punctate and tomentellous, venation pinnate. Synflorescence thyrsoid-paniculate, with branches rather densely corymbose; capitula discoid, homogamous. Involucre campanulate, involucre bracts ~20, in 3–4, strongly unequal, gradated series, densely puberulous and glanduliferous on outer surface; receptacle flat, glabrous. Capitula with 4–10 flowers; corollas white, greenish yellow, tubular, slightly funnelform, glanduliferous on outer surface, lobes slightly longer than wide, smooth on both surfaces; anther apical appendages oblong, 1.25 times as long as wide, anther collars broadly cylindrical; style base enlarged, smooth to papillose, glabrous, style branches long-clavate, slightly mammillate below, smooth above. Cypselae prismatic, 5–7-ribbed, densely covered with short-stipitate glands, rarely setuliferous; carpodium short-cylindrical; pappus setae uniseriate, ~35, persistent, barbellate.

Distinctive features: Similar to *Condylopodium* but distinguished by the obtuse leaf blade tips; glabrous receptacle; 4–10-flowered capitula; and enlarged, glabrous style bases (vs. acuminate blade tips, puberulous receptacle, 20–25-flowered capitula and style enlarged, pubescent bases in *Condylopodium*).

Distribution: A neotropical genus of four species found in Colombia, Ecuador, and Peru, with only one species (*Crossothamnus killipii* (R.M. King & H. Rob.) R.M. King & H. Rob.) reported as a liana; dense forests; 2,100–2,400 m.

CUATRECASANTHUS H. Robinson, *Revista Acad. Colomb. Ci. Exact.* 17 (65): 209. 1989.

Erect shrubs or trees, rarely scrambling shrubs or vines; stems terete, striate, minutely pilose or tomentulose. Leaves alternate, petiolate; blades elliptical, base narrowly cuneate to attenuate, margins appearing entire, narrowly recurved, apex usually sharply acuminate, discolor, pinnately veined. Synflorescence terminal on leafy stems, rounded corymbiform, branching alternate, with large foliaceous bracts only at lower primary nodes; capitula discoid, homogamous, clustered and sessile in glomerules. Involucre cylindrical; involucre bracts ~16 in 5 gradate series, glabrous, inner bracts easily caducous; receptacle glabrous. Capitula with 1 flower; corolla tubular, outside minutely gland-dotted, basal tube narrow, lobes free not forming a throat, pale lavender; anther purple, apical appendage ovate-oblong, glabrous, basal anther appendage papillose fimbriate; style base enlarged, sweeping hairs obtuse to short-acute. Cypselae prismatic, 10-ribbed, with numerous glandular dots, base with broad annular carpopodium; pappus straw-colored, of ~40 persistent capillary bristles, barbellate, a few outer shorter bristles.

Distinctive features: Scrambling vines or shrubs with alternate leaves; one flowered capitula; corolla with free lobes not forming a throat; and 10-ribbed cypselae.

Distribution: A northcentral Andean (Ecuador and Peru) genus of six species with only *C. giannasii* (Stutts) H. Rob. & V.A. Funk from Ecuador (Morona-Santiago and Loja) reported as a scrambling shrub; 2,300–3,200 m.

CYATHOMONE S.F. Blake, J. Wash. Acad. Sci. 13: 105. 1923.

Climbing shrubs (scrambling?). Leaves opposite, compound, petiolate; blades ternate, biternate or pinnate-ternate. Synflorescence corymbiform, of 7–15 capitula, long pedunculate (~10 cm long), nodding; capitula discoid, homogamous (?). Involucre campanulate; involucre

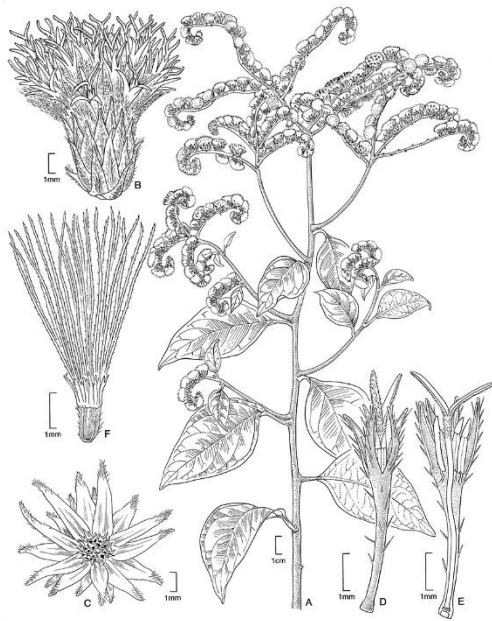
bracts 10, in 2 series, outermost ~5, herbaceous, innermost longer and membranaceous; receptacle convex, paleaceous, the paleas flat, membranaceous. Capitula with flower number unknown. Cypselae transversely compressed, obovate in outline, contracted at apex, black with two broad, ciliolate, somewhat pectinate-lobate wings, erose and fused to 2-awned pappus corona; pappus of two very fragile retrorsely hispid awns and a turbinate, spinulose-ciliolate, persistent corona ~1 mm high.

Distinctive features: Climbing shrub with compound leaves; long pedunculate (~10 cm), nodding capitula; and cypselae with two broad ciliolate wings, erose and fused to a coroniform pappus of two awns.

Distribution: A genus of a single species, *C. sodiroi* (Hieron.) S.F. Blake; known from a single collection from a forest along Pilatón River in Ecuador; ~1,500 m.

CYRTOCYMURA H. Robinson, Proc. Biol. Soc. Washington 100: 849. 1987.

Herbs or shrubs perennial; hairs simple. Leaves alternate, petiolate; blade simple, pinnate veined. Synflorescence scorpioid-cymose with crowded sessile capitula, sometimes disposed in 2 series (subduplicate), caducous with age; capitula discoid, homogamous. Involucre campanulate; involucre bracts 20–30, subimbricate, in 3–5 series; receptacle flat to convex, fimbriate. Capitula with 14–30 flowers, bisexual; corolla tubular, lobes sericeous; anther bases rounded; style base enlarged, sweeping hairs broadly acicular. Cypselae 10-ribbed, sericeous or strigose; carpodium usually annular, symmetrical; pappus biseriate, outer squamellae persistent, inner bristle-barbellate, caducous and white.



Cyrtocymura scorpioides, drawing by A. Tangerini.

Distinctive features: Synflorescence densely scorpioid-cymose with crowded sessile capitula, mostly arranged in two series; involucre bracts usually with curved apices; older capitula caducous leaving only the subtending bracteoles and anthers without sclerified tails.

Distribution: A genus of six species from Mexico to southern Brazil and Argentina, also in Hispaniola in the Antilles. *Cyrtocymura scorpioides* (Lam.) H. Rob. a widely distributed species in the Neotropics, is the

only species in the genus that sometimes grows as a scrambling or leaning shrub; forests, scrubs, disturbed vegetation; 0–1,900 m.

DASYPHYLLUM Kunth in Humboldt, Bonpland & Kunth, Nova Gen. Sp. 4: ed. qu., 17. 1818.

Monoecious or gynodioecious shrubs, trees, or sometimes scrambling or twining woody



Dasyphyllum sprengeianum, photo by N. Roque.

vines > 10 m long; stems cylindrical, often with axillary spines (single, double or fasciculate), straight (Figure 47D) or curved (Figure 47C), persistent or caducous; cross section regular with large medulla (Figure 45A). Leaves alternate, fasciculate or whorled, sessile or petiolate; blades

ovate, elliptic to obovate, apex spiny (mucronate, apiculate or aristate), margins entire, venation acrodromous basal or suprabasal. Synflorescence glomeriform, racemiform or solitary heads; capitula discoid, homogamous, sessile or pedunculate. Involucre campanulate, turbinate or cylindrical, involucre bracts 6–14-seriate, imbricate, apex mucronate, apiculate or aristate; receptacle flat, pilose, sometimes with paleas. Capitula with 6–90 flowers, white to yellowish, isomorphic, hermaphrodite or pistillate; corollas tubular, sometimes pseudo-bilabiate, rarely bilabiate, subligulate or ligulate, pilose, rarely glabrous; stamens inserted on the throat or near base of corolla tube, anthers sagittate, apical connective appendage emarginate or bilobed; style bifid, papillose, glabrous (rarely hairy). Cypselae turbinate or cylindrical, sericeous; pappus plumose, 1-seriate, persistent, whitish or stramineous.

Distinctive features: Scrambling lianas, often with straight or curved axillary spines in pairs or fasciculate; alternate simple leaves, with acrodromous venation; pilose receptacle; discoid heads with many types of corollas; anthers with apical appendages that are either bifid or entire; and plumose pappus.

Distribution: A neotropical genus of 33 species distributed from Venezuela to northwestern Argentina but absent in the Amazon region. Only six species reported as climbers; in Chaco and Cerrado vegetation, dry and seasonal forests; 120–1,500 m.

DRESSLERTHAMNUS H. Robinson, *Phytologia* 40: 494. 1978.

Scrambling (?) vines or lianas; stems slender, terete, sometimes striate, covered by stalked, pseudo stellate hairs. Leaves simple, alternate, petiolate; blades coriaceous to somewhat fleshy, broadly ovate to oblong, broadly rounded at apex, with or without an apiculum, with entire margins, covered by stalked, pseudo stellate hairs, pinnatinerved. Synflorescence terminal,



Dresslerothamnus angustiradiatus,
drawing by A. Tangerini

capituliform; capitula radiate or disciform, heterogamous. Involucre cylindrical, calyculate; involucre bracts uniseriate, 5–8(–11), free, acute at apex; calyculus of few bracts; receptacles flat, setiferous or not. Ray flowers 5–8, pistillate, corolla glabrous, limb filiform, exerted but down curved, rarely with staminodia, visible surface reddish, perhaps obscured adaxial surface yellow, margins involute. Marginal flowers 0 or 5–6, pistillate; corolla tubular-filiform, yellow. Disc flowers 5–19, bisexual, corolla tubular, yellow; filaments collars balustriform or indistinctly so, apical anther appendage narrowly

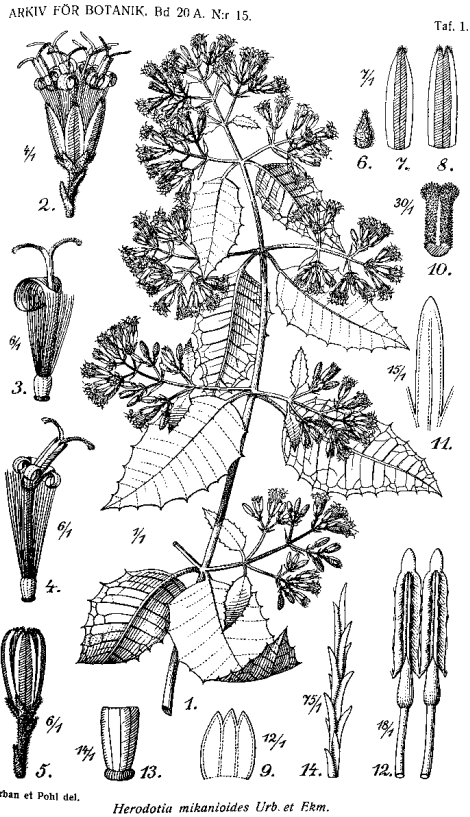
triangular, basal anther caudate; style branches truncate to triangular at apex with sweeping trichomes. Cypselae cylindrical, 8–10-costate, glabrous; pappus of numerous, caducous, capillary, scabridulous bristles, slightly to strongly enlarged at apex.

Distinctive features: Long, scrambling (?) vines with pubescence of stalked, pseudo stellate hairs; caudate anther bases; filiform limb of ray flowers (when present); reddish or yellow corolla; and 8–10-ribbed cypselae.

Distribution: A neotropical genus of five species found in Costa Rica, Panama, and Colombia; growing high into the canopy of lowland moist forests or dwarf cloud forests; (40–) 300–1,600 (–2,160) m.

EKMANIOPAPPUS Borhidi, Acta Bot. Hung. 37: 109. 1992.

Scrambling shrubs; stems slender, angular, sulcate, tomentulose when young. Leaves



Ekmaniopappus mikanioides, from Arkiv för Botanik 20A

opposite, petiolate; blades simple, ovate, cuneate or obtuse at base, serrate to dentate margins, pinnatinerved, abaxially arachno-tomentose.

Synflorescence terminal or axillary, paniculiform; capitula radiate, heterogamous. Involucre cylindrical, calyculate; involucral bracts uniseriate, 5–7, free, erect, imbricate, obtuse or retuse at apex; calyculus of 3–4 uniseriate small bracts; receptacle naked. Ray flowers 2–3, pistillate, corolla liguliform, yellow. Disc flowers 2–3, bisexual, corolla tubular, distally widened, with 5 oblong, revolute lobes, much shorter than the tube and 1-nerved; stamens inserted above the middle of the tube, anthers sagittate or auriculate at the base, with

an apical oblong appendage; style branches linear, apically truncate, and shortly penicillate.

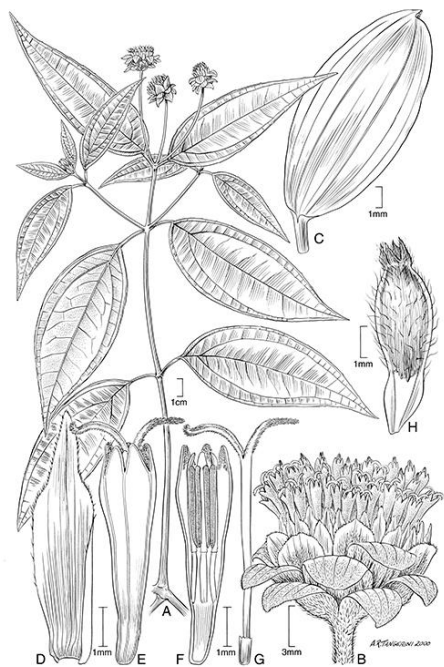
Cypselsae clavate, 8-ribbed, minutely verrucose between the costa; pappus of numerous, caducous, uniseriate, filiform, minutely denticulate bristles.

Distinctive features: Scrambling subshrubs; leaves arachno-tomentose beneath with serrate margins; and capitula calyculate, few-flowered.

Distribution: A genus endemic to Dominican Republic, with two species, of which only *E. mikanioides* (Urb. & Ekman) Borhidi is a climber; thickets on limestone substrate, roadsides and disturbed areas on hillsides, covered with broad-leaved forest; 1,200–2,400 m.

ELAPHANDRA Strother, Syst. Bot. Monogr. 33: 17. 1991.

Perennial herbs or shrubs, sometimes scrambling shrubs or lianas. Leaves opposite,



Elaphandra lehmannii, drawing by A. Tangerini.

petiolate; blades triplinerved. Synflorescence dichasiate or openly paniculiform; capitula radiate, heterogamous, rarely discoid. Involucres hemispherical; involucre bracts in 2–3 series, subequal to gradate; receptacles flat to convex, paleaceous. Ray flowers sterile (lacking styles), corollas liguliform, yellow to yellow-orange. Disc flowers bisexual, corollas tubular, yellow or blackish green with yellow lobes, with fibers embedding vascular strands; anthers black, apical anther appendages ovate, rarely with glandular trichomes; style branches tapered, apices papillose.

Cypselae compressed, shallowly quadrate, sometimes base narrowed or stipitate and then cypselae narrowly

obpyriform, dark brown to black or reddish brown, glabrescent to moderately pubescent; pappus absent or a bicorniculate, minute crown.

Distinctive features: Scrambling vines or shrubs with eglandular leaves; ray flowers (when present) neuter; apical anther appendages ovate eglandular; rostrate (necked) cypselae that have a reduced or aristate pappus; and the lack of carpodium and elaiosomes.

Distribution: A neotropical genus of 14 species occurring in Panama, Caribbean and tropical Andes of South America. *Elaphandra moriana* Pruski from French Guiana, *E. lehmannii* (Hieron.) Pruski from Colombia, *E. paucipunctata* H. Rob. & *E. quinquenervis* (S. F. Blake) H.

Rob. from Ecuador are reported as climbers; evergreen low, or montane wet forests; 500–2,700 m.

ELECTRANTHERA Mesfin, D.J. Crawford & Pruski, *Phytoneuron* 68: 4. 2015.

Erect or scrambling shrubs or subshrubs; stems cylindrical. Leaves opposite, sessile to



Electranchera mutica, photo by P. Acevedo.

petiolate; blades simple to trifurcate, commonly serrate to dentate, glabrous to slightly pubescent, rarely villous or hirsute, pinnately veined.

Synflorescence capituliform, corymbiform or a solitary terminal capitulum; capitula radiate,

heterogamous. Involucre campanulate; involucre bracts 2-seriate, dimorphic,

outer 4–6, green, inner bracts ~8, usually longer than the outer ones, chartaceous with scarious margins, yellowish with dark striations; receptacle flat, paleaceous; palea flat, sparsely striate, with paired resin ducts, caducous. Ray flowers pistillate, corolla liguliform, corolla tube short, papillose to pilose, yellow. Disc flowers bisexual, corolla tubular, corolla tube papillose to pilose, yellow; anthers dark brown to black, filaments glabrous, collar longer than basal auricles; style branches flattened, short cuspidate-subulate or caudate, nectary tubular or narrowly cylindrical. Cypselae strongly transversely compressed, flat to somewhat incurved, erostrate, monomorphic to slightly heteromorphic, all cypselae narrowly margined, thinly or narrowly winged, glabrous, brown to grayish black at maturity, few–several costate but otherwise smooth,

never tuberculate; all cypselae epappose or very infrequently with a pair of small slender awns.

