

# CUCURBITACEAE

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A Pantropical family which originated in Asia in the Late Cretaceous (Schaefer et al. 2009). Cucurbitaceae currently comprises 95 genera and ~1,000 species of lianas or herbaceous annual vines and trailers (very rarely shrubs or trees). Of these, 33 genera and ~377 species are native to the Neotropics, an additional 4 Old World genera (7 species) have been introduced, some of which have become naturalized or invasive. In diverse habitats, some common in moist or wet lowland forests, 0–2,500 (–3,700) m elevation. Recent molecular studies place Cucurbitaceae in a polytomy with Begoniaceae, Datisceae, and Tetramelaceae (Schaefer & Renner 2011a), with which they share inferior ovaries and parietal placentation.

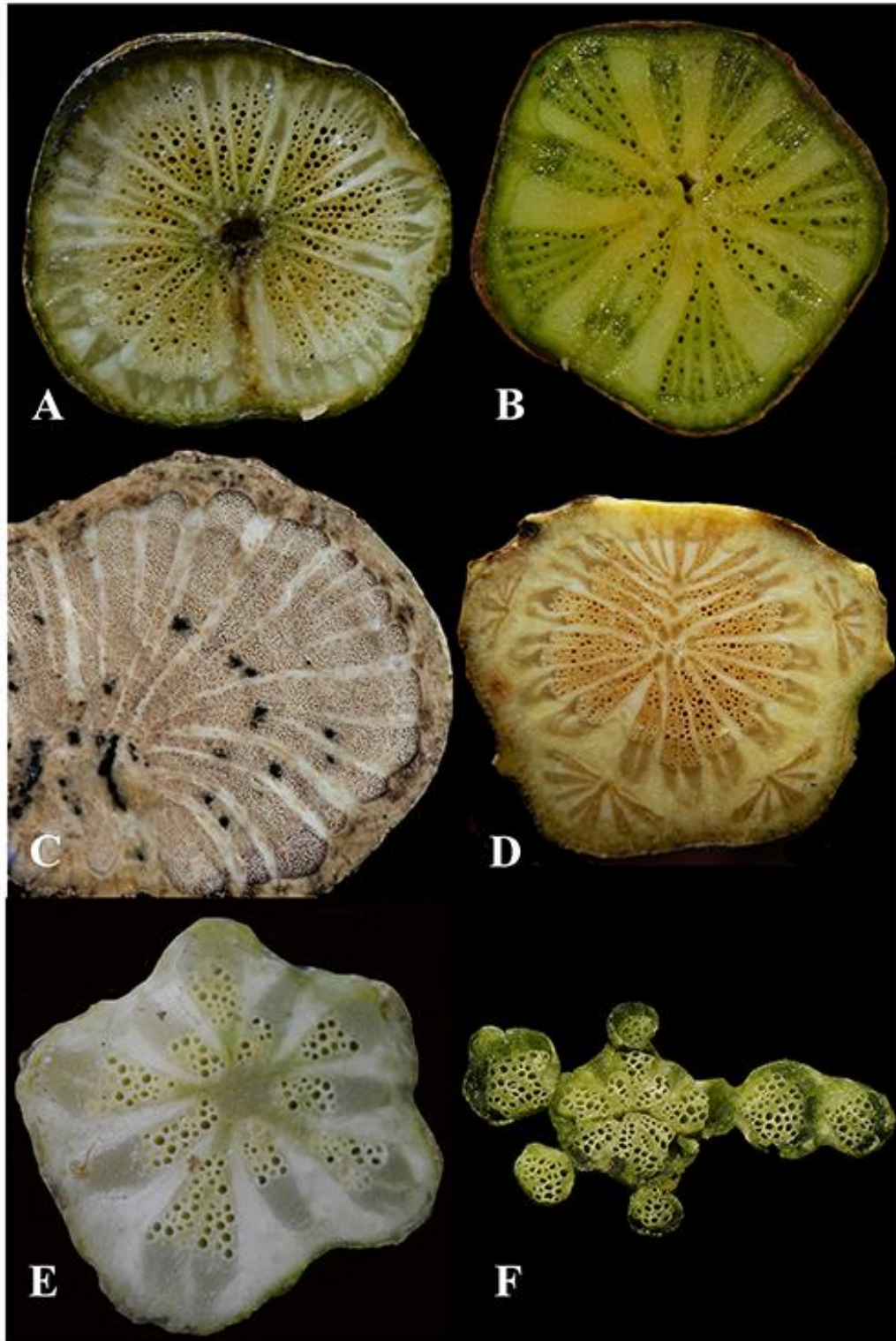
**Diagnosics:** Cucurbitaceae are mostly perennial lianas or herbaceous annual vines or trailers, often glandular-hairy and usually with one tendril per node inserted at a 90° angle with the petiole (Figure 95A, B). Perennial species often have tuberous roots or pachypodia. Most Cucurbitaceae contain oxygenated tetracyclic triterpenoids (cucurbitacins) with bitter taste and purging or abortive effect. Often confused with Passifloraceae or Vitaceae, because they share occurrence of alternate leaves and tendrils, but differentiated by the tendrils inserted at a 90° angle with the petiole, while in Passifloraceae these are axillary, and in Vitaceae they are opposite to the leaves.

## General Characters

1. **STEMS.** Woody, fleshy or herbaceous, glabrous or variously pubescent, flexible or less often slightly rigid, angulate, terete, lobed, sometimes slightly flattened or furrowed. Barks smooth and thin, corky or rough (Figure 94C, D). Cross sections of mature stems with axial vascular elements divided in radial segments by broad rays (Figures 93A–E; 94A, B), some species

with neoformed vascular cylinders (Figure 93D), and *Fevillea cordifolia* has phloem wedges with discontinuous cambium (Figure 93B).