Distinctive features: Scrambling shrubs with simple, opposite serrate leaves; corolla tube papillose to pilose; and cypselae strongly flattened, glabrous, transversely compressed and non-carbonized.

Distribution: A genus of three species centered in the highlands of Mexico, of which *E. mutica* (DC.) Mesfin et al. has been described as a scandent shrub 2–3 m long; Mexico, Guatemala, Honduras, and El Salvador; montane forests, oak or pine-oak forests, thickets, dry hillsides, roadside banks, wooded slopes and along streams; 800–2,400 m.

ELEKMANIA B. Nordenstam, *Compositae Newslett.* 44: 66. 2006.

Erect shrubs or subshrubs, sometimes scrambling (e.g., *E. buchii* (Urb.) B. Nord.) or twining vines (e.g., *E. haitiensis* (Krug & Urb.) B. Nord.) that can reach 2–5 m in length. Stems,



leaf abaxial surface, inflorescence axes and involucre bracts densely covered by beige or whitish, wooly hairs (floccose). Leaves alternate, shortly petiolate; blade simple, adaxially glabrous, pinnately veined, with dentate or denticulate margins.

Synflorescence distal, corymbose or cymose; capitula radiate (e.g., *E. buchii*) or discoid and monogamous (e.g., *E. haitiensis*).

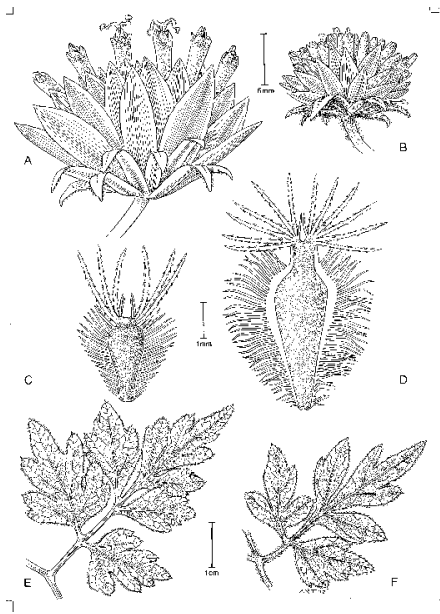
Involucre cylindrical or campanulate; involucre bracts uniseriate or subbiseriate, coriaceous, oblong, persistent; receptacle flat, epaleaceous. Ray flowers pistillate; disc flowers bisexual,

corolla tubular, white or yellow; anthers yellow to brown, sagittate or shortly caudate, apical appendage lanceolate; style branches yellow, flattened, truncate or somewhat obtuse with short sweeping hairs. Cypselae glabrous or hirsute, 8–10-ribbed with distinct carpodium. Pappus bristles numerous, slender.

Distinctive features: Slender scrambling or twining vines; stems, inflorescence axes, involucre bracts, and underside of leaves albo-floccose; leaves simple, alternate, discolored with denticulate margins.

Distribution: A genus ~10 species endemic to Hispaniola (Dominican Republic and Haiti), with only two species sometimes growing as scrambling or twining vines; on limestone outcrops; 200–1,700 m.

ERICENTRODEA S.F. Blake & Sherff, J. Wash. Acad. Sci. 13: 104. 1923.



Weak-stemmed shrubs or scrambling vines. Leaves opposite, some species with prehensile petioles; blades compound, pinnate to bipinnate, 3–4-ternate, segments linear to lanceolate. Synflorescence corymbiform; capitula terminal, discoid, homogamous, rarely radiate (in *E. corazonensis* S.F. Blake & Sherff). Involucre campanulate to hemispheric; involucre bracts in 2–4 series, dimorphic, outermost 2 series reflexed, green, herbaceous, innermost series erect, membranaceous; receptacle convex, paleaceous. Ray flowers, when present,

pistillate, corolla liguliform, yellow. Disc flowers bisexual, corolla tubular, throat broad and

Ericentrodea davidsmithii, drawing by A. Tangerini.

abruptly narrowed into the tube, yellow or white; apical

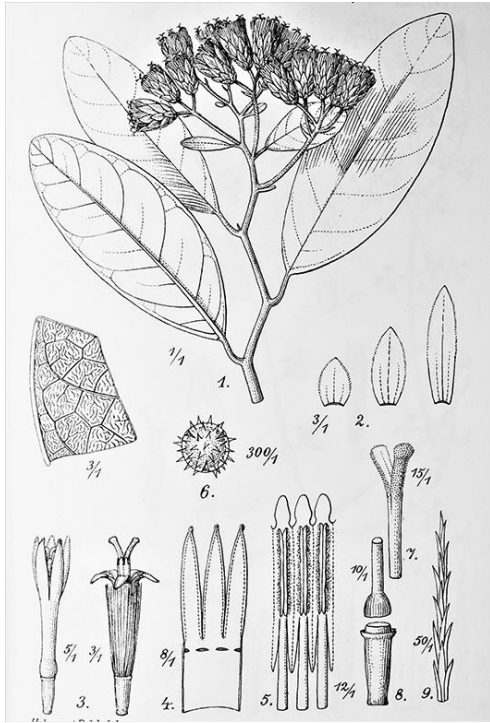
anther appendage ovate, with cordate-sagittate bases, glabrous; style branches deltate, with stigmatic papillae. Cypselae strongly transversely compressed, distinctly or obsoletely 2-winged, coarsely ciliate on the lobed margin, contracted at apex into a short neck or collar; pappus awns 6–15, retrorsely barbed, fragile, in groups of 3–8 on the corners of the cypselae, those of each group usually more or less connate at base, sometimes with 2 or 3 shorter present on each side of the cypselae.

Distinctive features: Scrambling vines, with opposite, compound leaves; cypselae strongly transversely compressed with contracted apices, 6–15 retrorsely barbed pappus awns, mostly along the angles, and a marginal ring bearing a dense fringe of spreading setae.

Distribution: A South American genus of six species found in Colombia, Ecuador, Peru and Bolivia; sub-Andean woods; 1,800–3,000 m.

FEDDEA Urban, Repert. Spec. Nov. Regni Veg. 21: 73. 1925.

Scrambling shrubs; stems slender, striate, glabrous, angular but becoming cylindrical



Feddea cubensis, from Repert. Spec.
Nov. Regni Veg. 21: tab. 16.

with age. Leaves alternate, petiolate; blades simple, coriaceous, obtuse at base, mucronate at apex, with entire margins, glabrous, pinnatinerved. Synflorescence arranged in terminal corymbiform cymes; capitula discoid, homogamous with few flowers. Involucre campanulate, ecalyculate; involucral bracts multiseriate, numerous, gradually smaller toward the base, erect, imbricate, obtuse at apex; receptacle nearly flat, epaleaceous. Capitula with 9–12 flowers, bisexual, corolla tubular; anthers with an apical, truncate appendage, sagittate at base; stigmatic branches linear, slightly wider at the apex, abaxially papillate. Cypselae

smooth or slightly striate, rough at the base; pappus of numerous uniseriate, free, filiform ciliolate bristles.

Distinctive features: Scrambling subshrubs; stems cylindrical, striate; leaves alternate, simple, pinnatinerved, entire at margins, glabrous; capitula ecalyculate, involucre campanulate, with many gradate bracts.

Distribution: A genus of a single species (*F. cubensis* Urb.) endemic to eastern Cuba; pinelands; 0–40 m.

GONGROSTYLUS R.M. King & H. Robinson, Phytologia 24: 387. 1972.

Scrambling, slender vines; sparingly branched. Leaves opposite, short-petiolate; blades



Gongrostylus costaricensis, photo by B. Hammel.

remotely serrate,
veins triplinerved
from near the base.
Synflorescence
mostly axillary,
corymbiform with
cymose branches;
capitula discoid,
homogamous.

Involucral bracts

~25, subimbricate, ~3-seriate, persistent; receptacle slightly convex, glabrous. Capitula with ~20 flowers; corolla tubular, mostly glabrous with glands on outer surface of lobes, white; apical anther appendages short, only half as long as wide, anther collar elongate; style base densely hirsute, style branches narrow and slightly mammillate below, greatly enlarged into a smooth fusiform tip. Cypselae prismatic, 5-ribbed, glabrous; carpodium a distinct short cylinder with prominent upper rim; pappus setae uniseriate, ~30, barbellate, persistent, slightly narrowed towards the tips.

Distinctive features: Scrambling vines with opposite, triplinerved leaves; anther appendages half as long as wide; style base densely hirsute and tips of style branches with abrupt (fusiform) enlargement.

Distribution: A genus of two species, *G. costaricensis* (Kuntze) R.M. King & H. Rob., and *G. pipolyi* H. Rob.; moist forests along the Caribbean slopes of Costa Rica and Panama and along the Pacific slope in Colombia and Ecuador; 450–1,000 m.

GUAYANIA R.M. King & H. Robinson, *Phytologia* 21: 302. 1971.

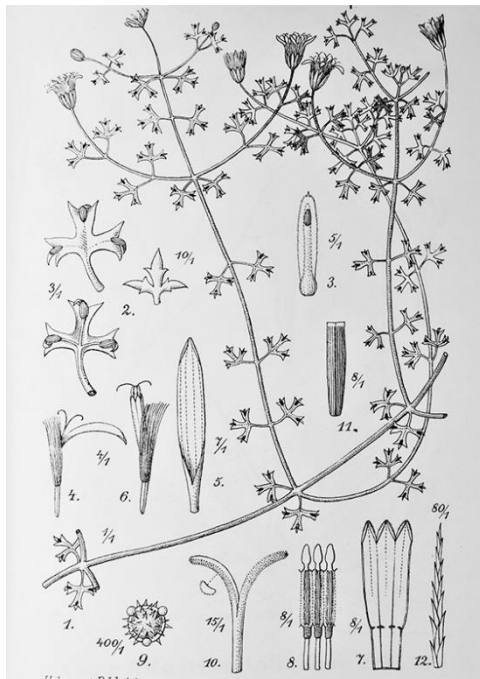
Erect perennial herbs or shrubs, sometimes scrambling shrubs; stems terete, striate. Leaves opposite, petiolate; blades pinnately veined. Synflorescence strongly cymose; ultimate branchlets with sessile or subsessile capitula in clusters; capitula discoid, homogamous. Involucre campanulate; involucre bracts 12–25, subimbricate, 3–4 unequal gradated series, rather persistent, mostly 4-costate on outer surface; receptacle convex to conical, glabrous. Capitula with 5–25 flowers; corolla tubular, bluish white, lavender, or white, corolla lobes triangular, about as long as wide, outer surface densely hairy; apical anther appendage large, triangular, longer than wide, anther collars slender; style base not enlarged, glabrous, style branches with distinct short papillae. Cypselae prismatic, 5-ribbed, 1.5–2 mm long, glabrous or with few setae mostly on ribs; carpodium distinct, strongly asymmetrical; pappus of 30–40 bristles, uniseriate.

Distinctive features: Distinguished by a set of features such as few flowers per capitula (5–25 flowers); receptacle convex to conical, glabrous; corolla lobes densely hairy; style base not enlarged, glabrous; style branches with distinct short papillae; and carpodium asymmetrical.

Distribution: A genus of six species chiefly distributed in the Guayana Highlands of Venezuela, with only one species, *G. penninervata* (Wurdack) R.M. King & H. Rob. which in addition to being erect, grows as a scrambling shrub; mixed montane forest; ~1,000 m.

HARNACKIA Urban, Repert. Spec. Nov. Regni Veg. 21: 72. 1925.

Twining vines; stems glabrous, slender, angular, sulcate, becoming cylindrical with age.



Harnackia bisecta, from Repert. Spec. Nov. Regni Veg. 21: tab. 15.

Leaves opposite, long-petiolate; blades < 1 cm long, deeply trilobed, each lobe distally trilobed-spinulose, glabrous, aromatic. Capitula solitary, long pedunculate, at the end of axillary branches; capitula radiate, heterogamous or discoid, homogamous. Involucre campanulate, ecalyculate; involucre bracts 8, uniseriate, free, erect, imbricate, oblong, with chartaceous margins obtuse, becoming reflexed with age; receptacle flat, naked. Ray flowers 5, pistillate; corolla liguliform. Disc flowers 10, bisexual, tubular; anthers slightly exserted, truncate at the base; style branches linear, papillate, with

no appendage at apex. Cypselae clavate, striate; pappus of numerous, uniseriate, filiform, ciliolate bristles.

Distinctive features: Twining vines; stems sulcate, angular; leaves opposite, bi-trilobed-spinulose, glabrous, and aromatic; capitula radiate, ecalyculate; and involucre campanulate.

Distribution: A genus of a single species (*H. bisecta* Urb.) endemic to Sierra de Nipe in eastern Cuba; pinelands and dry scrubs (*charrascales*); ~800 m.

HEBECLINIUM de Candolle, Prodr. 5: 136. 1836.

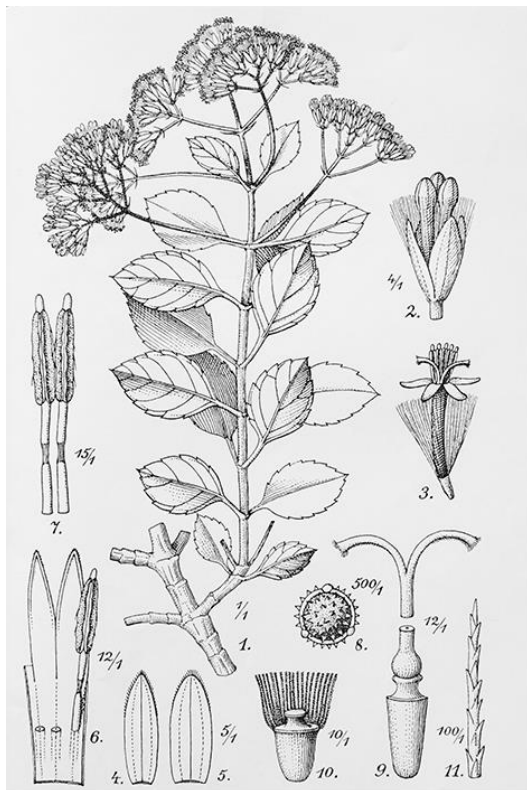
Large herbs or subshrubs, erect or rarely scrambling and reaching 3–4 m in length; stems terete, slightly striated. Leaves opposite, usually long petiolate; blades usually crenate or serrate, pinnate or triplinerved from or near the base, glandular along lower surface. Synflorescence lax, paniculiform with short pedicels; capitula discoid, homogamous. Involucre broadly campanulate; involucre bracts 25–40, subimbricate, in 3–5 strongly unequal gradated series, inner bracts caducous; receptacle hemispherical, glabrous to densely pubescent. Capitula with 20–80 flowers; corolla tubular, white or pink, outer surface glabrous below, inner surface of throat with numerous hairs in some species, lobes triangular, longer than wide, usually with prominent multicellular uniseriate hairs and few glands on outer surface; apical anther appendage large, slightly longer than wide, anther collar usually slender; style base not enlarged, glabrous, style branches narrowly filiform, terete, mammillate. Cypselae prismatic, often slightly curved, narrowed below, 4–5-ribbed, setae sometimes present; carpodium scarcely distinct; pappus of 30–40 scabrid bristles in one series.

Distinctive features: Scrambling vines with simple, opposite, serrate, pinnatinerved leaves; synflorescence lax, paniculiform, receptacle usually pubescent and style branches filiform and terete at least for most of their length.

Distribution: A neotropical genus of 28 species distributed from Mexico to Paraguay, with highest diversity in Colombia, Ecuador, and Peru. Two species, in addition to being erect shrubs, sometimes grow as climbers, i.e., *H. beneolens* (B.L. Rob.) R.M. King & H. Rob. from Ecuador and *H. bullatissimum* (B.L. Rob.) R.M. King & H. Rob. from Ecuador and Peru; premontane or montane wet forests; 300–2,400 m.

HERODOTIA Urban & Ekman, Ark. Bot. 20A, 5: 63. 1926.

Scrambling shrubs; stems slender, quadrangular, glabrous. Leaves opposite, petiolate;



Herodotia haitiensis, from Arkiv för Botanik 20A(5), Tab. 3.

blades elliptic to ovate, cuneate at base, with sinuate-lobulate margins, pinnatinerved. Synflorescence terminal, subcorymbose; capitula discoid, homogamous. Involucre cylindrical, ecalyculate; involucre bracts 4, biseriate, free, erect, imbricate; receptacle, flat, naked. Capitula with 2–3 flowers, bisexual, yellow; corollas tubular, lobes lanceolate-linear about $\frac{1}{2}$ as long as the tube; apical anther appendage short, oblong, the anther base obtuse, ecaudate; stigmatic branches linear, recurvate, abaxially papillate, truncate and shortly penicillate at apex. Cypselae clavate, 8-ribbed, glabrous; pappus with numerous, biseriate, free, white, filiform,

minutely denticulate bristles.

Distinctive features: Scrambling subshrubs; stems square, slender; leaves opposite, simple, pinnatinerved, dentate; and involucre of 4, long, imbricate bracts.

Distribution: A genus endemic to Hispaniola with a single species, *H. haitiensis* Urb. & Ekman distributed in the pinelands of Constanza (Dominican Republic) and the Massif de la Selle (Haiti); 1,500–2,500 m.

HETEROCONDYLUS R.M. King & H. Robinson, *Phytologia* 24: 389. 1972.

Erect shrubs or less often subwoody scrambling vines. Stems slender, terete, striate, 4–5



Heterocondylus vitalbae, photo by P. Acevedo.

m long, pubescence glanduliferous or not. Leaves opposite, petiolate; blades obtuse or rounded at base, with dentate margins, pinnate to 3–5-plinerved. Synflorescence terminal or axillar, thyrsoide-paniculiform; capitula discoid, homogamous. Involucre cylindrical; involucre bracts 15–30, in 3–5 gradate series, erect, persistent, pinkish; receptacle, flat, glabrous. Capitula 20–80-flowered, bisexual, corolla tubular, white to pink or reddish purple, shortly 5-lobed, lobes triangular, usually distinctly longer than wide, smooth on both surfaces, glabrous to sparsely glanduliferous on outer surface; anthers included, apical

anther appendage short, slightly longer than wide, anthers obtuse at the base; style enlarged at the base often with hairs; style branches linear to broadly linear, smooth to short-mammillate,

lilac or pink. Cypsela prismatic to fusiform, 5-ribbed, shortly setulose or glandular; carpopodium distinct asymmetrical; pappus with 20–30 scabrid, uniseriate, persistent, bristles.

Distinctive features: Scrambling, slender vines, 4–5 m long; stems cylindrical, striate; leaves opposite, dentate, 3–5-plinerved; involucre of 15–30 pinkish bracts in 3–5 series; style enlarged at the base often with hairs and carpopodium asymmetric.

Distribution: A neotropical genus of 14 species of which only *H. vitalbae* (DC.) R.M. King & H. Rob. in addition to being an erect shrub also grows as a scrambling shrub or vine; Honduras south to S–SE Brazil; often in moist, disturbed areas such as forest margins and roadsides; 0–1,800 m.

HIDALGOA La Llave in La Llave & Lexarza, Nov. Veg. Descr. 1: 15. 1824.

Vines or lianas, ≥ 10 m long, with prehensile petioles (Figure 48A), sometime weakly



Hidalgoa ternata, photo by P. Acevedo.

twining. Leaves opposite; petioles long; blades trifoliolate or 5-palmately compound, serrate at margins, pinnately veined or subtriplinerved. Synflorescence simple, cymose or solitary on long peduncles, terminal or axillary; capitula radiate, heterogamous. Involucre campanulate; involucreal bracts dimorphic, outer fleshy,

herbaceous, spreading, inner membranaceous; receptacles flat, paleaceous. Ray flowers pistillate, corolla liguliform, bright yellow to orange or red. Disc flowers functionally staminate, corolla tubular, yellow to orange; apical anther appendage acute, brown, glabrous, sometimes with a

gland, without resin canals; style branches (ray flowers) slender, subulate, spreading. Cypselae transversely compressed, biconvex, fusiform, brown to black; pappus absent, wings projecting as thickened, lacerate awns above neck.

Distinctive features: Weakly twining vines with prehensile petioles; leaves trifoliolate or 5-palmately compound; corolla of ray flowers with minute and inconspicuous bilobed or trilobed apices; and cypselae broadly oval, flattened and epappose.

Distribution: A neotropical genus of three species mainly from Mexico, parts of Central America, and NW South America (Venezuela to Peru); in gallery forests, montane forests and secondary vegetation; 180–1,800 m.

HUGHESIA R.M. King & H. Robinson, *Phytologia* 47: 252. 1980.

Liana 6–7 m long (climbing mechanism not known to us); stems terete, glabrous, partly reddish brown. Leaves opposite, decussate, petioles ~1 cm long; blades ovate, base broadly rounded, margins subentire, remotely and minutely serrulate, triplinerved, glabrous and non-glandular, with ducts along the larger veins. Synflorescence distinctly thyrsoid-paniculiform; capitula discoid, homogamous, sessile or subsessile in small clusters at ends of branchlets. Involucre broadly campanulate; involucre bracts ~18, subimbricate, in ~4 unequal gradated series, tips rounded, outer surface glabrous, inner bracts easily caducous; receptacle convex or hemispherical, glabrous. Capitula with ~9 flowers, corolla tubular, glabrous on inner and outer surfaces, white, dried appearing as purple in distal half; lobes triangular, about as long as wide, smooth on both surfaces; apical anther appendages large, 1.5 times as long as wide, anther collars cylindrical; style base not enlarged, glabrous, style branches linear, densely mammillate or short-papillose. Cypselae prismatic, 5-ribbed, shortly setulose above, glabrous below;

carpopodium distinct, short-cylindrical, slightly procurent on ribs; pappus of ~30 scabrid, persistent and unequal bristles in one series.

Distinctive features: Lianas; stems glabrous, reddish brown; blades ovate, base broadly rounded, ducts along the larger veins, triplinerved; synflorescence thyrsoid; capitula with ~9 flowers, inner involucre bract caducous, receptacle strongly convex; corolla glabrous; and slender pappus bristles.

Distribution: A genus of a single species, *H. reginae* R.M. King & H. Rob.; secondary forests, Peru; ~1,600 m.

HYMENOSTEPHIUM Benth, Gen. Pl. 2: 382. 1873.

Erect annual or perennial herbs, sometimes scrambling vines to 4 m long; stem



Hymenostephium cordatum, photo by P. Acevedo.

cylindrical, weak, striate, and scabrous. Leaves opposite, petiolate; blades ovate, elliptic to lanceolate, variously serrate, triplinerved from base.

Synflorescence mostly open, paniculiform, or less often, capitula solitary; capitula radiate,

heterogamous or discoid,

homogamous. Involucre campanulate, rarely cylindrical; involucre bracts in 2–3 series, subequal; receptacles flat to shallowly convex, paleaceous. Ray flowers 5–21, neuter, sterile, rarely absent, corolla liguliform, pale yellow to golden yellow or orange. Disc flowers 10–

numerous, bisexual, corolla tubular, yellow; anthers black, or dark brown. Cypselae biconvex, black or brown, glabrous to densely pubescent, sometimes with a prominent elaiosome; pappus of 2-awned scales, and 2–4 short scales between them, or pappus absent.

Distinctive features: Scrambling shrubs or subshrubs, scabrous to the touch, with opposite, simple, serrate, triplinerved leaves, the blades membranaceous, ovate to lanceolate, apex acuminate, base rounded to truncate; and lanceolate involucre bracts with acute apex, pubescent on abaxial surface.

Distribution: Approximately 26 species from Mexico to Argentina, *H. cordatum* (Hook. & Arn.) S.F. Blake the only species in the genus that sometimes grows as a climber; deciduous and evergreen montane forests, sometimes in open disturbed areas; 600–2,100 m.

ICHTHYOTHERE Martius, Repert. Pharm. 35: 195. 1830.

Erect perennial herbs or shrubs, rarely scrambling vines, often with a xylopodium at base.



Ichthyothere sp., photo by D. Sakai.

Leaves opposite, petiolate or sessile; blades membranaceous to semi-succulent, lanceolate to ovate, glabrous or pubescent, triplinerved. Synflorescence terminal, paniculiform; capitula disciform, heterogamous. Involucre globose to hemispheric; involucre bracts in 1(–2) series, subcoriaceous, striate, white or pinkish white, wrapping around cypselae;

receptacles convex to conic, paleaceous. Marginal flowers pistillate, corolla tubular, white or yellow white, bent or incurved. Disc flowers functionally staminate, corolla tubular white or

white-yellow, nectaries well-developed; apical anther appendages ovate to oval, cucullate with large glandular trichomes, trichomes extending down the connective; style branches (of the ray flowers) reflexed and curled, margins involute, stigmatic area in 2 marginal bands, papillose, eglandular. Cypselae shallowly transversely compressed, oblong, very broadly convex, black, essentially glabrous, epappose.

Distinctive features: Scrambling vines with opposite, simple, denticulate, subtriplinerved leaves; dichasiate synflorescences; globose or hemispherical paleaceous capitula, with white (rarely overspread with pink) striate phyllaries (the broader outer ones enclosing the cypselae), and epappose broadly convex cypselae.

Distribution: A genus of ~27 species from Panama and South America, *I. scandens* S.F. Blake being the only species that grows both as an erect shrub and a scrambling vine; Nicaragua south to Peru, including Venezuela; 400–2,250 m.

JUNGIA Linnaeus f., Suppl. 58, 390. 1782 (nom. & orth. cons.).

Erect or scrambling shrubs; stems often tomentose, sometimes fistulose. Leaves simple,



Jungia ferruginea, photo by RoCL

alternate, mostly petiolate; blades ovate to suborbicular (rarely oblong), acute to obtuse at apex, with subentire to irregularly lobed margins, palmately 3–5-veined (rarely pinnately veined), and usually abaxially tomentose surface. Synflorescence terminal or axillary, corymbiform or paniculiform; capitula bilabiate, homogamous. Involucre cylindrical to

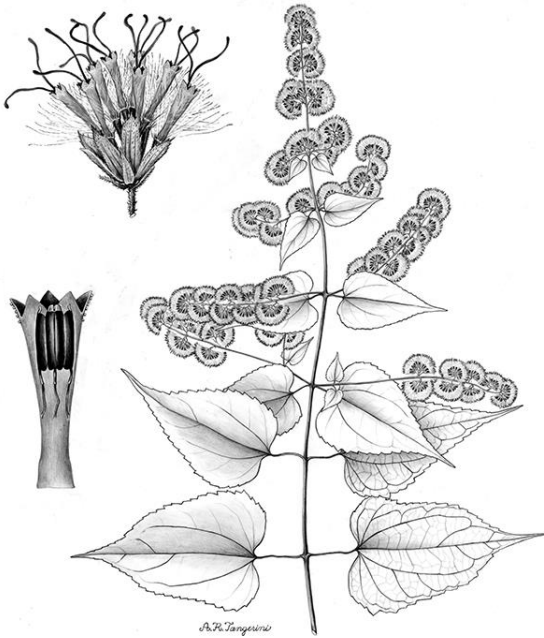
campanulate; involucre bracts mostly 6–12, 1–2-seriate, subequal, acute to obtuse at apex; receptacles flat, paleaceous, glabrous or short-setulose. Capitula with 6–130 flowers, bisexual; corolla bilabiate, outer lip 3-dentate, inner lip deeply 2-lobed, white, sometimes yellow or pinkish; apical anther appendages elongate, mostly oblong, usually acute, anther bases sagittate; style branches truncate at apex, with a crown of sweeping hairs. Cypselas cylindrical to fusiform, often subrostrate or rostrate, and 4–5-costate, glabrous or pubescent; pappus 1–few-seriate, composed of many subequal, plumose to less commonly barbellate, capillary bristles.

Distinctive features: Scrambling vines with palmately 3–5-veined leaves; capitula bilabiate, receptacle paleaceous and style branches truncate and penicillate.

Distribution: A neotropical genus of ~29 species distributed from Mexico to northern Argentina, with 13 species reported as climbers; mainly in montane forests, paramo and subparamo habitats; 1,500–4,500 m.

KOANOPHYLLON Arruda in Koster, *Travels Brazil* 495. 1816.

Erect shrubs, small trees, or less frequently scrambling shrubs or vines. Stems more or less branched, cylindrical. Leaves opposite, rarely alternate, petiolate; blades usually lobed, with entire or serrate margins, with pinnate or triplinerved venation. Synflorescence paniculiform or corymbiform; capitula discoid, homogamous. Involucre narrowly campanulate; involucre bracts 7–16 unequal, usually weakly subimbricate in 2–4 unequal to subequal series, mostly spreading



Koanophyllon solidaginoides, drawing by A. Tangerini.

at maturity, inner bracts sometimes caducous; receptacle flat to convex, glabrous. Capitula 5–20-flowered, bisexual; corolla tubular, white, cream or greenish, corolla lobes glandular-pubescent on the outer surface; apical anther appendage wider than long; style base not enlarged, glabrous, style branches usually distinctly broadened and becoming smooth apically, without glands. Cypselae prismatic, 5-ribbed, carpopodium annular; pappus of 30–35, uniseriate bristles.

Distinctive features: Scrambling shrubs with opposite leaves; involucre weakly subimbricate in 2–4 series; corolla lobes glandular-pubescent on the outer surface; and pappus of uniseriate bristles.

Distribution: A neotropical genus of ~114 species distributed from Mexico to northern Argentina. Twenty species reported as scrambling shrubs (some of which sometimes grow as erect shrubs), these mostly found in the West Indies, or few species scattered in the Neotropics; dry to moist open areas; 500–2,500 m.

LEONIS B. Nordenstam, *Compositae Newslett.* 44: 55. 2006.

Twining herbaceous or subwoody vines; stems slender, cylindrical, striate, glabrous, reaching 5–6 m in length. Leaves alternate, mostly on short, axillary flowering shoots, petiolate; blades simple, chartaceous, 1.5–5 cm long, ovate to elliptic, entire, shallowly trilobed or 1–4-



Leonis trineura, photo by P. Acevedo.

dentate, triplinerved from near the obtuse or cuneate base.

Synflorescence corymbiform, distal on short, axillary shoots; capitula radiate or disciform, heterogamous.

Involucre campanulate, calyculate; involucre bracts 8–12(–13),

uniseriate, oblong to lanceolate,

apically acute and puberulous, with 3–5 blackish resiniferous veins; calyculus bracts 2–5, shorter than the involucre bracts; receptacle slightly convex; peduncles slender, 2–3 cm long, with a few linear bracts. Ray flowers pistillate, 1–5(–8); corolla liguliform, yellow; style branches linear, glabrous, obtuse. Disc flowers 16–24, bisexual; corolla tubular, yellow, corolla lobes with a median subapical dark resin canal, apically subcucullate; apical anther appendage narrowly ovate-lanceolate, filament collar basally enlarged, anthers sagittate; style with two dark resin canals, style branches linear, obtuse with few lateral sweeping hairs or subglabrous; stylopodium distinct. Cypselae elliptic-oblong, glabrous, with a distinct rib; pappus composed of numerous, pluriseriate, basally connate, minutely barbellate, white bristles.

Distinctive features: Twining herbaceous vines, strongly resiniferous with distinct, often blackish resin ducts on involucre bracts; leaves alternate, simple, triplinerved, chartaceous; capitula with persistent multiseriate involucre bracts and a calyculus; and corollas yellow.

Vegetatively similar to *Mattfeldia triplinervis* Urb. a species endemic to Haiti but distinguished from it by the bilabiate ray flowers and the narrow, few-flowered capitula with only five involucre bracts.

Distribution: A genus of a single species (*L. trineura* (Griseb.) B. Nord.) endemic to Cuba and Hispaniola (Haiti and Dominican Republic); scrubs and pinelands in dry to moist open areas; 400–2,000 m.

LEPIDAPLOA (Cassini) Cassini in F. Cuvier, Dict. Sci. Nat. 36: 20. 1825.

Annual or perennial herbs or subshrubs, erect or less frequently scrambling, sometimes



Lepidaploa borinquensis, photo by P. Acevedo.

reaching > 4 m in length. Stems cylindrical, usually with flexuose branches. Leaves alternate, sessile or petiolate; blades simple. Synflorescence of terminal or axillary uniseriate cymes disposed in flexuose branches; capitula discoid, homogamous, each more or less

sessile, usually subtended by foliaceous bracts that are larger than the capitulum. Involucre campanulate; involucre bracts in 3–6 series, persistent and spreading after fruit dispersal; receptacle flat, glabrous, epaleaceous. Capitula 8–35-flowered, bisexual, light violet or less frequently white; corolla tubular, narrowly campanulate, corolla lobes oblong, as long as the tube, usually pubescent or glandular; style usually hispidulous, style branches elongated, filiform. Cypselae 8–10-ribbed; pappus in 2 series, the inner of bristles and the outer of short, irregular scales.

Distinctive features: Scrambling subshrubs or vines; synflorescence in seriate cymes with flexuose branching; capitula discoid, sessile, with multiseriate triangular involucre bracts; corollas light violet to white; and pappus in two series, the outer series of short scales.

Distribution: A neotropical genus of ~120 species distributed from Mexico to northern Argentina. Twelve species are consistently reported as scrambling shrubs; these are scattered in the Neotropics but mostly from Mexico to northern South America, and the West Indies; diverse habitats, dry to moist forests, scrubs, and open areas; 50–2,800 m.

LESCAILLEA Grisebach, Cat. Pl. Cub. 156. 1866.

Twining vines. Stems angular, slender, glabrous, sulcate, seemingly leafless with



Lescaillea equisetiformis, photo by S. Nova.

numerous, short, opposite, lateral branches. Leaves opposite; blades reduced to scales 1 mm long. Capitula terminal on branches, small, discoid, homogamous, on short peduncle (5–10 mm long). Involucre narrowly campanulate, ~4 mm long; involucre bracts 5–10, uniseriate, subsistent, oblong, glabrous, with an oil gland at the apex; receptacle flat, epaleaceous. Capitula 5–8-flowered, bisexual; corolla tubular yellow; anthers included, ecaudate; style branches elongated, obtuse at the apex, abaxially puberulous. Cypselae terete, striate,

green or brownish, pilose at the apex; pappus of barbellate or minutely pilose bristles, uniseriate.