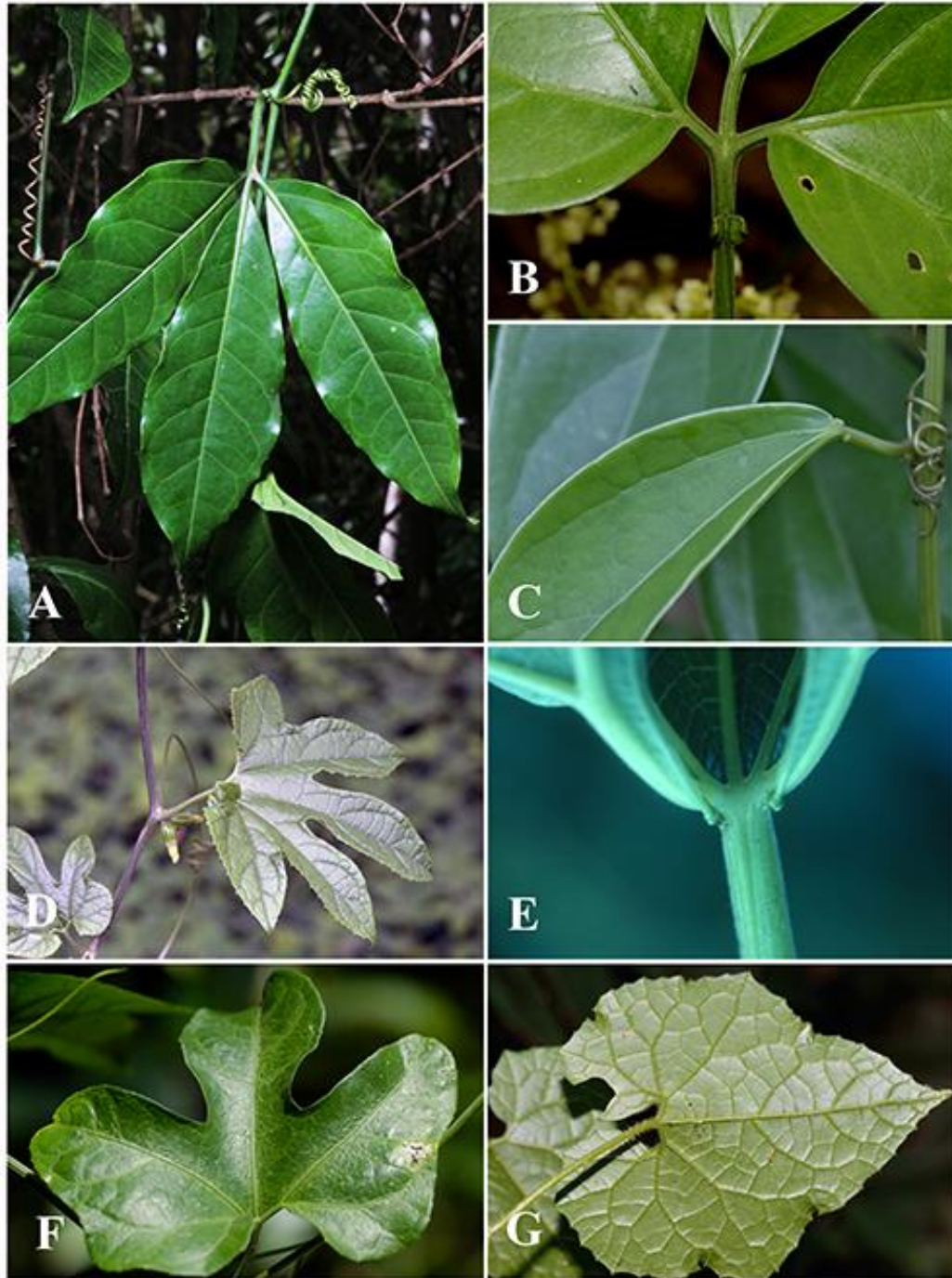
2. EXUDATES. Plenty of watery and sometimes mucilaginous exudate is produced upon injury. The sap is usually bitter due to poisonous Cucurbitacins.
3. CLIMBING MECHANISMS. One tendril (modified shoots) per node inserted at a 90° angle with the petiole, these simple or branched (Figure 96), uncoiled below the branching point (Figure 96A, C) or less often coiling above and below the branching point, i.e., zanonoid (e.g., *Siolmatra*, Figure 96B). In very few species (*Melothria campestris* (Naud.) H. Schaeff. & S.S. Renner), cultivars of *Cucurbita pepo* L.) tendrils are absent.
4. LEAVES. Alternate, spiraled, membranaceous or succulent, mostly simple and entire or serrate (teeth sometimes glandular secretory), less often palmately or pedately lobed, or palmati- or pedati-compound (Figure 95), often glandular-hairy or hispid; petioles often as long as the blade and sometimes with a pair of glands above the distal half (Figure 95B, C, E).
5. STIPULES AND STIPELS. Absent.



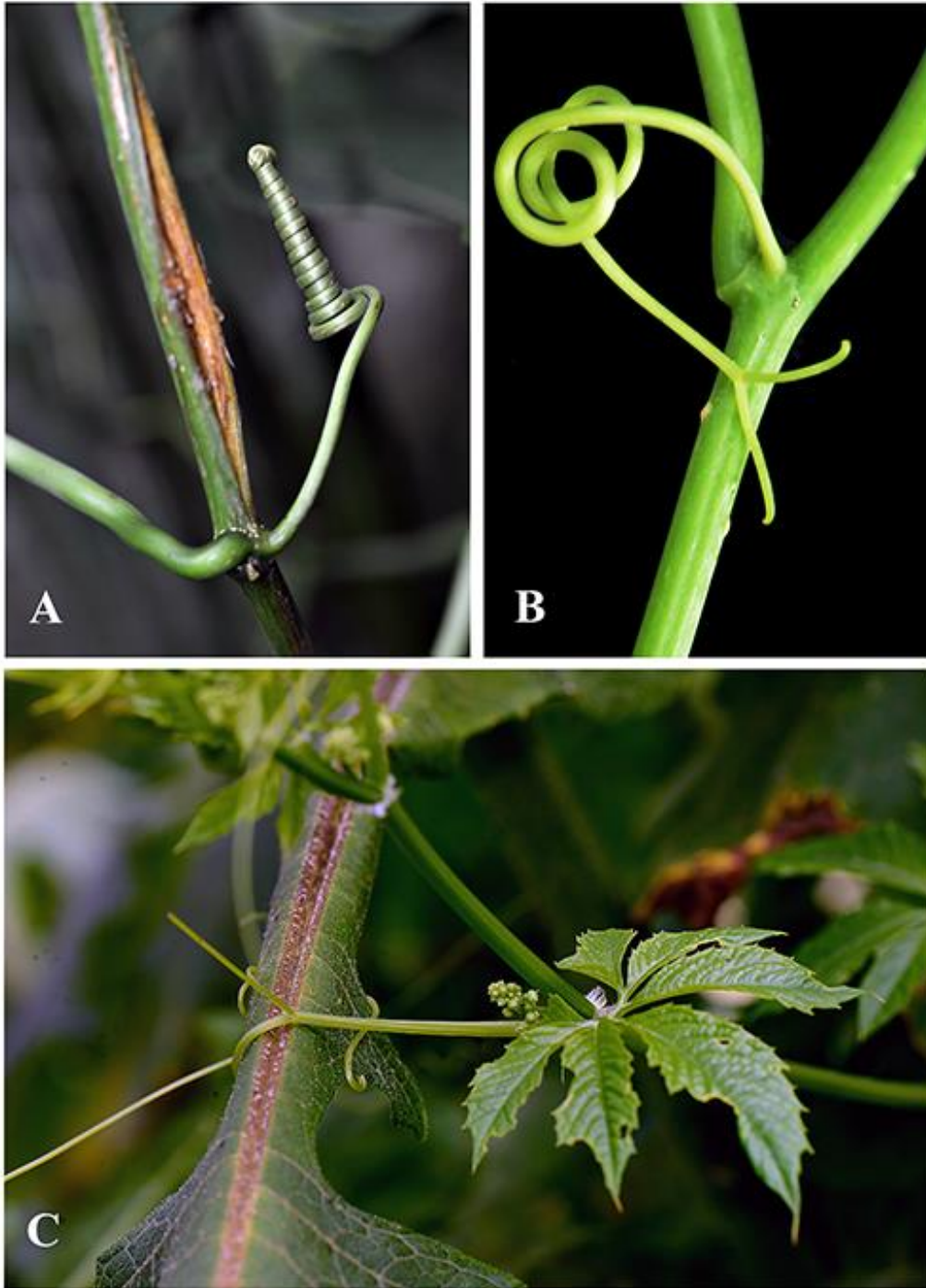
**Figure 93.** Stem cross sections in climbing Cucurbitaceae with axial vascular elements divided in radial segments. **A.** *Cayaponia* sp. **B.** *Coccinia grandis*. **C.** Cucurbitaceae indet. **D.** *Cayaponia* sp. **E.** *Hanburia mexicana*. **F.** *Momordica charantia*, stems with neof ormations of vascular cylinders. Photos by P. Acevedo.



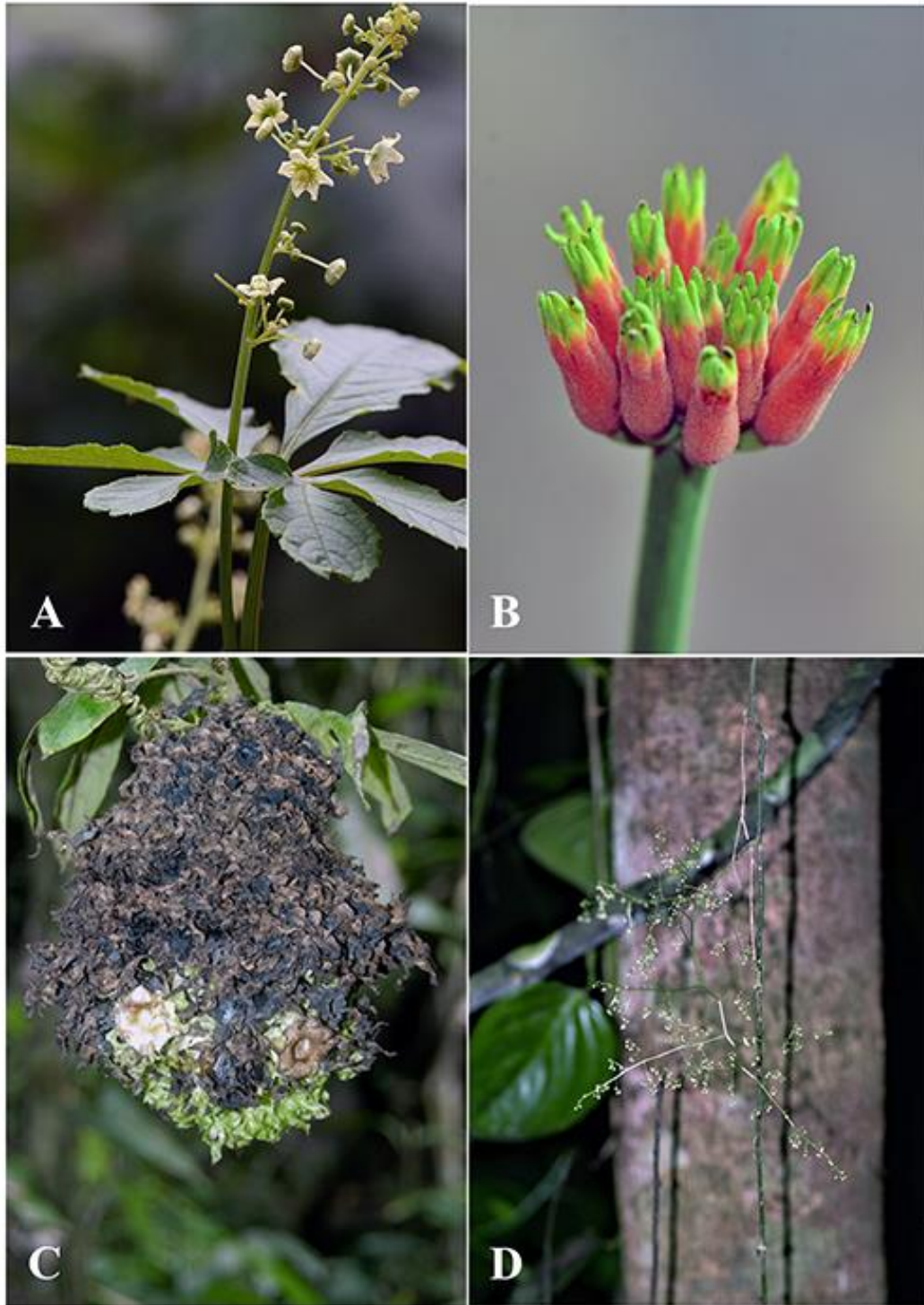
**Figure 94.** Stems in climbing Cucurbitaceae. **A.** *Psiguria* sp., with wide multiseriate rays. **B.** *Fevillea cordifolia*, with phloem wedges. **C.** Cucurbitaceae indet. with rough bark. **D.** *Gurania* sp., with furrowed stems. Photos by P. Acevedo.



**Figure 95.** Leaves in climbing Cucurbitaceae. **A.** *Psiguria pedata* with trifoliolate leaves. **B.** *Fevillea pedatifolia*, with trifoliolate leaves. **C.** *Anisosperma passiflora*, leaves simple. **D.** *Wilbrandia* sp. leaves 5-lobed. **E.** *Lagenaria siceraria* leaves with prominent glands at the junction with petiole. **F.** *Gurania* sp. with trilobed leaves. **G.** *Melothria sphaerocarpa*, leaves lobed, dentate. Photos: A by Jonathan Amith; B–G by P. Acevedo.



**Figure 96.** Tendrils in Cucurbitaceae. **A.** Cucurbitaceae indet, showing simple, coiled tendrils. **B.** *Siolmatra* sp. with bifid zanonoid tendril (coiling below branching point). **C.** *Cyclanthera langaei*, with multifid tendrils uncoiled below branching point. Photos by P. Acevedo.



**Figure 97.** Inflorescences in climbing Cucurbitaceae. **A.** *Cyclanthera langaei*, erect, racemiform thyrsus. **B.** *Gurania lobata*, erect capitulate inflorescence. **C.** *Cayaponia ophthalmica*, hanging capitulate inflorescence. **D.** *Sicydium* sp. with long hanging, paniculate inflorescences. Photos by P. Acevedo.



**Figure 98.** Fruits in climbing Cucurbitaceae. **A.** *Cucumis anguria*, indehiscent, fleshy pepo. **B.** *Cucurbita okechobeensis*, indehiscent fleshy pepo. **C.** *Fevillea cordifolia*, dehiscent along a large circular calyx scar (zonate). **D.** *Luffa aegyptiaca*, operculate capsule. **E.** *Luffa aegyptiaca*, with fibrous mesocarp. **F.** *Momordica charantia*, dehiscent capsule, seeds arillate. **G.** *Sicyos edulis*, indehiscent echinate pepo. Photos by P. Acevedo.



6. INFLORESCENCES. Racemes, thyrses, panicles, or fascicles, rarely spikes, umbels or capitula, mostly axillary, hanging or ascending (Figure 97A–D), sometimes cauliflorous, flowers sometimes solitary.
7. FLOWERS. Unisexual (plants dioecious or monoecious), actinomorphic, (3–)5 (6)-merous; the base of the calyx and the corolla forming a campanulate, crateriform or tubular receptacle tube or hypanthium with minute or small sepals, this receptacle tube sits above the ovary in pistillate flowers; corolla gamopetalous, tubular, campanulate or rotate with short to long lobes, or petals free to the base, which are entire, bilobed or fringed, white, yellow, orange, red or pink; stamens 3–5 alternipetalous, inserted at the base of calyx, filaments free or often joint or connate in two pairs, sometimes connate into a central column or head, anthers are mostly basifixed, longitudinally dehiscent; gynoecium of (1–) 3(–5) inferior carpels with parietal placentation (Figure 98A) with 1 to many ovules, the style 1–3, simple, short or long, the stigma entire, lobulate, or divided.
8. FRUITS. Soft- or hard-shelled berry (a pepo), smooth, warty or echinate (Figure 98A, B, F, G), less often a valvate or operculate capsule (Figure 98C, D), rarely samaras or achenes; many-seeded or rarely one-seeded (e.g., *Sicydium*, *Sicyos*, *Frantzia*).
9. SEEDS. Smooth, tuberculate, scrobiculate, sometimes with spongy outgrowth (*Apodanthera*) or hairs (e.g., species of *Melothria* and *Tecunumania*), usually flattened, those of fleshy fruits may be globose, ovoid, falcate, compressed (most genera), or even winged (*Siolmatra*), usually surrounded by an arillode jacket (Figure 98F) derived from the closest carpellary tissue around the ovule.

## USES

Numerous species of Cucurbitaceae have economic importance, usually as vegetables or fruits (e.g., cucumber, melon, bottle gourd, watermelon, pumpkin and zucchini), as a source of oils (e.g., *Fevillea*) or fibers (e.g., *Luffa*). The following genera have been introduced to the New World as crops: *Benincasa*, *Citrullus*, *Coccinia*, *Cucumis*, *Lagenaria*, *Luffa* (1 species introduced, 3 native), *Momordica*, and *Trichosanthes*, some of which have become naturalized in the Neotropics.