Distinctive features: Scrambling shrubs, seemingly leafless (leaves reduced to scales), with minute capitula at the end of lateral branches and involucre bracts with an oil gland at the apex.

Distribution: A Cuban endemic genus of a single species (*L. equisetiformis* Griseb.) from Pinar del Río; xeromorphic thickets with *Copernicia* and *Pinus*; ~150 m.

LIABUM Adanson, Fam. Pl. 2: 131. 1763.

Perennial herbs, subshrubs, or shrubs, less frequently climbing shrubs or small trees;



Liabum igniarium, photo by M. Nuñez.

stems terete or scarcely to strongly hexagonal, usually densely white-tomentose. Leaves opposite, petiolate, sometimes inconspicuously petiolate when blade decurrent, wingless or winged; blades ovate to elliptic, sometimes subtriangular or rarely obovate, acute to acuminate at apex, with

mucronate-serrate or serrulate margins, usually densely white-lanate on abaxial surface, triplinerved. Synflorescence terminal, umbelliform or corymbiform; capitula radiate, heterogamous. Involucres usually campanulate; involucre bracts 50–150, 4–8-seriate, acute to acuminate at apex; receptacles with high ridges. Ray flowers 20–150, pistillate; corolla liguliform, yellow or orange. Disc flowers 15–90, bisexual; corolla tubular, yellow; anthers usually yellowish, apical anther appendages ovate to subtriangular, smooth, anther bases short-caudate; style base somewhat broadened, style branches with papillose abaxial surface. Cypselae cylindrical, 8–10-costate, pubescent with twin hairs, usually quadrate crystals; pappus biseriate,

outer series of short scabrous bristles (or absent), inner series of elongate, persistent, capillary bristles.

Distinctive features: Scrambling vines with triplinerved and abaxially densely white-lanate leaves, umbelliform synflorescences, and cypselae covered exclusively by paired hairs.

Distribution: A neotropical genus of 22 species distributed from southeastern Mexico to northwestern Argentina, including the West Indies, mainly in the Andes, but also in western Brazil. Six species reported as climbers; humid premontane forests, montane tropical forests, subtropical forests, and dry transitional forests; up to 4,600 m.

LLERASIA Triana, Ann. Sci. Nat. Bot. ser. 4. 9: 37. 1858.

Shrubs, small trees, scrambling shrubs to 3 m long or lianas; stem cinereo-tomentose,



Llerasia macrocephala, photo by A.F. Fuentes Claros.

reaching up to 12.8 cm in diam. in some species. Leaves alternate, petiolate; blades coriaceous, entire or dentate, pinnately veined, abaxially cinereo-tomentose.

Synflorescences paniculate-corymbiform; capitula discoid, homogamous. Involucre cylindrical; involucre bracts 4–6-seriate, strongly gradate, mostly obtuse and

caducous, scabrous; receptacle columnar, epaleaceous. Capitula 3–15-flowered, bisexual; corolla tubular, yellow, corolla throat slightly broader, corolla lobes deeply elongated, linear-oblong, spreading; style base bulbous, style branches triangular, hairy. Cypselae narrowly prismatic, 3–5-

ribbed, densely papillose, gland dotted or short-setulose; pappus of bristles, 2–3-seriate, stramineous to white.

Distinctive features: Scandent shrubs or lianas with broad, coriaceous, usually strongly discolored leaves; showy paniculate-corymbiform synflorescence; discoid capitula with cylindrical, strongly imbricate involucre, with 3–15 bisexual flowers; bright orange corolla; and pappus with 2–3 series of bristles.

Distribution: An Andean genus of ~14 species distributed from Colombia to Bolivia. Only the following three species, *L. boliviensis* (Cabrera) Cuatrec., *L. macrocephala* (Rusby) Pruski and *L. pascoensis* Sagást. & M.O. Dillon are reported as climbers; montane forests, low cloud forests and secondary vegetation; 2,330–4,000 m.

LYCOSERIS Cassini, Dict. Sci. Nat. 33: 463. 1824.

Dioecious, subshrubs, scrambling vines or lianas 3–12 m long. Branches weak and often



Lycoseris trinervis, photo A. Hernández (STRI).

scrambling. Leaves alternate, shortly petioled; blades simple, entire or serrulate, mostly discolored, triplinerved above the base. Synflorescence terminal, corymbiform or racemiform or capitula solitary; capitula radiate, heterogamous.

Involucre hemispherical to campanulate; involucre bracts 6–8-seriate; receptacle flat to convex, alveolate. Flowers usually numerous, heteromorphic; corolla orange to orange red, sometimes yellow or violet. Ray flowers sterile, bilabiate, outer lip an expanded (1–)3(–5)-toothed limb, inner apparently absent or a single linear

lobe; disc flowers tubular, relatively short 5-lobed; functional anthers present only in disc flowers of staminate capitula, basal anther appendages long-caudate, entire, sometimes with erose margins; style of pistillate flowers with base scarcely enlarged but lacking basal node, glabrous, style branches spreading, flattened, margins papillose. Cypselae cylindrical, \pm 5-ribbed; carpodium annular, narrow; pappus setae numerous (150–200) in pistillate flowers, few to many (\sim 50) in staminate flowers, flattened, with barbellate margins, whitish.

Distinctive features: Dioecious vines or lianas, mostly with scrambling branches, sterile ray flowers with bilabiate corolla, and mostly orange to orange-red corollas.

Distribution: A genus of 11 species distributed from Guatemala to NW and W South America, reaching Bolivia and southern Brazil. Eight species are reported as climbers that reach at least 2 m in length; thickets along forest margins and dense forest; 0–2,500 m.

MATTFELDIA Urban, Ark. Bot. 23A 11: 90. 1931.

Twining subwoody vines; stems slender, angular, sulcate, glabrous, minutely tuberculate.



Mattfeldia triplinervis, from Ekman H-7492 (S).

Leaves alternate, petiolate; blades coriaceous, 2–4 cm long, ovate, elliptic or lanceolate, entire or 1–4-dentate-mucronate on margins, triplinerved from near the obtuse or cuneate base.

Synflorescences paniculiform to corymbiform; capitula radiate,

heterogamous. Involucre narrowly ovoid; involucre bracts 5, uniseriate, free, lanceolate, rigid, apically recurving with age; receptacle flat, epaleaceous; peduncles slender, pilose, 7–15 mm

long, with a linear, pilose bract at base. Ray flowers 2–3, pistillate; corolla bilabiate with a short lamina and two small ventral lobes. Disc flowers bisexual, 2–3, corolla tubular; style branches truncate, penicillate. Cypselae narrowly elliptic-oblong, glabrous; pappus of numerous, slender, white bristles.

Distinctive features: Twining vines; leaves alternate, simple, triplinerved; capitula of 5, free, rigid involucre bracts. Vegetatively similar to *Leonis* but distinguished by the angled, minutely tuberculate stems (vs. cylindrical, smooth), coriaceous leaves (vs. chartaceous), and capitula with 5 involucre bracts lacking resiniferous veins (vs. 8–13 involucre bracts with 3–5 resiniferous veins).

Distribution: A Haitian genus of a single species (*M. triplinervis* Urb.) endemic to the Massif de la Hotte in Haiti, very rare, known from few collections; in scrublands; ~2,200 m.

MIKANIA Willdenow, Sp. Pl. 3(3): 1742. 1803 ['1800'] (nom. cons.).

Twining herbaceous or woody vines, or less frequently perennial erect herbs or shrubs. Stems cylindrical or hexagonal, becoming cylindrical with age, > 15 m long in some species and up to 6 cm in diam.; bark commonly beige with numerous round, dark lenticels; cross section with numerous conspicuous rays, sometimes very wide and dissecting the axial vascular tissue into radial segments, the medulla sometimes hollow (Figure 45D). Leaves opposite, petiolate or sessile; blades entire, serrate or lobed at margins, pinnately veined or

plinerved; interpetiolar acicular to foliaceous tissue (pseudo stipules) present in some species.

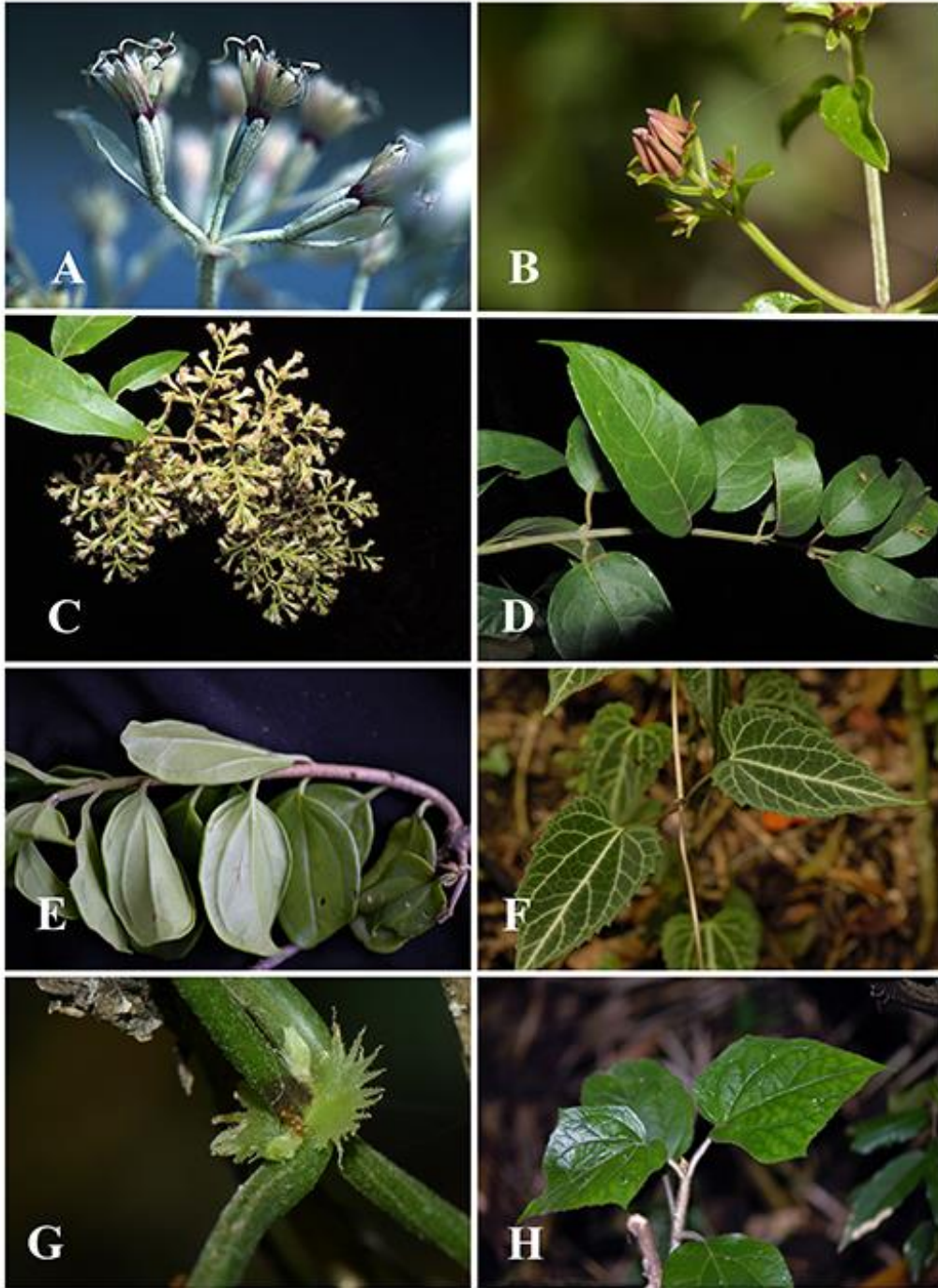


Figure 51. *Mikania*. **A.** *M. fragilis*, corymbose synflorescence. **B.** *M. stevensiana*, young capitula. **C.** *Mikania* sp., racemose-paniculate synflorescence. **D.** *Mikania* sp., leaves pinnately veined. **E.** *Mikania* sp., leaves fleshy, triplinerved. **F.** *Mikania* sp., with cordiform, variegated leaves. **G.** *Mikania* sp. with large fimbriate pseudo-stipules. **H.** *Mikania* sp., leaves plinerved, angular. Photos by P. Acevedo.

Synflorescence spiciform, paniculiform, or corymbiform, terminal or axillary; capitula discoid, homogamous. Involucre cylindrical, subtended by a subinvolucral bract that is smaller or bigger than the involucral bracts; involucral bracts 4, subequal, erect, free, overlapping. Capitula 4-flowered, bisexual; corollas tubular, shortly 5-lobed, cream or white; anthers exerted; style elongate, ascending, cream, the apical portion with a long sterile appendage. Cypselae usually prismatic, 5-ribbed, brown or black; pappus composed of bristles.

Distinctive features: Twiners with simple, opposite leaves, 4 involucral bracts and 4 flowers per capitula; plant often aromatic; stem cross sections terete, with conspicuous wide rays; exudate commonly resinous; stems sometimes quickly oxidizing after cutting them; and bark often lenticellate.

Distribution: A pantropical genus of ~450 species most of which are found in the American hemisphere, 427 species are found in the Neotropics, of which 331 are reported as twining lianas or vines; diverse habitats but most diverse in tropical moist forests, shrubby savannas of central and southern Brazil; 0–3,300 (–4,200) m.

MONTANOA Cervantes, Nov. Veg. Descr. 2: 11. 1825.

Erect shrubs, large trees, sometimes scrambling woody vines reaching several m in length. Leaves opposite, petiolate with or without wings and/or auricles; blades mostly ovate, entire, unlobed to deeply 3–5-lobed, 3(5–7)-plinerved. Synflorescence terminal, mostly paniculiform or corymbiform; capitula radiate, heterogamous, rarely discoid. Involucres mostly hemispherical; involucral bracts 3–7 in 1–2 series, subequal; receptacle convex, palea accrescent after anthesis and enfolding the cypselae. Ray flowers neutral, 0–15; corolla liguliform creamy white to white; disc flowers 3–160, bisexual, rarely functionally staminate, corolla tubular, 5-



Montanoa atriplicifolia, photo by W.J. Hayden.

lobed, yellow,
green-yellow,
greyish or creamy
white, glabrous to
densely glandular
and pubescent;
stamens yellow to
brown or black,
apex acute to
acuminate, usually
abaxially glandular;

styles yellow or yellow and black, usually glabrous, base enlarged, style branches with deltoid apices with a linear appendage. Cypselae weakly compressed, obconical and shallowly quadrangular in cross section, black to brownish black or reddish brown, striate, glabrous to sparsely pubescent; pappus absent.

Distinctive features: Scrambling, woody vines with opposite, 3(5–7)-plinerved leaves; rays white sterile; paleas accrescent and enfolding the cypsela at maturity; and cypselae smooth, brown to black, 4-angled, lacking a pappus.

Distribution: A neotropical genus of ~26 species, distributed from Mexico south to northern Peru. Only two species with radiate capitula, i.e., *M. angulata* V.M. Badillo, from Venezuela, and *M. atriplicifolia* (Pers.) Schult. Bip., from Mexico and Central America are known to sometimes grow as vines; dry disturbed habitats, cloud forests, and pine-oak forests; (100–) 1,000–2,000(–3,300) m.

MUNNOZIA Ruiz & Pavón, Prodr. Fl. Peruv. 108. 1794.

Erect or prostrate herbs or shrubs, sometimes scrambling vines reaching > 10 m in length;



Munnozia jussieui, photo by J. Calvo.

stems usually densely white-tomentose, with white latex, sometimes fistulose; nodes often with foliaceous prophylls or precocious axillary shoots. Leaves simple, opposite, long-petiolate often auriculate, wingless or winged; blades elliptic to ovate, usually basally hastate, acute or long-acuminate at apex, with entire to deeply lobed or pinnatifid margins, veins pinnate or mixed triplinerved, usually abaxially densely white-lanate. Synflorescence terminal, corymbiform to laxly cymose; capitula radiate, heterogamous. Involucre broadly campanulate to hemispherical; involucre bracts 17–70, 2–4-

seriate, acute at apex; receptacles with or without scales. Ray flowers 6–70, 1–3 seriate, pistillate; corolla liguliform, yellow (rarely lavender or whitish). Disc flowers 9–85, bisexual; corollas tubular, yellow (rarely lavender or whitish); anthers blackish, apical anther appendages ovate or triangular; style branches with papillose abaxial surface, styles base somewhat broadened. Cypselae prismatic, 6–10-ribbed, pubescent, with quadrate crystals; pappus 2–3-seriate, outer series of short scabrous bristles or distinct squamae, inner series of elongate, persistent, capillary bristles.

Distinctive features: Scrambling vines with white latex and opposite, serrate, triplinerved leaves with white-lanate indument on abaxial surface.

Distribution: A genus of ~46 species distributed from Costa Rica south to NW Argentina, mainly along the Andes. Eleven species sometimes grow as scrambling vines; montane wet forests; ~1,600 m.

MUTISIA Linnaeus. f., Suppl. Pl. 57, 373. 1782.

Tendrilled lianas or scrambling shrubs, reaching 3–8 m long; stems sometimes winged.



Mutisia speciosa, from Curtis Bot. Mag. Vol 54. Tab 2705. 1827.

Leaves simple or pinnately compound, alternate, petiolate or sessile; blades linear to lanceolate-ovate, apex acute often prolonged into a simple, short to long tendril, margins entire, dentate, lobed, runcinated, or pinnatisect, pinnately veined; in compound leaves the distal leaflet modified into a tendril. Capitula solitary, erect or pendulous; radiate, heterogamous or discoid, homogamous. Involucre cylindrical to campanulate; involucre bracts multiseriate, imbricate, unequal, acute to obtuse and mucronate at apex (the basal ones sometimes reflexed); receptacles epaleate.

Ray flowers (when present) functionally pistillate; corolla

liguliform or pseudo bilabiate, with outer lip well-developed

and inner lip reduced or absent, white, yellowish, orange, reddish or purple. Disc flowers

bisexual; corolla bilabiate, outer lip 3-dentate, inner lip deeply 2-lobed, usually yellowish; apical

anther appendages lanceolate, base caudate; style branches continuous, obtuse at apex, with

papillose on abaxial surface. Cypselae cylindrical to fusiform, glabrous; pappus usually 1-seriate, composed of plumose bristles.

Distinctive features: Tendrilled vines or scrambling shrubs with solitary erect or pendulous capitula; involucre often elongate, with striking multiseriate involucre bracts; and pappus with plumose bristles. Leaflets in compound leaves, alternate. Tendrils when present, circinate or spiral, unbranched in simple leaves and mostly branched in compound leaves. Sterile compound leaved *Mutisia* can be confused with *Cobaea* (Polemoniaceae) but distinguished by the sparingly branched tendrils (vs. many-branched in *Cobaea*).

Distribution: A South American genus of ~62 species mainly distributed through the Andes from Colombia to southern Argentina and Chile. Of these, only 31 are distributed within the Neotropics; moist forests, montane forests, rocky outcrops, semi deciduous forest, restinga forest; (50–) 1,000–3,900 m.

NARVALINA Cassini, Dict. Sci. Nat. 38: 17. 1825.

Erect shrubs, sometimes scrambling and reaching up to 4 m in length; stems slender, striate, glabrous. Leaves opposite, petiolate; blades simple, coriaceous, obovate, glabrous, margins dentate on distal ½ of blade, base cuneate, apex 3-dentate, pinnatinerved.

Synflorescence terminal, cymose, corymbiform to nearly umbellate; capitula radiate and heterogamous. Involucre cylindrical to narrow-campanulate; involucre bracts 5–10, biseriate, free, dimorphic; receptacle flat to convex, paleaceous. Ray flowers 2–3, pistillate; corolla



liguliform. Disc flowers 5–12, bisexual, corolla tubular; stamens orange to reddish brown, apical appendage longer than wide; style yellow, exserted, style branches recurved. Cypselae winged or weakly winged, truncate at apex; pappus composed of 2, retrorsely or antrorsely barbed awls. **Distinctive features:** Subwoody scrambling shrubs; leaves opposite, shiny, sharply toothed; corollas yellow; receptacle paleaceous; cypselae winged; and pappus of 2 awls.

Distribution: A genus of two species, endemic to Hispaniola (C and CW Dominican Republic and Haiti), with *N. domingensis* (Cass.) Less. sometimes growing as a scrambling shrub; moist forests and thickets, on limestone or volcanic substrates; 0–900 m.

Narvalina domingensis, photo by P. Acevedo.

NEOMIRANDEA R.M. King & H. Robinson, *Phytologia* 19: 306. 1970.

Large herbs, shrubs to small trees, rarely scrambling or epiphytic. Stems terete or



Neomirandea eximia, photo by J.E. Jiménez.

subterete, faintly to strongly striate, glabrous to densely hirsute, fistulose or solid. Leaves opposite or whorled, petioles short to long; blades elliptical or oblong, often slightly fleshy, base cuneate to cordate, margins entire to coarsely lobed and dentate, venation triplinerved from base, or pinnate. Synflorescence broadly corymbose; capitula

discoid, homogamous. Involucre cylindrical to slightly spreading; involucre bracts 9–28, moderately to strongly subimbricate, 3–4-seriate, gradate, inner often caducous; receptacle flat or slightly convex, epaleaceous, with or without hairs. Capitula 2–28-flowered, corolla tubular, lavender, outer surface with hairs or glands, with or without hairs inside the throat; corolla lobes triangular to narrowly oblong, smooth on both surfaces; anther collar elongate, apical anther appendages longer than wide; style base with or without enlargement, glabrous; style branches narrowly linear, scarcely broadened in distal part, smooth or nearly smooth. Cypselae prismatic, 5-ribbed; carpodium short; pappus of numerous (30–57) persistent bristles, uniseriate.

Distinctive features: *Neomirandea* represent one of the few epiphytic climbers in Asteraceae and can be vegetatively distinguished from other epiphytic-climbing genera in the family by absence of latex (present in *Sinclairia polyantha* (Klatt) Rydb.), leaves opposite (alternate in *Pentacalia*) and blades pinnately veined (triplinerved in *Tuberostylis*).

Distribution: A genus of 28 species occurring in humid forests from Mexico to Ecuador with major distribution in Costa Rica and Panama. *Neomirandea eximia* (B.L. Rob.) R.M. King & H. Rob., is the only species within the genus that grows as an epiphytic, scrambling liana; moist forests; 1,600–2,400 m.

NESAMPELOS B. Nordenstam, *Compositae Newslett.* 44: 58. 2006.

Scrambling or twining subwoody vines; stems cylindrical, slender, tomentose,



Nesampelos lucens, photo by P. Acevedo

glabrescent, reaching 5–6 m in length, some species with short, axillary flexuous branching. Leaves alternate, petiolate; blades coriaceous, with dentate to denticulate-spinulose margins, abaxial surface densely ferruginous arachno-tomentose, pinnatinerved. Synflorescence

terminal or axillary cymose; capitula radiate, heterogamous. Involucre campanulate to cylindrical-campanulate, calyculate; involucre bracts 5–8, subuniseriate to almost biseriate, linear-lanceolate to narrowly oblong, glabrous or tomentose, the inner bracts with scarious or membranous margins; calyculus with few small subulate bracts; receptacle flat, shortly denticulate with acuminate scales. Ray flowers 2–5, pistillate; corolla liguliform, yellow, beige or white. Disc flowers 5–13, bisexual; corolla tubular, corolla lobes ovate to lanceolate, apically thickened or papillate; anthers included, apical anther appendage ovate-lanceolate, basally obtuse or sagittate, ecaudate; style branches subtruncate with numerous short sweeping-hairs. Cypselae 10-ribbed, ciliate on upper half, with distinct carpodium; pappus bristles pluriseriate, basally connate, persistent.

Distinctive features: Subwoody scrambling or twining vines; leaves alternate with denticulate margins and ferruginous arachno-tomentose abaxial surface; capitula small, heterogamous, calyculate; and corollas yellow, cream or white.

Distribution: A genus of three species, endemic to Hispaniola (CW Dominican Republic and Haiti); moist forests and thickets, on limestone or volcanic substrates; 900–1,900 m.

OBLIVIA Strother, Syst. Bot. 14: 541. 1989.

Scrambling vines with short decussate branches. Leaves opposite, petiolate; blades lanceolate, elliptic to ovate, 3–5-plinerved or acrodromous. Synflorescence terminal, congested, corymbiform; capitula radiate, heterogamous. Involucre campanulate; involucre bracts in 2–4 series, subequal; receptacle convex, paleaceous. Ray flowers pistillate; corolla liguliform, orange yellow. Disc flowers bisexual, corolla tubular, bisexual, dull yellow, without fibers embedding the vascular strands; anthers black, apical anther appendages with glandular trichomes; style branches tapered. Cypselae transversely compressed, triquetrous, narrowly oblanceolate in outline, shallowly winged; disc cypselae compressed, otherwise as ray cypselae; pappus of 2(–4) erect awns and a few squamellae between them.

Distinctive features: Scrambling shrubs with 3–5-plinerved or acrodromous leaves (*O. mikanioides* (Britton) Strother); disc corolla throats without dark fibers; and cypselae symmetrically winged with straight awns.

Distribution: A genus of three species from northern South America, i.e., *O. ceronii* H. Rob. from Ecuador, *O. mikanioides* (Britton) Strother from Venezuela, Ecuador, Peru, Bolivia, and Brazil (Acre), and *O. simplex* (V.M. Badillo) H. Rob. from Venezuela; moist tropical forests on lower montane slopes; 200–1,400 m.

ODONTOCLINE B. Nordenstam, Opera Bot. 44: 23. 1978.

Shrubs, small trees, or scrambling subwoody vines, 3–4 m long. Stems cylindrical,



Odontocline hollickii, photo by F. Herrera.

slender, striate. Leaves alternate, petiolate;

blades simple, chartaceous, ovate to

lanceolate, entire (in climbing species),

acuminate at apex, glabrous, pinnatinerved.

Synflorescence axillary, long peduncled,

corymbiform; capitula radiate, heterogamous.

Involucre narrowly campanulate to

subcylindrical, minutely calyculate;

involucral bracts 5–13, uniseriate, free, erect; calyculus of a few minute bracts; receptacle flat denticulate. Ray flowers pistillate, 2–6; corolla liguliform, ligule as long as the tube, 4 veined, 3-toothed. Disc flowers bisexual, 3–25; corolla tubular; anthers exserted, caudate at base; style swollen at base, style branches apically rounded-obtuse with subterminal sweeping hairs. Cypselae narrowly oblong, subterete, ribbed, glabrous or sparsely hirsute, with an annular carpopodium; pappus of pluriseriate, erect, barbellate, tawny bristles.

Distinctive features: Subwoody scrambling vines with terete, striate, glabrous stems; leaves alternate, simple, entire, acuminate at apex, glabrous; synflorescences long peduncled, corymbiform; and capitula heterogamous, with few orange flowers.

Distribution: A Jamaican genus of six species, with *O. hollickii* (Greenm.) B. Nord. as the only climbing species; distributed in woodlands and thickets on limestone substrate in central Jamaica; 400–800 m.

OLIGACTIS (Kunth) Cassini in F. Cuvier, Dict. Sci. Nat. 36: 16. 1825.

Erect herbs, shrubs, or loosely twining vines with short, opposite branches. Leaves



Oligactis sessiliflora, photo by N. Baresch Uribe.

opposite, with bases sometimes confluent across nodes; blades commonly discolor (whitish or ferruginous below), entire or denticulate at margins, pinnately veined. Synflorescences axillary or terminal, subglomerate, spiciform or racemose; capitula radiate, heterogamous. Involucre broadly campanulate; involucre bracts 16–55, 4–5-seriate; receptacle ridged and squamelliferous. Ray flowers 3–5, pistillate; corolla liguliform, yellow, limb short. Disc flowers 3–5, bisexual; corolla tubular, yellow; apical anther appendage papillose, thecae bases digitate; style

branches long. Cypselae 5–8-ribbed, with glands and contorted setae; pappus of bristles, biseriate, the outer 10–15, squamellae (1–2 mm long), caducous, the inner 20–35 (5–6 mm long), tips often broad.

Distinctive features: Loosely twining vines with opposite branches; stems and young shoots arachno-tomentose; leaves opposite, simple, entire or denticulate, discolor, abaxially cinereous-sericeous; receptacle ridged and squamelliferous; anthers with papillose apical appendage; and pappus biseriate.

Distribution: A genus of 16 species distributed from Costa Rica to NW South America.

Oligactis garcia-barrigae H. Rob. (Colombia), *O. sessiliflora* (B.L. Rob.) R.M. King & H. Rob. and *O. volubilis* (Kunth) Cass. (Colombia and Venezuela) are the only three species reported as vines; upper forest slopes; 1,200–3,200 m.

OPHRYOSPORUS Meyen, Reise 1: 402. 1834.

Erect shrubs, some species sometimes scrambling and vine-like, 2–3 m long; stems



Ophryosporus sodiroi, photo by J. Calvo.

cylindrical, slender, with numerous, short, axillary decussate branches. Leaves opposite, petiolate; blades broadly lanceolate to elliptical, acute to short-acuminate, coarsely to scarcely serrate, venation strongly to weakly triplinerved or acrodromous. Synflorescences corymbiform or thyrsoid, with corymbose branches; capitula discoid, homogamous.

Involucre campanulate or cylindrical; involucre bracts 4–8, 1–2-seriate, eximbricate, mostly subequal, persistent;

receptacle slightly convex, glabrous. Flowers (3–)4–10(–12),

bisexual; corolla tubular, whitish, yellowish or greenish,

throat usually abaxially glanduliferous, glabrous or rarely puberulous inside, lobes 1–2 times as long as wide, smooth; apical anther appendages null or rudimentary, entire or emarginate, anthers rounded or slightly auriculate at the base, anther collar cylindrical or balustriform; style base cylindrical, glabrous, style branches clavate, dorsally papillose; stylopodium present (nectary). Cypselae prismatic, 5-ribbed, pyriform, straight to slightly falcate, sometimes shortly stipitate, sericeous and/or glandular, with paired hairs or glandular trichomes; carpodium annular or cylindrical, enlarged to the base, central or eccentric; pappus white, pale yellow or brown, of one series of persistent bristles, basally fused in a ring, with scales or absent.

Distinctive features: Scrambling vines with simple, opposite serrate triplinerved or acrodromous leaves; obsolete apical anther appendages; eximbricate involucre with few bracts; clavate style branches; and a prominent carpodium.

Distribution: A South American genus of 42 species, 12 of which sometimes grow as scrambling shrubs or vines. These are found in Ecuador, Peru, Bolivia and SE Brazil (Plos & Sancho 2013); montane primary forests, semi deciduous forests, and rainforests; 700–3,500 m.

ORTIZACALIA Pruski, *Phytoneuron* 2012-50: 1. 2012.

Scrambling shrubs or lianas; stems terete, smooth or slightly striate, glabrescent, reaching



Ortizacalia austin-smithii, photo by B. Hammel.

~2 m in length.

Leaves alternate, petiolate; blades simple, subfleshy, oblanceolate to oblong, obtuse at apex (sometimes minutely mucronate), glabrous, with

entire margins, pinnatinerved. Synflorescence mostly terminal, corymbiform-paniculate; capitula shortly radiate, heterogamous. Involucre cylindrical, loosely calyculate; involucre bracts uniseriate, 8, free, acute; calyculus of a few bracts; receptacles flat, epaleaceous, crestate. Ray flowers pistillate, corollas liguliform, short. Disc flowers bisexual, corolla tubular, 5-lobed;

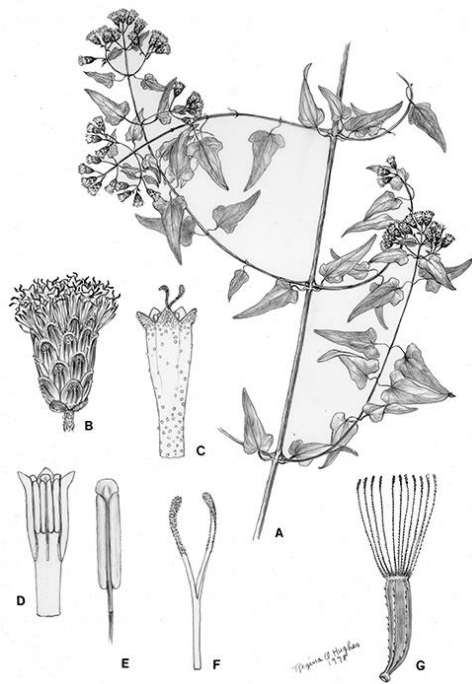
apical anther appendage ovate, anther bases caudate; style branches rounded, long-penicillate. Cypselae subcylindrical, 5-costate, glabrous; pappus of numerous, caducous, capillary, scabridulous bristles.

Distinctive features: Scrambling vines or lianas with alternate, petiolate, glabrous leaves; short-radiate capitula; caudate anther bases; and long-penicillate style branches.

Distribution: A genus of a single species, *O. austin-smithii* (Standl.) Pruski, restricted to rainforests of northern Costa Rica; 1,300–1,900 m.

OSMIOPSIS R.M. King & H. Robinson, *Phytologia* 32: 250. 1975.

Scrambling vines, with numerous, short opposite branches; stems cylindrical or slightly angled when young, slender (up to 1 cm diam.), with corky bark near the base. Leaves opposite,



Osmiopsis plumieri, drawing by R. Hughes.

petiolate; blades simple, lanceolate, or 3–5-lobed at the base, triplinerved, abaxially glandular punctate. Synflorescence terminal paniculiform, frondo-bracteate; capitula discoid, homogamous. Involucre cylindrical to narrowly campanulate; involucre bracts caducous, overlapping in 5–6 series; receptacle flat or slightly convex. Capitula with 18–26 flowers, bisexual; corolla tubular, lobes densely glandular; apical anther appendage short, oblong, broader than long; style branches, elongate, papillose and widened at the apex. Cypselae prismatic, 5-ribbed, sparsely glandular or

minutely spiculate, carpodium shortly cylindrical; pappus with ~25–30 uniseriate, scabrid bristles.