### Key to the genera of climbing Cucurbitaceae

1. Tendrils apically bifid, coiling above and below the branching point (zanoioid) .....2
1. Tendrils simple or bi- to multifid but coiling above branching point only .....7
2. Petioles with callus ring at base; fruit a nodding truncate capsule containing 3–6 prominently winged seeds ..... *Siolmatra*
2. Petioles without callus ring at base .....3
3. Leaves compound (3-palmate or 5-pedate), with paired glands at the distal end of the petiole; fruit a subglobose pepo with c. 12 large, flattened seeds with a very narrow wing-like margin ..... *Fevillea pedatifolia*
3. Leaves simple, entire to deeply lobed .....4
4. Fruit a winged samara or berry with a single seed .....5
4. Fruit a dry capsule or pepo with many seeds .....6
5. Fruit a large, fibrous samara with continuous, encircling wing or small, compressed, membranaceous, with two lateral wings ..... *Pteropepon*
5. Fruit a fleshy, globose berry or achene, dark purple-black or black when ripe, 1–1.5 cm across ..... *Sicydium*

6. Leaves entire, narrowly ovate; fruit ovoid to oblong, not zonate, short apiculate at apex .....	<i>Anisosperma</i>
6. Leaves entire to ± deeply lobed or broadly cordate; fruit subglobose, zonate above the middle, rounded at apex .....	<i>Fevillea</i>
7. Tendrils simple, rarely a few bifid.....	8
7. Tendrils bi- to multifid.....	34
8. Tendrils with thickened base that persists as conical spur-like structure .....	9
8. Tendril base not persisting as conical structure .....	10
9. Receptacle tube 1–2 mm long.....	<i>Doyerea</i>
9. Receptacle tube 3–9 mm long.....	<i>Apodanthera</i> (sect. <i>Pseudoapodanthera</i> )
10. Receptacle tube bright orange to red or yellow (yellowish green), longer than corolla .....	<i>Gurania</i>
10. Receptacle tube green, usually much shorter than corolla.....	11
11. Corolla lobes fimbriate, or distinctly bifid at apex with coiled lobes.....	12
11. Corolla lobes entire or slightly bifid at apex without coiled lobes .....	13
12. Corolla lobes long-fimbriate along margins; endemic to Hispaniola (compare also the cultivated <i>Trichosanthes cucumerina</i> ) .....	<i>Linnaeosicyos</i>
12. Corolla lobes bifid on distal half, lobes coiled .....	<i>Ceratosanthes</i>
13. Corolla red, orange or pink.....	<i>Psiguria</i>
13. Corolla white, cream, yellow or greenish .....	14
14. Fruit opening explosively, by operculum or splitting.....	15
14. Fruit indehiscent.....	17
15. Fruit operculate, usually long-spiny .....	<i>Echinopepon</i>

15. Fruit opening explosively or by splitting, spiny, warty or smooth .....16
16. Fruit splitting into three valves, exposing seeds in scarlet red pulp ..... *Momordica*
16. Fruit opening explosively, exposing seeds in white tissue ..... *Cyclanthera*
17. One seed per fruit.....18
17. Seeds several to many .....20
18. Fruit a large, fibrous samara with continuous, encircling wing or small, compressed,  
membranaceous ..... *Pteropepon*
18. Fruit unwinged or (in some species of *Sicyos*) winged but not laterally compressed .....19
19. Fruit a fleshy globose berry or achene, glabrous, dark purple-black or black when ripe  
..... *Sicydium*
19. Fruit dry or fleshy, globose, ovoid, obovoid, pear-shaped, fusiform, winged, or 3–4-angled,  
glabrous or villous, sometimes armed with retrorse barbs, green or brown when ripe... *Sicyos*
20. Annual herbs with thin roots; flowers yellow .....21
20. Perennial plants, often with thick woody rootstock and trunk-like base; flowers yellow, white  
or greenish .....23
21. Fruits relatively small (1.5–7 cm long) or up to 20 cm wide in *M. sphaerocarpa*; anther  
thecae straight, fringed with hairs ..... *Melothria*
21. Fruits medium-sized to very large; anther thecae glabrous .....22
22. Young stems, calyx and ovary villous; corolla rotate or broadly campanulate; fruit smooth,  
globular to ellipsoid, large (e.g., watermelon) ..... *Citrullus*
22. Young stems and calyx +/- setose or scabrid; corolla campanulate; fruit smooth, setose or  
tuberculate, globular to ellipsoid, medium-sized to large ..... *Cucumis*
23. Fruit 7–15 cm long; seeds compressed, (sub)orbicular, 3.5–6 cm in diam., 1.5–2 cm thick...24

23. Fruit and seeds smaller [but compare <i>Cionosicya</i> (33)].....	25
24. Leaves entire, narrowly ovate; fruit ovoid to oblong, not zonate, short apiculate at apex .....	<i>Anisosperma</i>
24. Leaves entire to ± deeply lobed or broadly cordate; fruit subglobose, zonate above the middle, rounded at apex .....	<i>Fevillea</i>
25. Corolla rotate (sometimes +/- tubular in the lower half), lobes often slightly bifid .....	26
25. Corolla tubular or funnel-shaped with very short free, ± acute lobes.....	31
26. Fruit an ovoid-conical berry, ~2 cm long, sessile in the leaf axils, rostrate .....	<i>Wilbrandia</i>
26. Fruit pedicellate .....	27
27. Fruits in pendulous racemes.....	<i>Helmontia</i>
27. Fruit solitary .....	28
28. Anther thecae fringed with hairs.....	<i>Melothria</i>
28. Anther thecae glabrous .....	29
29. Ovary with 2 carpels, stigma bilobed, fleshy.....	<i>Melothrianthus</i>
29. Ovary with 3–5 carpels, stigma with 3–5 bifid branches.....	30
30. Style columnar with 5 bifid stigmata; fruit a smooth, ± globular green berry with lines of white dots; seeds in green arillode .....	<i>Cucurbitella</i>
30. Style columnar with 3–5 stigmata; fruit a smooth, ± globular or fusiform berry, ripening orange to scarlet red, often with white lines or dotted lines; seeds in red arillode ....	<i>Ibervillea</i>
31. Corolla tubular .....	32
31. Corolla funnel-shaped.....	33
32. Corolla orange-yellow; leaves simple, with triangular outline, 3–5-lobed; endemic to Hispaniola.....	<i>Penelopeia suburceolata</i>

32. Corolla greenish white; leaves 3–5-foliolate with narrowly linear leaflets .....	<i>Cayaponia espelina</i>
33. Corolla snow-white to yellowish; leaves with dentate glandular margin; medium-sized soft-shelled berries with small black seeds.....	<i>Coccinia</i>
33. Corolla large, greenish white; leaves eglandular; large ovoid hard-shelled fruits containing large elliptic dark brown or black seeds .....	<i>Cionosicyos</i>
34. Tendrils mostly 2-fid.....	35
34. Tendrils 3–7-fid .....	45
35. Corolla lobes yellow, inside with dark central spot.....	<i>Schizocarpum</i>
35. Corolla yellow, white, cream or greenish white, without a dark spot at the base.....	36
36. Fruit operculate or explosively dehiscent .....	37
36. Fruit indehiscent.....	40
37. Fruit operculate .....	38
37. Fruit explosively dehiscent .....	39
38. Corolla yellow.....	<i>Luffa</i>
38. Corolla white or cream.....	<i>Echinopepon</i>
39. Fruit with few large circular seeds in spongy pulp .....	<i>Hanburia</i>
39. Fruit with few to many, small, compressed, angled, 2-lobed at apex and base, often ± turtle-shaped seeds with crustaceous and verrucose testa.....	<i>Cyclanthera</i>
40. Annual herb with thin roots; corolla yellow; cultivated vegetable .....	41
40. Perennial plants, often with thick woody rootstock and trunk-like base .....	42
41. Ovaries and young stems +/- glabrous (pumpkin, squash).....	<i>Cucurbita</i>
41. Ovaries and young stems hispid to villous (watermelon).....	<i>Citrullus</i>

42. Corolla large, campanulate; seeds pale yellowish brown with densely appressed hairy testa .....	<i>Tecunumania</i>
42. Corolla smaller, rotate or tubular; seeds glabrous .....	43
43. Corolla rotate .....	<i>Apodanthera</i>
43. Corolla tubular .....	44
44. Fruit globose, smooth, 5–7 cm in diameter, ripening yellowish; seeds many, elliptical in fleshy pulp; endemic to Hispaniola .....	<i>Penelopeia sphaerica</i>
44. Fruits small, dry or fleshy, with firm, thin wall; seeds compressed, ovoid or ± triangular and apically tricornate in loose cellular pulp .....	<i>Cayaponia</i>
45. Fruit operculate, splitting into valves or opening explosively .....	46
45. Fruit indehiscent.....	49
46. Fruit operculate, many small seeds embedded in fibrous tissue; flowers yellow .....	<i>Luffa</i>
46. Fruit not operculate .....	47
47. Explosively dehiscent fruit with few large circular seeds in spongy pulp.....	<i>Hanburia</i>
47. Fruit splitting at maturity into several segments, seeds smaller .....	48
48. Pericarp splitting into three +/- regular carpellary segments; endemic to Mexico (Querétaro, Hidalgo, Puebla and Veracruz) .....	<i>Peponopsis</i>
48. Pericarp splitting into several irregular segments.....	<i>Polyclathra</i>
49. Receptacle-tube campanulate to urceolate, ± inflated; pedicel of male flowers to 30 cm long, to 15 cm in female ones.....	<i>Calycophysum</i>
49. Receptacle-tube not inflated; pedicels shorter .....	50
50. Annual herb with thin roots; corolla yellow; cultivated vegetables with very large globular to ellipsoid fruits.....	51

50. Perennial (or rarely annual) species with smaller fruits.....52
51. Ovaries and young shoots hispid to villous (watermelon).....*Citrullus*
51. Ovaries and young shoots +/- glabrous (pumpkin, squash).....*Cucurbita*
52. Corolla yellow, large, fleshy, campanulate; fruit a smooth, firm, often reddish brown pepo, globose, ellipsoid or cylindrical, up to 60 cm long ..... *Sicana*
52. Corolla white, yellow or greenish, rotate, small; fruit smaller, not a brown pepo .....53
53. Fruits 1–2.5 cm long, fleshy or hard, ellipsoid, or less often globose, indehiscent, smooth, thin-walled, ripening green, red, brown or black; usually many-seeded.....*Cayaponia*
53. Fruits 1-seeded, often much larger .....54
54. Fruits solitary, pear-shaped, to 20 cm long, or in most species much smaller and in dense capitula, fusiform, winged, or 3–4-angled, often villous or armed with retrorse barbs; receptacle-tube (broadly) campanulate, in some species with pouch-like nectaries at the base ..... *Sicyos*
54. Fruits solitary, pear-shaped, 3–6 cm long fleshy; receptacle-tube semi-globose, with ten pouch-like nectaries at the base, in some species with umbrella-like cover ..... *Frantzia*

**ANISOSPERMA** Silva Manso, Enum. Subst. Brazil. 38. 1836.

Dioecious (sometimes monoecious?), perennial vines; stems terete, woody, slender, reaching 3–4 m long; cross section with vascular tissue radially dissected by wide vessels (Schimper 1903). Leaves simple, ovate to broadly lanceolate, membranaceous, up to 13 cm long and 7.5 cm wide, acute at base and apex; petiole short, with two small auriculate glands at the junction with the blade. Tendrils apically bifid, coiling above and below branching point. Flowers small, 5-merous; pedicels longer than the flower, articulate on lower  $\frac{1}{3}$ ; male flowers in



condensed racemes; female flowers solitary or in groups of 2–4. Receptacle tube campanulate,



*Anisosperma passiflora*, photo by P. Acevedo.

green, glandular pubescent, with five tiny, acute sepals; corolla rotate, white or yellowish, the lobes lanceolate, connate on lower  $\frac{1}{4}$ ; stamens 5, anthers monothealous, filaments short, free. Fruit a fleshy, ovoid, ovoid-oblong, subtrigonous, late dehiscent capsule, short-apiculate at apex, 8–15 cm long, smooth or verrucose, opening by longitudinal splits. Seeds compressed, suborbicular, pale brown, 3.5 cm in diameter and 1.5 cm thick.

**Distinctive features:** Tendrilled vines or lianas; leaves simple, entire; petioles with a pair of auriculate glands at the junction

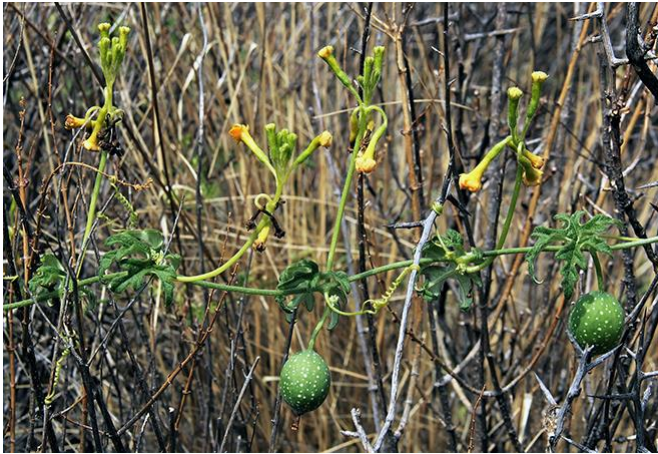
with the blade; small greenish white flower; and large ovoid-oblong, fleshy fruits containing large pale brown seeds.

**Distribution:** A single species, *A. passiflora* (Vell.) Silva Manso; in gallery and moist forests in coastal Brazil, from Bahia south to Santa Catarina; 0–1,000 m.

**APODANTHERA** Arnott, J. Bot. (Hooker) 3: 274. 1841.

*Guraniopsis* Cogn. (1908).

Monoecious, herbaceous climbing or trailing vines to 5 m long, with herbaceous or



*Apodanthera mandonii*, ♂ inflorescences and fruits, photo by E. Heim.

succulent stems that develop from a perennial rootstock (to 1 m long and 10 cm in diam.). Leaves simple, 5-foliolate or often 3–5(–9)-lobed, often with unpleasant odor, long-petiolate. Tendrils simple or 2-fid (rarely 3-fid), in some species with thickened base that persists as conical spur-like structure. Flowers small to large (up to

several cm across), 5-merous; male flowers in pedunculate racemes; female flowers solitary, rarely long-pedicellate. Receptacle-tube elongated, cylindrical, the sepals linear, subulate, shorter than the tube; corolla rotate, greenish white or yellow, petals free, obovate or oblanceolate; stamens 2–3, inserted on upper half of the tube, filaments short, free, anthers bitheous or one monotheous and two bitheous; ovary ovoid or cylindrical, with numerous, horizontal ovules, stigmata 3, U-shaped. Fruit fleshy, indehiscent, ovoid to ellipsoid, edible, ± rostrate, 1–7 cm long, ripening green, red or brown, often with white stripes or spots. Seeds few to many, ovate, compressed; testa smooth, brown, often with beige-white margin.

**Distinctive features:** Usually monoecious vines with unpleasant smell; fruits fleshy, indehiscent, ovoid to ellipsoid, ± rostrate, 1–7 cm long, ripening green or red to brown often with white stripes or spots, containing several ovoid, compressed brown seeds, often with ivory-white margin.

**Distribution:** A New World genus of 20 species with disjunct distribution with three species in Mexico and SW United States, (section Cucurbitopsis, probably better placed in its own genus),

and the remaining 17 in central and southern South America (Belgrano & Pozner 2012); open disturbed habitats, scrubs and Andean grasslands; 0–3,500 m.