Distinctive features: Similar to *Chromolaena* in its habit (subwoody scrambling vine with terete stems and trilobed and glabrous opposite leaves) and its involucre (cylindrical to narrowly campanulate with caducous phyllaries in 4–5 series) but distinguished by the glanduliferous corolla lobes (glabrous in *Chromolaena*) and style branches that are wider at the distal portion (filiform in *Chromolaena*).

Distribution: A genus of a single species (*O. plumieri* (Urb. & Ekman) R.M. King & H. Rob.) endemic to Hispaniola; found in the Cordillera Central of Dominican Republic and in Morne à Cabrits in Haiti; distributed in forests and thickets; 100–1,800 m.

OTEIZA La Llave, Reg. Trimestre 1: 41. 1832.

Erect herbs or less often scrambling vines with stems reaching 2.5 cm diam. at the base and ~4 m in length. Leaves opposite, petiolate or sessile; blades simple, narrowly to broadly ovate, serrate, triplinerved. Synflorescence terminal, congested corymbiform; capitula radiate, heterogamous. Involucre campanulate to hemispheric; involucre bracts in 3–5 series, strongly gradate, membranaceous to scarious; receptacle cone-shaped, palea narrow. Ray flowers pistillate; corolla liguliform white or whitish green. Disc flowers bisexual; corolla tubular yellow; apical anther appendages ovate; style branches with broad, acute to obtuse, papillose apices. Cypselae obconical, black, glabrous; pappus of multiple, unequal, caducous bristles.

Distinctive features: Scrambling vines with opposite, simple, serrate, triplinerved leaves and short axillary decussate branches; capitula radiate, the receptacle conical and paleaceous; ray

petals white, disc corollas yellow; cypselae obconical with caducous pappus of multiple bristles of different lengths.

Distribution: A genus of four species, of which *O. ruacophila* (Donn. Sm.) J.J. Fay from Mexico and Guatemala sometimes grows as a vine to 4 m long; dry oak or pine-oak forests to mesic cloud forests; 2,400–2,600 m.

OTOPAPPUS Bentham, Gen. Pl. 2: 196, 380. 1873.

Notoptera Urb. (1901).

Erect shrubs, small trees or woody scrambling vines, 3–15 m long. Stems cylindrical, 3–



Otopappus imbricatus, photo by P. Acevedo.

4.5 cm diam; cross sections with regular anatomy, with numerous conspicuous rays, some species forming phloem wedges with interrupted cambium. Leaves opposite, petiolate; blades lanceolate to ovate, serrulate or denticulate, subglabrous to villous, pinnately veined or 3–5(–7)-plinerved from near base. Synflorescence terminal, small paniculiform or corymbiform, or capitula solitary; capitula radiate or rarely discoid. Involucre campanulate to hemispherical; involucre bracts in 4–6 series, mostly strongly gradate, but the outermost series sometimes loose and leafy, longer than the head itself; receptacle

convex to conical, paleaceous. Ray flowers 8–34, pistillate, fertile; corollas minutely 2–3-lobed yellow or orange-yellow. Disc flowers bisexual; corollas yellow, orange-yellow, or rarely white;

anthers black or deep purple, appendages with glandular trichomes; style arms tapered. Cypselae oblanceolate or ellipsoid, black or brown, glabrous or puberulent, especially at apices; ray cypselae triquetrous or laterally compressed, winged at the ventral side or at all three angles; disc cypselae radially flattened to somewhat 3-sided with winged margins, these extending onto the 1 or 2 lateral awns, several or more short scales are present, these often united into a crown; pappus of one to three awns and connate or free minute squamellae between them, the awns fused to the wings.

Distinctive features: Scrambling lianas 3–15 m long; leaves opposite, simple, serrulate with pinnate or 3–5(–7)-plinerved venation; capitulum receptacle paleaceous; cypselae strongly asymmetrical-winged and pappus with awns.

Distribution: A genus of 16 species from Mexico, Central America and Jamaica, 12 of which are reported as climbers but half of these sometimes grow as erect shrubs; pine-oak forests, lowland or montane rainforests, scrubs, and secondary or disturbed vegetation; 0–2,100 m.

PARACALIA Cuatrecasas, Brittonia 12: 183. 1960.

Erect or scrambling shrubs reaching 3–10 m long; stems terete, slightly striate, glabrous or puberulous. Leaves alternate, petiolate; blades simple, elliptic to broadly ovate, acute to obtuse at apex, mucronate or slightly acuminate, entire or shallowly sinuate-lobed, pinnate or somewhat palmatinerved, glabrous or glabrescent. Synflorescence corymbiform or paniculiform; capitula discoid, homogamous. Involucre cylindrical, ecalyculate; involucre bracts uniseriate, 5, free, obtuse at apex; receptacles flat, epaleaceous. Capitula 5-flowered, bisexual; corollas tubular, whitish, with deep lobes; apical anther appendage triangular to oblong, anther bases acute to sagittate, filaments collars barely broadened at base; style branches continuous, acute or

subacute at apex with sweeping trichomes. Cypselae cylindrical, glabrous; pappus of numerous, caducous, capillary, scabridulous bristles.

Distinctive features: Scrambling shrubs with alternate, simple leaves; discoid capitula composed of 5 involucre bracts; 5 deeply lobed, white corollas; and acute to sagittate anther bases.

Distribution: A genus of two or three species, distributed in the Andes of Bolivia and Peru.

Paracalia pentamera (Cuatrec.) Cuatrec. from Bolivia is the only species in this genus that grows as a vine; humid tropical forests and montane forests; 850–1,700 m.

PENTACALIA Cassini, Dict. Sci. Nat. 48: 449, 461, 466. 1827.

Scrambling shrubs or lianas, sometimes with twining branches or root-climbing epiphytes; stems terete, striate or smooth, glabrous or with indumentum, in some species reaching > 12 m in length, some species with numerous, short, lateral branches; cross sections with regular anatomy showing numerous conspicuous rays (e.g., *P. desiderabilis* (Vell.) Cuatrec.). Leaves alternate (opposite in 3 Peruvian species), petiolate; blades simple, chartaceous, coriaceous or fleshy, lanceolate, oblanceolate, elliptic, ovate, or obovate, acuminate to rounded at apex, with entire to dentate (usually remotely mucronate-denticulate) margins, glabrous to covered by different types of indumentum (trichomes usually simple, multicellular, eglandular, rarely T-shaped), pinnatinerved. Synflorescence terminal or axillary, usually thyrsoid-paniculiform or corymbiform (sometimes thyrsoid-racemiform); capitula discoid, homogamous or radiate and disciform, heterogamous. Involucre cylindrical to campanulate, calyculate; involucre bracts uniseriate, usually 8–13, free, acute; calyculus of few to numerous bracts; receptacles flat, epaleaceous, smooth or somewhat irregularly alveolate.

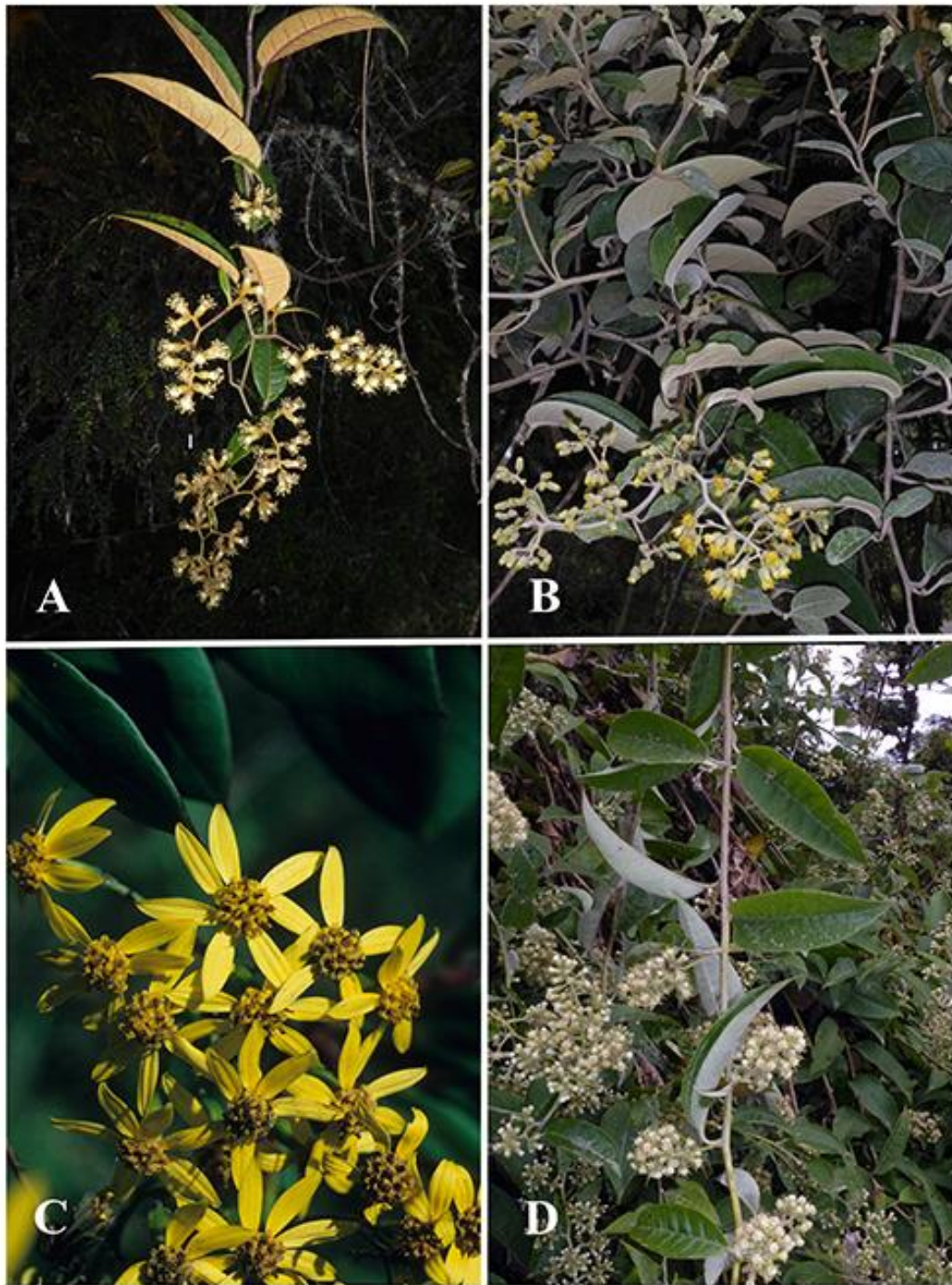


Figure 52. Climbing *Pentacalia*. **A.** *P. oronocensis*. **B.** *P. disciformis*. **C.** *P. epiphytica*. **D.** *P. beckii*.
Photos: A, B, D by J. Calvo; C by P. Acevedo

Ray or peripheral flowers pistillate, corollas liguliform or tubular-filiform. Disc flowers bisexual, corolla tubular, 5-lobed; apical anther appendage triangular to oblong, anther bases sagittate to caudate (rarely auriculate); style branches, truncate to obtuse at apex with sweeping trichomes. Cypselae cylindrical, 5–10-costate, glabrous or pubescent; pappus of numerous, caducous, capillary, scabridulous bristles.

Distinctive features: Scrambling, root-climbing or rarely twining vines or lianas with alternate, simple, pinnatinerved leaves; involucre calyculate; ray flowers (when present) yellow; anther bases sagittate to caudate; and style branches truncate to obtuse with sweeping trichomes.

Distribution: A genus of ~160 species of climbers or facultative climbers; distributed from southern Mexico to northwestern Argentina, plus two disjunct species thriving in the Brazilian Atlantic Forest. The highest species diversity occurs in the montane forests of Colombia, Ecuador, and Peru; (250–) 1,500–4,000 m.

PERYMENIOPSIS H. Robinson, *Phytologia* 40: 495. 1978.

Scrambling shrubs 1–2.5 m long. Leaves opposite, petiolate; blades simple, oblong,



Perymeniopsis ovalifolia, photo by P. Acevedo.

triplinerved from above the base. Synflorescence terminal, paniculiform; capitula pedunculate, radiate, heterogamous. Involucre campanulate to hemispherical; involucre bracts in 2–3 series; receptacle convex, paleaceous, paleas linear, apex obtuse. Ray flowers sterile; corolla liguliform, golden bright yellow, adaxial papillose. Disc flowers bisexual; corolla yellow; anthers black, apical anther appendage ovate with minute glandular trichomes; style branches tapered; apices

papillose. Cypselae compressed, obovate, black, shallowly winged, wings wider at distal apices, cypselae bases narrowed, essentially glabrous; pappus of two, early caducous awns at the angles of the cypselae and a small rostrum bearing numerous minute and easily caducous awns.

Distinctive features: Scrambling shrubs with opposite, simple, triplinerved leaves; sterile ray flowers; pappus formed by a subapical cluster of short, caducous setae; and awns at the angles of the cypselae.

Distribution: A genus of a single species, *P. ovalifolia* (A. Gray) H. Rob. endemic to Central Mexico; moist areas, disturbed brushy sites in cloud forest, secondary vegetation, and forests; 610–1,900 m.

PIPTOCARPHA R. Brown, Observ. Compos. 121. 1817.

Scrambling lianas, erect to clambering shrubs or rarely trees with stellate or scaly pubescence; stems cylindrical or quadrangular when young, becoming cylindrical with age; cross



Piptocarpha tetrantha, photo by P. Acevedo.

section with cylindrical xylem dissected by narrow or inconspicuous rays and containing wide vessels, and sometimes a large quadrangular medulla with thin-walled cells (Figures 44A, 45F). Leaves alternate, petiolate; blades simple, > 6 cm long, often abaxially densely covered with whitish, silvery, or golden

stellate or scaly pubescence, pinnatinerved. Synflorescence corymbiform, umbelliform, spicate, or paniculiform; capitula discoid, homogamous. Involucre campanulate or cylindrical-

campanulate; involucre bracts numerous, in several overlapping series, caducous; receptacle flat, glabrous, epaleaceous. Capitula 2–20-flowered, bisexual; corollas tubular, cream or white, shortly 5-lobed (these often glandular dotted); anthers base sagittate, exserted, cream or maroon; style slender, with 2, slightly curved, hispidulous style branches. Cypselae cuneate, 10-ribbed, glabrous, truncate; pappus biseriate, composed of bristles or the outer series sometimes of scales.

Distinctive features: Scrambling woody vines or shrubs with arched, spreading-hanging branches; leaves alternate, coriaceous, entire, pinnatinerved, often abaxially densely covered with light colored stellate or scaly pubescence; capitula campanulate or cylindrical campanulate with overlapping multiseriate involucre bracts, caducous; and flowers bisexual, cream or white.

Distribution: A genus of 46 species distributed in the Neotropics, 37 of which are scrambling lianas; in moist forests or rainforests, gallery forests on terra firme, or montane wet forests; 300–1,500 (–2,000) m.

PIPTOCOMA Cassini, Bull. Sci. Soc. Philom. Paris 1817: 10. 1817.

Erect shrubs, sometimes scrambling and vine-like; stems angular, tomentose, glabrescent. Leaves alternate, petiolate; blades simple, the lower surface often with stellate, ferruginous trichomes, pinnately veined. Synflorescence of clustered short-pedunculate glomerules to form corymbiform cymes; capitula discoid, homogamous. Involucre cylindrical to campanulate; involucre bracts in several gradate series; receptacle paleaceous or not. Capitula with 4–12



Piptocoma acevedoi, photo by O. Rivera.

flowers, bisexual; corolla tubular, pale violet, 5-lobed, lobes $\frac{1}{4}$ as long as the tube, often papillate on outer surface; anthers slightly exserted, cream or pale violet; style filiform, style branches recurved, abaxially hispidulous. Cypsela turbinate, 5-angled, glabrous; pappus biseriate, inner series of barbate bristles, outer series of short, irregular scales.

Distinctive features: Woody scrambling shrubs; leaves alternate simple, abaxially ferruginous stellate pubescent; and capitula homogamous with pale violet corollas.

Distribution: A genus of 18 species, distributed in the Neotropics, with only 3 species reported as vines, of these, *P. rufescens* Alain is found in Hispaniola, *P. samanensis* Alain in Dominican Republic and *P. acevedoi* Pruski in western Puerto Rico; moist forests on limestone or serpentine substrate; 300–600 m.

PSEUDOGYNOXYS (Greenman) Cabrera, Brittonia 7: 54. 1950.

Herbaceous to subwoody twining vines, 3–10 m long; stems cylindrical, weak, striate, puberulous. Leaves alternate, petiole sometimes narrowly auriculate; blades simple, entire or rarely lobed, margins often serrate, pinnatinerved. Synflorescence corymbiform or capitula solitary; capitula radiate, heterogamous, long-pedunculate. Involucre campanulate or hemispherical, calyculate; involucral bracts uniseriate, oblong; calyculus of few scale-like bracts. Ray flowers pistillate, corolla liguliform, orange-red, orange or yellow. Disc flowers bisexual,



Pseudognoxys cumingii, photo by P. Acevedo.

corolla tubular, yellow;
anther base obtuse to
sagittate, ecaudate; style
branches hirsute on the
distal portion. Cypselae
cylindrical, ribbed,
glabrous, puberulous or
hirsute; pappus of
numerous bristles, slender.

Distinctive features: Herbaceous to subwoody twining vines with alternate leaves and showy heterogamous capitula with orange-red flowers.

Distribution: A genus of 16 species, distributed from northern Mexico to northern Argentina, 13 of which are described as vines; one species *P. chenopodioides* (Kunth) Cabrera is cultivated and naturalized in the West Indies; dry seasonal forests to montane forests; 0–3,000 m.

QUECHUALIA H. Robinson, Proc. Biol. Soc. Washington 106: 780. 1993.

Erect or scrambling shrubs to 5 m tall; stems sparsely to densely pilose with simple or T-shaped hairs. Leaves alternate, petioles narrow, usually short; blades ovate to elliptical or obovate, membranaceous, pinnately veined. Synflorescence thyrsoid with corymbiform cymose branches; capitula discoid, homogamous, pedunculate. Involucre campanulate, 1–2 cm wide; involucre bracts 60–90 in 5–6 series; receptacle epaleaceous. Flowers 30–55, bisexual; corolla tubular, lavender, throat shorter than the linear lobes, with or without long hairs inside, lobes with short, stiff, unicellular hairs outside; apical anther appendage with glands, anther thecae



Quechualia fulva, photo by Ecojardineria.ar.

spurred (calcarate), caudate, tails
denticulate; style with basal node, upper
style shaft and branches with mostly
pointed hairs. Cypselae 8–10-ribbed,
setiferous; pappus biseriate, outer series
with short crowded squamellae, capillary,
inner series of white capillary bristles.

Distinctive features: Scrambling shrubs,
with asymmetrical T-shaped hairs; leaves

alternate, simple; synflorescence narrowly thyroid, long-pedunculate; capitula involucre 1–2 cm
wide, with 30–55 flowers per capitulum; corolla lobes externally pubescent; and apical anther
connective glandular.

Distribution: A genus of four species found from Peru to Argentina, with the following three
species: *Q. fulva* (Griseb.) H. Rob., *Q. smithii* H. Rob. and *Q. trixioides* (Rusby) H. Rob.,
reported as climbers; in montane wet forest; 600–2,300 m.

SALMEA de Candolle, Cat. Horti Monspel. 140. 1813 (nom. cons.).

Erect or clambering shrubs, or twining vines; stems striate, cylindrical. Leaves opposite,
petiolate; blades simple, entire or dentate, pinnatinerved. Synflorescence terminal, cymose;
capitula discoid, homogamous, pedunculate. Involucre narrow-campanulate, ecalyculate;
involucral bracts in 1–6 series; receptacle conical, paleate. Capitula with numerous flowers, each
flower subtended by a palea; corolla tubular, shortly 5-lobed, cream or white; stamens 5, anthers



Salmea orthocephala, photo by K. Velasco.

exserted, sagittate; style filiform, with 2 papillose-hirtellous style branches. Cypsela compressed, cuneiform, strigose along the margins; pappus of 2 short bristles.

Distinctive features: Scrambling or weakly twining vines with opposite, simple pinnatinerved

leaves; capitula discoid,

homogamous, the flowers subtended by a palea; corolla tubular, shortly 5-lobed, cream or white; and pappus of 2 bristles.

Distribution: A neotropical genus of 11 species, two of which (*S. scandens* (L.) DC. distributed throughout the Neotropics, and *S. orthocephala* Standl. & Steyerl. from S Mexico, Guatemala and Honduras) are sometimes reported as climbers; moist forests; 10–800 m.

SAMPERA V.A. Funk & H. Robinson, Proc. Biol. Soc. Washington 122: 158. 2009.

Scrambling or erect shrubs; stems terete to strongly hexagonal, mostly tomentose. Leaves opposite, petioles winged or not, sometimes included in perfoliate leaf pairs; blades ovate to



Sampera coriacea, drawing by A. Tangerini.

oblong, acute at apex, margins subentire to serrate, pinnatinerved, upper surface flat to slightly bullate, densely tomentose below. Synflorescence terminal, corymbiform; capitula radiate, heterogamous, peduncles thinly to densely tomentose. Involucre broadly campanulate; involucre bracts 30–55, 4–5-seriate, narrowly ovate to lanceolate, tips obtuse to narrowly acute, outer surface puberulous to arachnoid tomentose or hirsute; receptacles with lacinate squamae or ridges. Ray flowers (2–)6–18, pistillate; corolla liguliform, yellow.

Disc flowers 10–34, bisexual; corollas tubular, yellow; apical anther appendages oblong to ovate, smooth, anther bases sagittate; style base scarcely broadened, style branches continuous, with papillose abaxial surface. Cypselae prismatic, 5–8-ribbed, glandular, with contorted setae and subquadrangle crystals; pappus biseriate, outer series of short bristles or squamellae, inner series of elongate, persistent, capillary bristles.

Distinctive features: Scrambling shrubs with opposite, discolorous leaves abaxially tomentose; synflorescence terminal, corymbiform; flowers 16–52 per capitulum; apical anther appendages smooth; and cypselae glandular with setae.

Distribution: A genus of eight species distributed from Colombia southward to northern Peru, with the majority of the species in Ecuador, all of which have been recorded as scrambling shrubs or vines; montane, primary rainforest; 2,000–3,400 m.

SANTOSIA R.M. King & H. Robinson, *Phytologia* 45: 463. 1980.

Woody, scrambling (?) vines; stems cylindrical, striate, reaching 3–4 m long. Leaves opposite, slender petiolate; blades lanceolate, base obtuse to rounded, margins subentire, apex acuminate, acrodromous from base, glabrous. Synflorescence elongate, thyrsoid paniculate with corymbiform to pyramidal branches; capitula discoid, homogamous, peduncle short. Involucre campanulate; involucre bracts ~13, subimbricate in ~3 unequal series, ovate-lanceolate, inner bracts easily caducous; receptacle flat to slightly convex, glabrous. Capitula with 8–10 flowers; corolla tubular, white, with broadly cylindrical base, glabrous on outer surface, corolla lobes more than twice as long as wide, smooth on both surfaces; apical anther appendage longer than wide, anther collar short cylindrical; style base not enlarged, glabrous, style branches linear, mammillate below. Cypselae prismatic, 5-ribbed, sparsely setiferous mostly on ribs; carpodium distinctly symmetrical, forming a basal ring; pappus of ~20 scabrid, persistent bristles in 1 series.

Distinctive features: Glabrous, scrambling (?) vines with opposite, simple, acuminate leaves, with acrodromous venation and serrulate margins; involucre inner bracts early caducous; and corolla white, the lobes more than twice as long as wide, glabrous or subglabrous on outer surface.

Distribution: A genus of a single species, i.e., *S. talmonii* R.M. King & H. Rob., endemic to the coastal region of southern Bahia in Brazil; wet forests; 80–100 m.

SENECIO Linnaeus, *Sp. Pl.* 866. 1753.

Aetheolaena Cass. (1827); *Lasiocephalus* Willd. ex Schtdl. (1818).

Annual or perennial herbs, subshrubs or shrubs, and small trees, sometimes scrambling



Senecio patens, photo by J. Calvo.

shrubs 1–4 m long; stems terete, striate or smooth, glabrous or pubescent (multicellular, simple hairs).

Leaves alternate, petiolate (rarely with alate petioles); blades narrowly to broadly lanceolate (palmatifid in non-native species), chartaceous or slightly coriaceous, glabrous or variously pubescent, acute to acuminate at apex, with subentire to dentate margins, pinnatinerved (palmatinerved in non-native species). Synflorescence usually thyrsoïd-paniculiform or corymbiform; capitula discoid, homogamous, nodding (radiate or discoid,

erect in non-native species). Involucre cylindrical to

campanulate, usually calyculate; involucral bracts uniseriate, usually 13–21, free, rather acute at apex; calyculus usually of numerous bracts; receptacles rather flat, epaleaceous, smooth or somewhat irregularly alveolate. Capitula with 25–95 flowers, bisexual (4–5 yellow ray flowers in *S. tamoides*); corolla tubular, usually cream or yellowish; apical anther appendage triangular to oblong, obtuse to auriculate at base, filament collar balustriform; style branches penicillate at apex (truncate in non-native species). Cypselae cylindrical, glabrous; pappus of numerous, caducous, capillary, scabridulous bristles.

Distinctive features: Scrambling shrubs with alternate simple leaves, discoid, nodding capitula and penicillate style branches.

Distribution: An almost cosmopolitan genus with over 1,250 species with a small group of scandent species distributed in the Andes of Venezuela, Colombia, Ecuador, Peru, and Bolivia.

This group includes ~11 species previously treated as *Lasiocephalus* Willd. ex Schldl. and *Aetheolaena* Cass.; montane forests; 2,400–4,400 m.

Two South African species are cultivated and sometimes naturalized in the Neotropics, i.e., *S. tamoides* DC. and *S. mikanioides* Otto ex Walp. Their palmatilobed leaves easily distinguish them from the native species of *Senecio*. *Senecio tamoides* has radiate capitula whereas those of *S. mikanioides* are discoid.

SINCLAIRIA Hooker & Arnott, Bot. Beechey Voy. 433. 1841.

Erect or scrambling shrubs or vines up to 10 m long, sometimes epiphytic; stems



Sinclairia discolor, photo by O. López Francisco.

cylindrical, striate, usually tomentose,

with white latex, and sometimes

underground tubers. Leaves opposite or

alternate, petiolate, wingless or winged

and perfoliate; blades ovate to

suborbicular or triangular, acute to

attenuate at apex, with remotely

mucronate-denticulate to coarsely dentate

or deeply lobed margins, triplinerved, glabrous or albo-tomentose on abaxial surface.

Synflorescence corymbiform, terminal or axillary; capitula radiate, heterogamous or discoid,

homogamous. Involucre narrowly to broadly campanulate; involucre bracts 3–5-seriate, rounded

to narrowly acuminate at apex; receptacles glabrous or with minute spikes or trichomes. Ray

flowers absent or 4–25, pistillate; corolla liguliform, yellow, orange yellow. Disc flowers 5–30,

bisexual; corolla tubular, yellow; apical anther appendage lanceolate to ovate, anther base

sagittate to caudate, minutely crenulate distally; styles base barely broadened or not so, style branches continuous, with papillose abaxial surface. Cypselae prismatic, mostly 5-ribbed, glabrous to densely setulose with elongate crystals; pappus biseriate, outer series of short usually squamelliform setae, inner series of elongate, persistent, capillary bristles.

Distinctive features: Scrambling vines several meters long, with white latex; leaves opposite, simple, serrate, serrulate or undulate at margins, triplinerved, discolorous, abaxial surface albotomentose; and cypselae with elongate crystals.

Distribution: A neotropical genus of ~29 species distributed from Mexico and Central America to western Colombia. Six species are often collected as scrambling vines, but sometimes as erect subshrubs; wooded slopes, edge of cloud forests, and tropical deciduous forests; 200–2,000 m.

SPHAGNETICOLA O. Hoffmann, Notizbl. Königl. Bot. Gart. Berlin 3: 36. 1900.

Decumbent herbs, sometimes scrambling; stems with adventitious roots at the nodes.



Sphagneticola trilobata, photo by P. Acevedo.

Leaves opposite, petiolate; blades lanceolate to trullate, trilobed, serrate, triplinerved. Capitula terminal, appearing axillary, solitary, pedunculate, radiate, heterogamous. Involucre funnel-shape, ecalyculate; involucre bracts in 2–3 series, foliaceous; receptacle paleaceous. Ray flowers pistillate, corolla liguliform, yellow or orange. Disc flowers bisexual, subtended by a palea, corolla tubular, yellow or orange; anthers black; style filiform, with 2 papillose-hirtellous

stigmatic branches. Cypselae tuberculate, prismatic, black; pappus minute forming a fimbriate “corona”.

Distinctive features: Herbaceous or subwoody scrambling or creeping vines; leaves opposite, triplinerved, cuneate at base, with dentate margins; capitula solitary, long peduncled; and radiate flowers liguliform yellow.

Distribution: A genus of four species, with pantropical distribution, 3 of them native to the New World, with *S. trilobata* (L.) Pruski, generally growing as a creeping herb, sometimes found growing as a vine 2–3 m long; native to continental tropical America, introduced in the West Indies and the Paleotropics; moist, open, disturbed areas; 0–1,500 m.

STEYERMARKINA R.M. King & H. Robinson, *Phytologia* 22: 43. 1971.

Scrambling vines; stems cylindrical, slender, reaching 6-8 m in length. Leaves opposite, shortly petiolate; blades chartaceous to subcoriaceous, ovate, base obtuse to rounded, margins entire, apex obtuse to acute, venation pinnate or sometimes subtriplinerved in lower pairs of leaves, with or without hairs or glandular punctuations below. Synflorescence laxly paniculate; capitula discoid, homogamous, subsessile in small clusters or distinctly pedicellate. Involucre cylindrical; involucral bracts 15–20, subimbricate, in 4–5 strongly unequal gradated series; receptacle convex to slightly conical, usually glabrous. Capitula 3–5-flowered; corolla tubular, white, outer surface glabrous or with minute glands or large hairs on base of throat and lobes, inner surface of throat densely pilose, lobes oblong with triangular tips, 2–4 times as long as wide; apical anther appendage large, triangular, about twice as long as wide, anther collar narrowly cylindrical; style base not enlarged, glabrous, style branches linear mammillate.

Cypselae prismatic, 5–6-ribbed, densely short setulose; carpodium distinct, short; pappus of ~30 scabrid slender congested persistent bristles.

Distinctive features: *Steyermarkina* is vegetatively similar to *Mikania* but distinguished by the scrambling habit (vs. twining), 15–20 (vs. 4) involucre bracts, 3–5 (vs. 4) flowers per capitulum, densely pubescent inner corolla surface with elongated lobes (vs. glabrous, with short lobes) and the densely short setiferous cypselae (vs. glabrous or pilose), respectively.

Distribution: A South American genus of four species, with disjunct distribution between E & SE Brazil and Venezuela, three species found in the Neotropics; tropical moist or wet forests; 10–1,050 m.

STIFFTIA J.C. Mikan, Delect. Fl. Faunae Brasil. t. 1. 1820 (nom. cons.).



Stiffitia hatschbachii, photo by G.S. Siqueira.

Shrubs, trees or scrambling, tall lianas; stems cylindrical, not armed. Leaves alternate, petiolate; blades chartaceous or coriaceous, margin entire, pinnately nerved. Capitula in dense axillary cymes, few-headed apical clusters, or solitary; capitula discoid, homogamous. Involucre narrowly cylindrical to turbinate; involucre bracts few- to many-seriate, subimbricate to imbricate, usually with many smaller bracts grading down the pedicels; receptacle flat to slightly convex, glabrous. Capitula with 1–40 flowers, bisexual; corolla tubular, whitish to yellow or orangish yellow, lobes linear, tightly coiled; apical anther

appendage oblong to lanceolate, basal anther appendage long-caudate, short-papillate or lacinate; style base lacking basal node, glabrous, shaft glabrous, style branches short, divergent, rounded to acute, glabrous. Cypselae cylindrical, glabrous or sparsely setulose; carpodium annular to short-cylindrical; pappus setae 4–5-seriate, persistent, prominent, often brightly colored (orange, pin or whitish).

Distinctive features: Scrambling lianas with capitula arranged in axillary thyse-like or corymbiform clusters; corolla with tightly coiled lobes; basal anther appendages long-caudate; and well-developed, multiseriate, colored pappus.

Distribution: A South American genus of six species, found in Brazil and French Guiana. Two Brazilian species, *S. uniflora* Ducke (Amazonas, Pará and Amapá) and *S. hatschbachii* H. Rob. (Espírito Santo) are scrambling lianas; rainforests; 40–135 m.

TILESIA G. Meyer, Prim. Fl. Esseq. 251. 1818.

Shrubs or scrambling herbs, shrubs or lianas; stems quadrangular, becoming cylindrical



Tilesia baccata, photo by P. Acevedo.

with age, and reaching 2.5 to >10 m long; cross section with regular anatomy, rays numerous and conspicuous, apparently with shallow phloem wedges. Leaves opposite, petiolate; blades lanceolate to ovate, apex acute to acuminate, margins serrate, scabrous, eglandular,

venation pinnate to palmately 3-5-veined. Synflorescence terminal or axillary in corymbiform or

subumbellate groups of 3(–7) capitula or capitulum solitary; peduncles typically stout, pubescent; capitula radiate, heterogamous. Involucre hemispherical; involucre bracts in 2–3 series; receptacle convex, paleaceous, paleas obovate, stoutly acuminate to apiculate, rigid, conduplicate, weakly keeled, strongly striate, glabrous or finely strigillose apically, protruding in fruit. Ray flowers (when present) sterile; corolla liguliform, yellow, yellow-orange or reddish orange. Disc flowers bisexual; corolla tubular yellow; anthers black, apical connective appendage ovate with glandular trichomes; style branches tapered. Cypselae obpyriform to obconic, green to black, glabrous, fat and baccate (surface fleshy) at maturity; pappus absent.

Distinctive features: Scrambling lianas, with leaf blades lanceolate to ovate, apex acute to acuminate at apex, serrate, scabrous, and eglandular; ray flowers sterile; cypselae baccate embraced by conduplicate orange paleas; and pappus absent.