**CALYCOPHYSUM** H. Karsten & Triana, Nuev. Jen. Esp. 20. 1855 [‘1854’].

Monoecious, herbaceous to woody vines, reaching 10–15 m long. Leaves simple, cordate,



*Calycophysum weberbaueri*, photo by D. Montesinos.

hastate, ovate-cordate, sometimes 3-, 5- or 7-lobed, with entire, undulate, serrate or minutely glandular dentate margins; petioles < than ½ as long as the blade.

Tendrils slender, 3–6-fid, with apical, adhesive pads. Flowers large, 5-merous, solitary, axillary, pendent, pollinated by bats;

peduncle of male flowers up to 30 cm in length, and up to 15 cm in female flowers. Receptacle-tube campanulate to urceolate, inflated, reticulate veined, sepals, large, ovate-lanceolate, as long as the tube; corolla rotate to tubular-campanulate, white or yellowish green, lobes as long or longer than the tube; stamens 3, inserted on upper half of the tube, filaments free, the anthers more or less free, two bitheous, one monothecous with duplicate thecae; ovary ellipsoid with three placentae and numerous horizontal ovules, style fleshy with three stigmata. Fruit an edible, ellipsoid pepo, smooth, green with dark green stripes, ripening yellow to orange. Seeds many, compressed, irregularly elliptical, arillate; testa dark brown, irregularly sculptured.

**Distinctive features:** Lianas or vines with 3–6-fid tendrils with adhesive pads; flowers large, solitary, pendent, bat-pollinated; peduncles 15–30 cm long.

**Distribution:** Four species in Andean cloud forests and lowland rainforest from Venezuela, Colombia, Ecuador to Peru and Bolivia; 200–2,000 m.

**CAYAPONIA** Silva Manso, Enum. Subst. Braz. 31. 1836 (nom. cons.).

*Selysia* Cogn. (1881); *Trianosperma* (Torr. & A. Gray) Mart. (1843).

Monoecious or dioecious, herbaceous or slightly woody vines, up to 20 m long. Stems



*Cayaponia racemosa*, photo by P. Acevedo.

angular or terete, sometimes swollen at nodes, reaching 3 cm in diam. in some species; cross sections in some species with axial vascular elements divided in radial segments by broad rays (Figure 93A).

Leaves simple, palmately 3–7-lobed, less

often 3–5-foliolate or entire, the blade often

decurrent on the petiole, and often with 2 disc-shaped glands at the base. Tendrils 2- to 7-fid

(simple in *C. espelina* (Silva Manso) Cogn.), sometimes with apical adhesive pads. Flowers

small, 5-merous, in racemes, panicles, pairs or solitary, male and female often coaxillary,

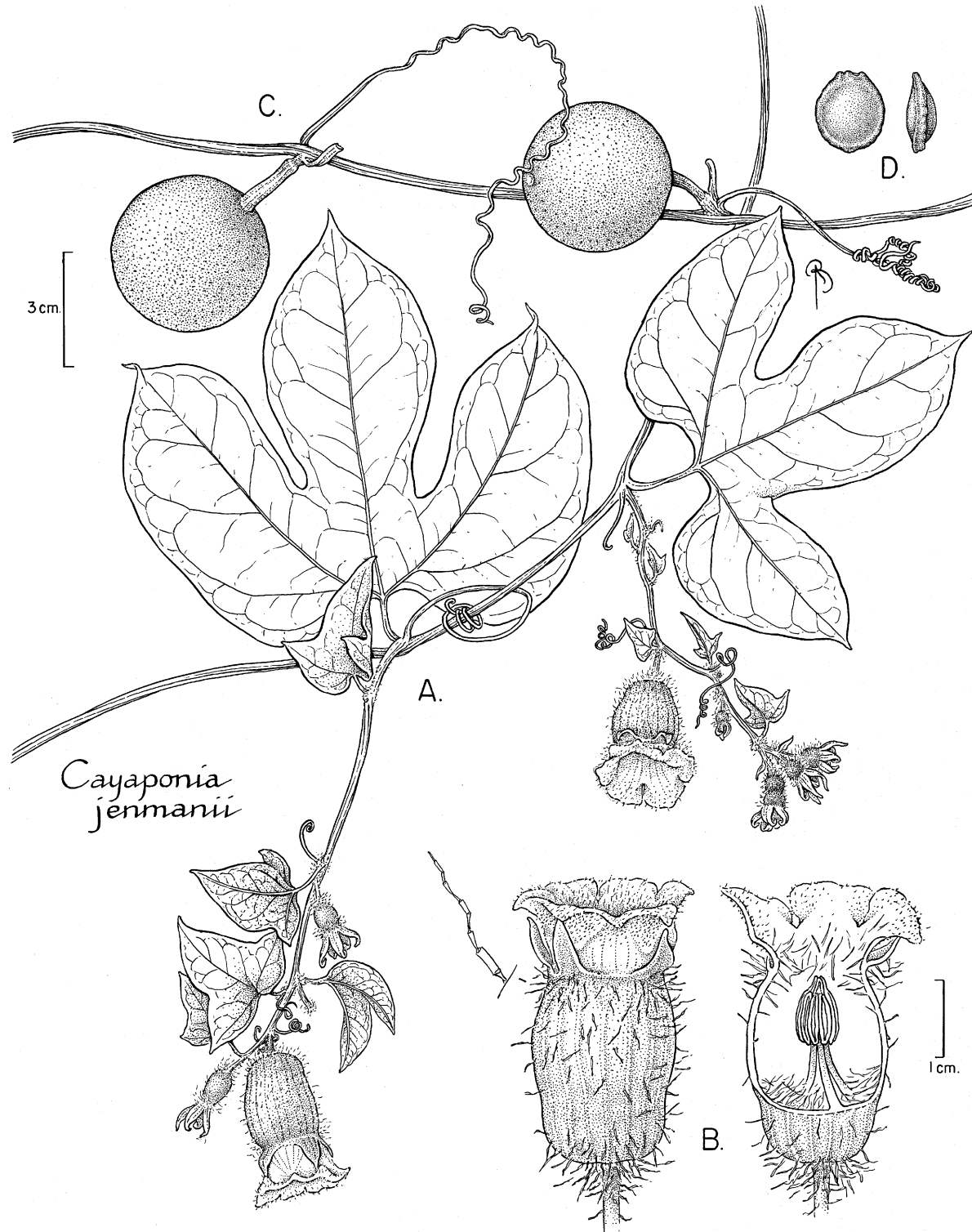
opening mostly at night. Receptacle tube shortly campanulate to cylindrical with minute sepals;

corolla tubular, yellow, white or light green, lobes as long as or shorter than the tube; stamens 3,

inserted near the base of the tube, filaments free, two anthers bithecal, one monothecous,

usually coherent in a head with duplicate or triplicate thecae; ovary globose, ovoid or oblong

with 1–3 placentae and 2–30 ascending ovules, nectary cupular, the style erect, linear with three



**Figure 99.** *Cayaponia jenmanii*. **A.** Flowering branch. **B.** Staminate flower, lateral view & longitudinal section. **C.** Stem with persistent fruits. **D.** Seed, frontal & lateral views. Drawing courtesy of Bobbi Angell.

dilated, reflexed, strongly papillose or smooth stigmata. Fruits small (1–2.5 cm long), fleshy or hard, ellipsoid, or less often globose, indehiscent, smooth, thin-walled, ripening green, red, brown or black, often with very bitter taste. Seeds 1–30, compressed, erect, irregularly ovate or oblong, triangular or dagger-shaped, truncate and apically tricornate, embedded in loose cellular pulp; testa brown, rigid and smooth, woody, without a distinct margin.

**Distinctive features:** Much-branched climber or trailer with 2- to 7-fid tendrils, small flowers and small, dry or fleshy, indehiscent fruits with firm, thin wall; seeds compressed, ovoid or  $\pm$  triangular and apically tricornate in loose cellular pulp.

**Distribution:** A tropical genus of ~75 species, one species in Africa, 66 in the Neotropics from Mexico to northern Argentina, with most species in South America; along forest margins, clearings, riverine and moist forests; 200–3,000 m.