Distribution: A neotropical genus of three species, distributed from Costa Rica south to southern Brazil, and Cuba and Hispaniola. Two species, i.e., *T. baccata* (L.) Pruski, and *T. macrocephala* (H. Rob.) Pruski, grow as scrambling lianas; humid forest margins; 0–900 (–1,600) m.

TREPADONIA H. Robinson, Proc. Biol. Soc. Washington 107: 565. 1994.

Scrambling vines, hairs mostly symmetrically T-shaped; stems nearly cylindrical, striate, reaching 8–10 m in length. Leaves alternate or opposite, petiolate; blades simple, acuminate at apex, rounded or obtuse at base, margins entire, pinnately veined. Synflorescence pyramidal thyrsoid; capitula discoid, homogamous. Involucre campanulate; involucre bracts 25–28 in 3–5



Trepadonia oppositifolia, photo by J.G. Graham.

series, receptacle epaleaceous.
Capitula 8–23-flowered; corolla
tubular, purple, glabrous; anther
bases obtuse, calcarate; style
branches with sweeping hairs
acicular, style base with node.
Cypselae 10-ribbed, with scattered
setae; pappus biseriate, inner
bristles long, whitish,
subpersistent, the outer

squamellate.

Distinctive features: Scrambling vines; leaves with acuminate apex, pinnately veined, upper surface glabrous; synflorescence pyramidal thyrsoid; capitula 8–23-flowered; style with node; and cypselae 10-ribbed.

Distribution: A Peruvian genus of two species (*T. oppositifolia* H. Rob. & H. Beltrán and *T. mexiae* (H. Rob.) H. Rob.); moist, mixed forests; ~700 m.

TRIXIS P. Browne, Civ. Nat. Hist. Jamaica 312. 1756.

Erect or scrambling shrubs, few m long, with hanging branches; stems sometimes winged. Leaves alternate, petiolate or sessile (sometimes auriculate or decurrent); blades simple, narrowly lanceolate to ovate, usually acute to acuminate at apex, with entire to dentate margins, pinnately veined, glabrous or tomentose on abaxial surface. Synflorescence terminal, corymbiform, paniculiform, or racemiform; capitula bilabiate, homogamous. Involucre



Trixis antimenorrhoea, photo by P. Acevedo.

cylindrical (rarely subhemispherical); involucre bracts 5–13, graduate to subequal, 1–5-seriate, acute at apex (reflexed in fruit); receptacles flat, epaleaceous, pilose to densely long pubescent. Capitula with flowers 4–60, bisexual; corolla bilabiate, outer lip 3-dentate, inner lip deeply 2-lobed, usually yellowish (less commonly white or rarely orangish); apical anther appendage elongate, lanceolate to oblong, usually acute, anther bases sagittate; style branches continuous, truncate at apex, with a crown of sweeping hairs. Cypselae cylindrical to fusiform, mostly substrate, usually 5-ribbed, pubescent; pappus 1–3-seriate, composed of many subequal,

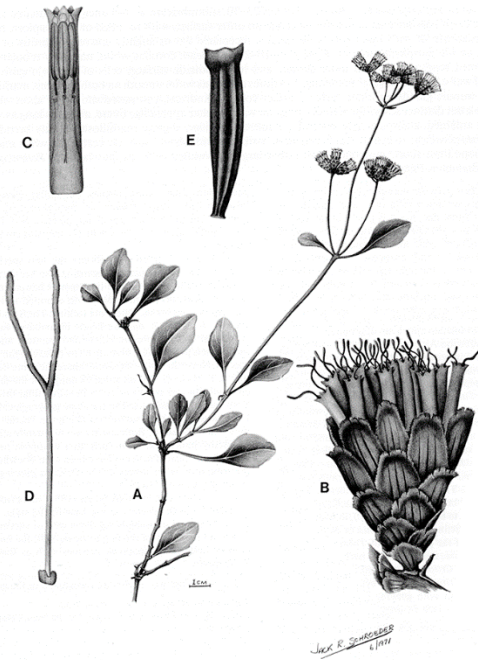
barbellate, capillary bristles.

Distinctive features: Scrambling vines; leaves alternate, with pinnate venation; receptacle pilose to densely long pubescent; capitula bilabiate; and style branches truncate at apex, with a crown of sweeping hairs.

Distribution: A New World genus of 40–45 species, six of which are scrambling shrubs or vines that are distributed from Mexico to southern Brazil and Hispaniola in the Antilles; open vegetation, dry or wet forests, hills on limestone substrate, and dry costal thickets; 8–1,200 m.

TUBEROSTYLIS Steetz, Bot. Voyage Herald 142. 1853.

Slender, root-climbing vines, 5–6 m long, sometimes with many short, lateral branches.



Tuberostylis rhizophorae, drawing by Jack R. Schroeder.

Leaves opposite, petioled; blades slightly fleshy, glabrous, obovate to elliptical, entire to crenulate, obtuse to short acuminate, triplinerved. Synflorescences terminal on lateral branches, ascending or sessile, paniculate, or in axillary fascicles; capitula discoid, homogamous. Involucral bracts 25–30, subimbricate, 4–5-seriate, unequal, gradate, spreading at maturity or inner caducous; receptacle flat or slightly convex, glabrous or with narrow paleas inside marginal flowers.

Capitula 10–20-flowered, bisexual; corolla tubular, white, slightly thickened base, glabrous on inner

surface and lower outside surface, lobes 1–3 times as long as wide, smooth, mammillate at tips, a few minute glands on outer surface; anther collar cylindrical; style base not enlarged, glabrous, style branches narrowly linear, slightly mammillate, slightly broadened distally. Cypselae prismatic to cylindrical, 5-ribbed, whitish and strongly corticated when mature, glabrous; carpodium short, indistinct; pappus absent.

Distinctive features: Slender, root-climbing vines with slightly fleshy, opposite, simple, triplinerved leaves; pappus absent.

Distribution: A genus of two species distributed in Colombia, Ecuador, and Panama; mangrove swamps and saline tidal thickets; 0–10 m.

TUXTLA Villaseñor & Strother, Syst. Bot. 14: 537. 1989.



Tuxtila pittieri, from G. Ibarra 2375 (ASU).

Scrambling lianas; stems hexagonal when young, cylindrical when old; bark corky; cross section with regular anatomy, medulla hollow, xylem with shallow phloem wedges at the periphery (Ibarra-Manríquez et al 2015). Leaves opposite, petiolate; blades coriaceous, elliptic, denticulate, with 3–5, main acrodromous veins. Synflorescence terminal, corymbiform-paniculate; capitula radiate, heterogamous. Involucre campanulate to cylindrical; involucre bracts 18–22 in 3–4 series; receptacles convex, paleaceous, palea naviculate. Ray

flowers 5–15, pistillate; corolla liguliform, pale yellow to yellowish white, margins folded adaxially. Disc flowers 20–40+, bisexual; corolla tubular, pale yellow to yellowish white; anthers brown or blackish, apical anther appendages with minute glandular trichomes extending to distal parts of connective, base slightly sagittate; style branches hispidulous-papillate at the acute to attenuate tips. Ray cypselae triquetrous, brown or black with stramineous wings, glabrous; disc cypselae compressed, biconvex, otherwise as ray cypselae; pappus of 2–4, stout, erect or slightly recurved awns continuous with the wing and body of cypsela.

Distinctive features: Scrambling lianas; leaves opposite, venation acrodromous; receptacle paleaceous, lamina of ray corollas involute; and edges of pappus awns minutely lacerate or ciliate.

Distribution: A genus of a single species, *T. pittieri* (Greenm.) Villaseñor & Strother; from the Caribbean lowlands of Costa Rica and lowlands in Veracruz, Mexico; ~200 m.

ULEOPHYTUM Hieronymus, Verh. Bot. Vereins Prov. Brandenburg 48: 198. 1906.

Scrambling (?) woody vines; stems cylindrical, striate. Leaves opposite, short-petiolate; blades subcoriaceous, broadly oblong to ovate, minutely denticulate, apex acuminate, triplinerved from base. Synflorescence of numerous capitula clustered in axils of leaves; capitula discoid, homogamous. Involucre campanulate; involucre bracts ~25, scarious, imbricate, 3–4-seriate, unequal, gradate, mostly persistent; receptacle flat, glabrous. Capitula 55–60-flowered, bisexual; corolla tubular, glabrous on inner and lower outside surfaces, lobes slightly longer than wide, smooth, with numerous glands clustered on outer surface; apical anther appendage large, ovate to oblong, longer than wide, with slightly retuse tip; anther collar cylindrical; style base not enlarged, glabrous, style branches narrowly linear, nearly filiform below, slightly broadened distally, mammillate. Cypselae prismatic, 4–5-ribbed, glabrous except for few glands near the top; carpodium stopper-shaped; pappus setae uniseriate, ~30, closely contiguous, persistent.

Distinctive features: Scrambling (?) woody vines, with opposite, simple, triplinerved leaves; capitula densely clustered and sessile in leaf axils; apical anther appendage longer than wide; cypselae 5-ribbed; and pappus of bristles persistent.

Distribution: A genus of a single species, *U. scandens* Hieron., known only from the type collection from Loreto, Peru; ~1,200 m.

VERBESINA Linnaeus, Sp. Pl. 901. 1753 (nom. cons.).

Annual or perennial herbs, erect shrubs, rarely scrambling lianas, or trees; some lianas



Verbesina crocata, photo by P. Acevedo.

reaching 20–25 m in length; stems to ~2 cm in diam.

sometimes with corky bark; cross section terete, regular with numerous conspicuous rays and shallow phloem wedges (Figure 44F). Leaves opposite, rarely alternate, sometimes with decurrent winged petioles; blades entire or deeply dissected, serrulate, usually triplinerved.

Synflorescence paniculiform or corymbiform or solitary, terminal capitula, sometimes scapose; capitula discoid homogamous or radiate, heterogamous. Involucre cylindrical, turbinate, campanulate, hemispheric; receptacles flat to convex, rarely globose, paleaceous,

palea tapered, sometimes with rounded flat tips. Ray

flowers pistillate, sometimes sterile or neuter; corolla white, orange, red, yellow, greenish white, white-pink, purplish green. Disc flowers bisexual; corolla tubular, yellow, orange, red, green, white or purple; anthers brown or black, rarely red, pink or yellow, apical anther appendages with or without glandular trichomes; style branches long and tapered or with broadly acute or deltoid apices. Cypselae strongly compressed, sometimes ray cypselae triquetrous, broadly obovate, oblanceolate to narrowly cuneate, symmetrically or asymmetrically winged, stramineous to dark brown or blackish, sparsely pubescent distally, the wings thin to corky;

pappus of two awns, erect, rarely uncinatate, sometimes triquetrous; ray cypselae with 3 awns, or rarely absent.

Distinctive features: Scrambling lianas with opposite, pinnatifid or pinnately lobed leaves; stems winged; discoid heads and corolla orange to red; cypselae compressed, winged; and pappus usually two-edged, erect.

Distribution: A New World genus with ~300 species, with centers of diversity in Mexico and the Andes. Only three species, *V. crocata* (Cav.) Less., *V. fraseri* Hemsl. and *V. lottiana* Turner & Olson, are known as lianas; scrubs, cultivated and disturbed areas; 700–1,800 m.

VERNONANTHURA H. Robinson, *Phytologia* 73: 66. 1992.

Subshrubs or small trees, rarely scrambling lianas, sometimes xylopodial; hairs simple or



Vernonanthura buxifolia, photo by P. Acevedo.

T-shaped. Leaves alternate, sessile to long petiolate; blades elliptic, lanceolate, ovate, apex obtuse or acute, margins entire or serrate, base obtuse, attenuate, truncate, rarely cordate or auriculate, pinnately veined.

Synflorescence thyrseoid;

capitula sessile to short

pedunculate; capitula discoid, homogamous. Involucre cylindrical to campanulate; involucre bracts 6–30(–60), imbricate in 4–10 series. Capitula 4–45-flowered; corolla tubular, whitish to

lavender, with only glandular trichomes; apical anther appendages often with glands or hairs, anther bases sagittate; style with node, style branches with sweeping hairs, short-acute. Cypselae 8–10-ribbed, glabrous or setiferous and glandular trichomes; pappus biseriate, capillary, outer squamellate.

Distinctive features: Scrambling liana with simple, alternate, serrate leaves; capitula sessile in paniculiform synflorescence, with cymose or corymbose branches; and corolla with glandular trichomes.

Distribution: A genus of 77 species, distributed from southern Mexico to central Argentina, with numerous species in SE Brazil. Only five species, *V. buxifolia* (Less.) H. Rob., *V. fuertesii* (Urb.) H. Rob. from Dominican Republic, *V. cocleana* (S.C. Keeley) H. Rob. from Panama, *V. oaxacana* (Klatt) H. Rob. from Mexico, and *V. patens* (Kunth) H. Rob. from Colombia, are known as climbers; wide range of vegetation, savannas, dry forest, and humid to wet forest; 100–2,240 m.

WEDELIA Jacquin, Enum. Syst. Pl. 8, 28. 1760 (nom. cons.).

Aspilia Thouars (1806).

Erect to spreading, sometimes vine-like, basally woody perennials or shrubs. Stems terete or obtusely angular. Leaves opposite, petioled or sessile, petioles winged or not; blades usually coriaceous, ovate lanceolate (rarely obscurely 3-lobed), 2–5(–10) cm long., basally rounded to cuneate, apically acute, margins subentire to coarsely toothed, abaxial surfaces strigose, the adaxial surfaces scabrous, triplinerved above the base. Capitula terminal and axillary, radiate, heterogamous, solitary or 2–3, pedunculate. Involucre campanulate; involucre bracts 8–12, outer lanceolate sometimes obscurely 3-lobed, rounded at base, usually with purplish nerves,

harshly strigose-hispid, the inner bracts usually shorter, more membranous, obtuse, scabrous; receptacle paleaceous, paleas stramineous with strong, purplish midrib, scarious to membranous. Ray flowers 5(–9), pistillate, corolla liguliform, pale to golden-yellow, tube 1.5–2 mm long. Disc flowers 15–25(–40+), bisexual, corolla tubular, yellow; style branches abruptly attenuate. Cypsela stramineous to grayish, sometimes the body blackish and the wings stramineous, the peripheral 3–4.5 mm long, triquetrous, (0–)2–3-winged, usually glabrous, the inner cypselae biconvex or weakly quadrate, (0–)2-winged, glabrous or minutely tuberculate and antrorsely hispidulous; rostrum erect, stout or slender; pappus an erose 0.3–0.5 mm high plus 0(–2) fragile bristles to 0.5–1.0 mm long.

Distinctive features: Scandent shrubs few meters long; leaves opposite, the blades strigose to scabrid; ray flowers pistillate, fertile; and cypselae winged, rostrate, with a coroniform-aristate pappus.

Distribution: A pantropical genus of 110 species (sensu Panero 2007), mostly occurring in the Americas. *Wedelia acapulcensis* var. *ramosissima* (Greenm.) Strother from eastern and southern Mexico south to Costa Rica (Strother 1991) and *W. paraensis* Huber from Brazil are the only two species reported as a scrambling vines; wet areas, pine savannas, seasonal evergreen forests, and "logwood swamps"; mostly below 500 m.

ZEXMENIA La Llave, Nov. Veg. 1: 13. 1824.

Erect herbs or scrambling vines; stems 1–5 m long. Leaves opposite, petiolate; blades ovate, elliptic to lanceolate, apically acute or acuminate to long-attenuate, margins serrate or denticulate, basally rounded to cuneate, both surfaces scabrous-hispid to pilose, obscurely triplinerved. Synflorescence of umbelliform or corymbiform clusters of 3–6 capitula; capitula

radiate, heterogamous. Involucres broadly campanulate to hemispheric; involucre bracts 15–30 in 2–3 series; receptacles convex, paleaceous, palea carinate-alate. Ray flowers 8–16 pistillate; corolla liguliform, yellow to orange. Disc flowers 20–100, bisexual; corolla tubular yellow to orange; anthers dark brown or blackish, apical anther appendages ovate with a few glandular trichomes; style branches tapered, apices hispidulous. Cypselae compressed, those of the rays triquetrous, oblanceolate to narrowly cuneate, stramineous to dark brown or blackish, sparsely pubescent distally, with symmetrical thin to corky wings, elaiosome absent; pappus on a distinct rostrum or neck, of 2–3 unequal awns plus 4–10, minute awns often connate to form a lacerate cup.

Distinctive features: Scrambling vines; synflorescence umbelliform or corymbiform of clusters with 3–6 capitula; cypselae compressed or flattened, usually symmetrically winged, elaiosome absent; and pappus borne on a distinct rostrum or neck.

Distribution: A genus of three species, *Z. serrata* Llave and *Z. virgulta* Klatt are reported as scrambling vines 1–5(–7) m long; southern Mexico and Central America; ruderal areas and in wet tropical or pine forests; 30–1,000 (–2,000) m.

EXCLUDED TAXA.

The genus *Antillanthus* B. Nord., although described as containing climbing species, is not treated in this work because none of the collections examined by us of any species exhibited the climbing habit. If the climbing habit is actually present in this genus, it is only sporadic or accidental in overcrowded, shaded situations.