**CERATOSANTHES** Adanson, Fam. Pl. 2: 139. 1763.

Dioecious or monoecious, herbaceous vines, 3 to 5 m long, with large tuberous rootstock.



*Ceratosanthes palmata*,  
♂ inflorescences, photo by P.

Leaves simple, ovate, pentagonal, reniform, or palmately 3- or 5-lobed, petiolate, sometimes reduced or caducous at flowering time. Tendrils simple, filiform, short. Flowers small, 5-merous; male flowers in long pedunculate racemes; female flowers solitary or in fascicles of 2–4. Receptacle tube narrow-infundibuliform, elongate, sepals lanceolate, ~2 mm long; corolla cream, petals connate at base, ~10 mm long, bifid on distal half, each lobe usually coiled; stamens 3, inserted near the mouth of the tube, filaments very short, two

anthers bitheous, one monotheous with straight thecae; ovary globose to fusiform with two placentae and many horizontal ovules, stigma two, bifid. Fruit an indehiscent berry, ovoid-oblong, green or red, often white-spotted, rostrate, smooth, glabrous,  $\sim 4 \times 2$  cm. Seeds many, ovoid to subglobose, tumid, smooth and pale, with distinct margin.

**Distinctive features:** Dioecious or monoecious vines with bifid petals and often white-spotted berries with ovoid pale seeds.

**Distribution:** A South American genus of 12 species east of the Andes, from Colombia to NE Brazil and South to northern Argentina, and Lesser Antilles, nine species within the Neotropics with most species restricted to Brazil; semiarid plains, mountain slopes, roadsides, and cultivated ground; 0–100 m.

**CIONOSICYS** Grisebach, Fl. Brit. W. I. 288. 1860.

Monoecious, herbaceous or woody perennial vines, several meters long. Leaves simple,



*Cionosicys guabubu*, ♂ flower, photo by B. Hammel.

large, coriaceous, ovate, entire or trilobed, petiolate. Tendrils simple. Flowers large, 5-merous, solitary and axillary. The receptacle-tube turbinate in male flowers, cup-

shaped in female flowers, sepals ovate-lanceolate; corolla funnel-shaped to rotate, greenish white, lobes ovate-oblong, fused at the base; stamens 3, inserted at the base of the tube, filaments free, the anthers connate into a central column; ovary ovoid, placentae 3, with many, ascending to horizontal ovules, the stigmata strongly papillose. Fruit a large, ovoid, fleshy, hard-shelled pepo, to 10 cm across, glabrous, ripening orange-yellow, edible, tasting like Papaya. Seeds many, elliptic, tumid, 1–1.8 cm long, in white or reddish pulp; testa dark brown to black.

**Distinctive features:** Monoecious vines with simple leaves and large greenish white flowers and large ovoid hard-shelled edible fruits containing large elliptic dark brown or black seeds.

**Distribution:** A neotropical genus of 4 species distributed from northern Mexico to Panama, Cuba and Jamaica; forest margins and montane forests; 100–650 m.

**CITRULLUS** Schrader in Ecklon & Zeyher, Enum. 279. 1836 (nom. cons.).

Monoecious, annual herbaceous vines, creeping or climbing, up to 6 m long. Stems



*Citrullus lanatus*, photo by H. Schaefer.

sulcate, pubescent. Leaves simple, rounded or broadly triangular-ovate, palmately 3–5-lobed, the segments lobulate or dissected, petiolate. Tendrils bifid, trifid or simple. Flowers 5-merous, axillary, usually solitary. Receptacle-tube broadly campanulate with narrow sepals; corolla yellow, rotate or broadly

campanulate, medium-sized, lobes ovate-oblong, connate at the base; stamens 3, inserted near the base of the tube, filaments free, short, two anthers bitheous, one monotheous with flexuous



thecae; ovary ovoid, with 3 placentae with many horizontal ovules, the style short, columnar with three thick, reniform, more or less trilobed stigmata. Fruit edible, large, globose or oblong, with fleshy red or yellow mesocarp, indehiscent, glabrous. Seeds many, oblong, compressed, smooth; testa pale yellowish, blackish or brown.

**Distinctive features:** Monoecious, annual creeper with palmately 3–5-lobed leaves, medium-sized yellow flowers with flexuous anther thecae and short style, fruits fleshy, large, globose or oblong.

**Distribution:** An Old World genus of 7 species some of which are cultivated for their edible fruits. *Citrullus lanatus* (Thunb.) Matsum. & Nakai, the common water-melon, is widely cultivated and locally naturalized in the Neotropics; disturbed, open areas, commonly in sandy substrates; 0–300 m.

**COCCINIA** Wight & Arnott, Prodr. 347. 1834.

Dioecious, subwoody vines, trailing or climbing, reaching up to 20 m long, with woody



*Coccinia grandis*, ♂ flower, photo by P. Acevedo.

base and  $\pm$  tuberous roots. Stems herbaceous, pentagonal, reaching 2 cm in diam.; cross section with axial vascular elements divided in radial segments by broad rays (Figure 93B). Leaves simple, pentagonal-cordate, with dentate margins, the teeth yellowish brown glandular.

Tendrils simple. Flowers 5-merous, 3–4 cm

long, solitary (in other Old-World species clustered or in racemes). Receptacle-tube short,

turbinate, green, with dentiform sepals; corolla yellowish to snow-white, funnel-shaped, the lobes ovate, as long as or shorter than the tube; stamens 3, inserted at the base of the tube, filaments free, apically connate or completely connate, the anthers free or forming a central head, all bitheous; ovary ovoid, oblong or linear, smooth, with 3 placentae and many horizontal ovules, the style columnar, stigmas bilobed. Fruit indehiscent, an edible, fleshy berry, ellipsoid, 3–5 cm long, ripening scarlet-red, often with a few light spots or lines. Seeds many, obovate, compressed; testa fibrillose, marginate.

**Distinctive features:** Dioecious herbaceous vines; leaves cordate, scabrid, with dentate-glandular margins; corolla white, funnel-shaped; fruit a fleshy, ellipsoid, edible berry, ripening scarlet-red.

**Distribution:** An Old World genus of 25 species, of which *C. grandis* (L.) Voigt is naturalized throughout the Neotropics, locally becoming invasive; 0–300 m.

**CUCUMIS** Linnaeus, Sp. Pl. 1011. 1753.

Monoecious, herbaceous, annual vines, climbing or trailing, with fibrous roots, reaching



*Cucumis anguria*, ♂ flower, photo by P. Acevedo.

~2 m long. Leaves simple, entire, dentate or palmately lobed, petiolate. Tendrils simple, shorter than the leaves. Flowers 5-merous, solitary or in axillary fascicles, small to medium-sized. Receptacle-tube

funnel-shaped, campanulate or disciform, sepals minute, long-triangular to filiform; corolla yellow, campanulate, the lobes elliptic or (ob)ovate, free or connate at base into a short tube; stamens 3, inserted on upper half of the tube, filaments free, short, glabrous, two anthers bithecaous, one monothealous with lateral, straight or triplicate thecae; ovary globose to oblong, hairy, with 3 placenta bearing several horizontal ovules, the style terete, thick, glabrous, stigma entire, sub-lobate or trilobed with fleshy lobes, often with 1–9 finger-like projections on the margin. Fruit fleshy, globose to ellipsoid, cylindrical, (ob) ovoid, or fusiform, smooth, glabrous, pubescent, densely echinate, pustulate or tuberculate, sometimes beaked, ripening yellow or greenish to brownish, often with longitudinal pale stripes, usually indehiscent. Seeds ovate, elliptic, circular or lenticular, compressed, small to medium-sized; testa light-colored, smooth or ornamented, glabrous or rarely puberulent, margin often distinct.

**Distinctive features:** Annual climbers or trailers with hispid leaves, simple tendrils, medium-sized yellow flowers, and ovoid to spindle-shaped fruits with white or orange-yellow, often sweet flesh.

**Distribution:** An Old World genus of ~63 species, 3 of which (*C. melo* L., *C. sativus* L. and *C. anguria* L.) are widely cultivated for their edible fruits (cucumbers, muskmelons, horned melons and gherkins). The referred species have become locally naturalized in the Neotropics including the invasive weed *C. dipsaceus* Spach; disturbed ground and abandoned fields; 0–2,000 m.

**CUCURBITA** Linnaeus, Sp. Pl. 1010. 1753.

Monoecious annual (or rarely perennial), herbaceous vines, climbing or trailing, reaching



*Cucurbita okeechobeensis*, photo by P. Acevedo.

6 m long, with fibrous or fleshy roots. Stems angular and often hollow, with soft or slightly rigid pubescence.

Leaves simple, ovate-cordate to suborbicular, pedately 3–5(–7)-lobed, sometimes with fetid odor, long-petiolate.

Tendrils 2- to 7-fid, rarely simple (absent in cultivars like zucchini). Flowers, large, solitary, axillary. Receptacle tube campanulate, rarely cylindrical, with (4)5(–7),

lanceolate or foliaceous sepals; corolla yellow,

campanulate, deeply lobed; stamens 3, inserted at the base of the tube, filaments short, fleshy, two anthers bithecal,

one monothecous, fused into a central head; ovary oblong,

globose, cylindrical or pear-shaped, constricted at apex, with 3–5 placentae and many horizontal ovules, the style short, thick, with 3–5, bifid stigmata. Fruit a large, fleshy, indehiscent pepo of variable form and color, smooth or ribbed, with woody or corky peduncle, the mesocarp soft, fibrous, white, yellow or orange, sweet or bitter. Seeds many, ovate to elliptic, strongly compressed; testa smooth, cream or black, with or without a distinct margin.

**Distinctive features:** Annual or perennial monoecious climbers or trailers, with 2–7-fid tendrils, large leaves, large yellow flowers, and (very) large pepo fruits.

**Distribution:** A New World genus of ~18 species native to Continental America, 15 of which are found in the Neotropics, most diversity in Mexico with 13 species; many species cultivated worldwide for their edible fruits (squash or pumpkin); disturbed places, humid ravines,

floodplains, tropical deciduous forest, grasslands, deserts, rocky hillsides, oak- and pine-oak forests; 0–600 m.

Note: A few cultivars of *Cucurbita pepo* - zucchini, courgette, develop into bushy tendriless plants.

**CUCURBITELLA** Walpers, Repert. Bot. Syst. 6: 50. 1846.



*Cucurbitella asperata*, ♂ flower, photo by B. Schlumpberger.

Monoecious or dioecious, herbaceous vines, climbing or trailing, reaching several meters long, with perennial tuberous roots. Leaves simple, entire, dissected, or palmately 3–7-lobed, petiolate, with unpleasant odor. Tendrils simple. Flowers small, male flowers produced in racemes (rarely solitary), female flowers solitary. Receptacle-tube campanulate with five sepals; corolla orange to yellow, radiate, the five petals fused in the lower half; stamens 3, inserted near the mouth of the tube on short, conspicuously hirsute filaments, two anthers bithecaous, one monothealous, with straight thecae; pollen tricolporate, finely reticulate,

medium-sized; ovary oblong, pubescent, with five placentae and many horizontal ovules, the style columnar with five bifid stigmata. Fruit a globose berry, ripening greenish with white spots or lines. Seeds many, ovate, compressed embedded in a green, sticky pulp; testa smooth, brown, with distinct margin.

**Distinctive features:** Monoecious or dioecious herbaceous climber or trailer with tuberous root, simple tendrils, leaves with unpleasant odor, small orange to yellow flowers and globose greenish berries with pale spots or lines and many seeds in green, sticky pulp.

**Distribution:** A south-central South American genus of a single variable species (*C. asperata* (Hook. & Arn.) Walp.) which might turn out to be in fact a group of several cryptic species; dry scrubs and disturbed grounds; Bolivia, Brazil (MT, MS), Paraguay, Uruguay, and Argentina; dry bushland, 200–800 m.

**CYCLANTHERA** Schrader, Index Sem. Gött. 1831: 2. 1831.

*Cremastopus* P.G. Wilson (1962); *Pseudocyclanthera* Mart. (1954); *Rytidostylis* Hook. & Arn. (1840).

Monoecious, annual or perennial, herbaceous vines, reaching up to 10 m long. Leaves simple, lanceolate, cordate or orbicular, 3–9-lobed, or pedately 3–7-foliolate, margins glandular



*Cyclanthera langaei*, photo by P. Acevedo.

dentate; petioles short, stout, furrowed. Tendrils simple or bifid (rarely many-fid), to 30 cm long. Flowers small to medium-sized; male flowers in racemes or panicles; female flowers solitary (rarely in groups of 2–3), often at the base of the male inflorescence. Receptacle-tube cup-shaped, elongate-tubular or campanulate, often with 5 dentiform, filiform or subulate sepals; corolla rotate, light yellow or white with greenish venation, with 5 (–10) (ovate-) triangular lobes; stamens 3, the filaments fused into a central column, the anthers connate into a globose or disc-

shaped head; ovary ovoid to obliquely ovoid, often rostrate, hirsute, echinate, or setose, with 1 to many ovules, the style very short or elongate, slender with large, subglobose to spherical stigma. Fruit obliquely ovoid to reniform or triangular, fleshy, often setose or echinate (rarely glabrous), explosively dehiscent (rarely indehiscent). Seeds 1 to many, compressed, angled, 2-lobed at apex and base, often  $\pm$  turtle-shaped; testa crustaceous and verrucose.

**Distinctive features:** Annual or perennial herbaceous vines with small greenish white flowers; anthers connate into a globose or disc-shaped head; fruits setose or echinate, explosively dehiscent, seeds often  $\pm$  turtle-shaped; testa crustaceous, verrucose.

**Distribution:** A New World genus of 40 species distributed from Southwestern United States to northern Argentina including the Galapagos, 38 species in the Neotropics; disturbed habitats (roadsides, clearings and cultivated grounds, hedges), tropical deciduous forests, and montane cloud forests; 100–2,500 m. *Cyclanthera pedata* Schrader (caigua, achocha, slipper gourd) is cultivated as a vegetable in tropical regions worldwide.

**DOYEREA** Grosourdy, Med. Bot. Criollo 1: 338. 1864.

Dioecious, herbaceous vines reaching 10 or more m long. Stems cylindrical, fleshy,



*Doyerea emetocathartica*, photo by P. Acevedo.

fragile with a thick, trunk-like base and tuberous roots.

Leaves simple, rounded-cordate or trilobed (sometimes to almost trifoliolate), often with prominent, marginal

callosities; petiole sulcate, pubescent, ~4 cm long. Tendrils

simple, with thickened base that persists as a conical spur-like structure. Inflorescence short, axillary, sessile cymes

with few to 40, small flowers produced in dense clusters. Receptacle-tube green or pale orange, campanulate, with

five oblong, reflexed sepals, to 2 mm long; corolla white,

yellowish green, or pale orange, campanulate with five lobes slightly longer than the tube, often reflexed at apex; stamens 3, inserted near the mouth

of the tube, filaments short, free, two anthers bitheous, one monotheous; ovary ellipsoidal with two placentae and 4–6 ovules per locule, the style thick, simple, with 2 penicillate, subglobose

stigmata. Fruits ellipsoid or oblong, fleshy, rostrate, 1–3 cm long, indehiscent, thin-walled,

ripening orange or red with white spots. Seeds 8–15, pear-shaped, slightly compressed, 3–4 mm

long; testa reddish brown with distinct pale brown margin.

**Distinctive features:** Perennial dioecious climber with stout woody base, simple leaves with conspicuous marginal callosities, simple tendrils and small flowers in dense clusters. Seeds pear-shaped, slightly compressed, reddish brown, with distinct pale brown margin.

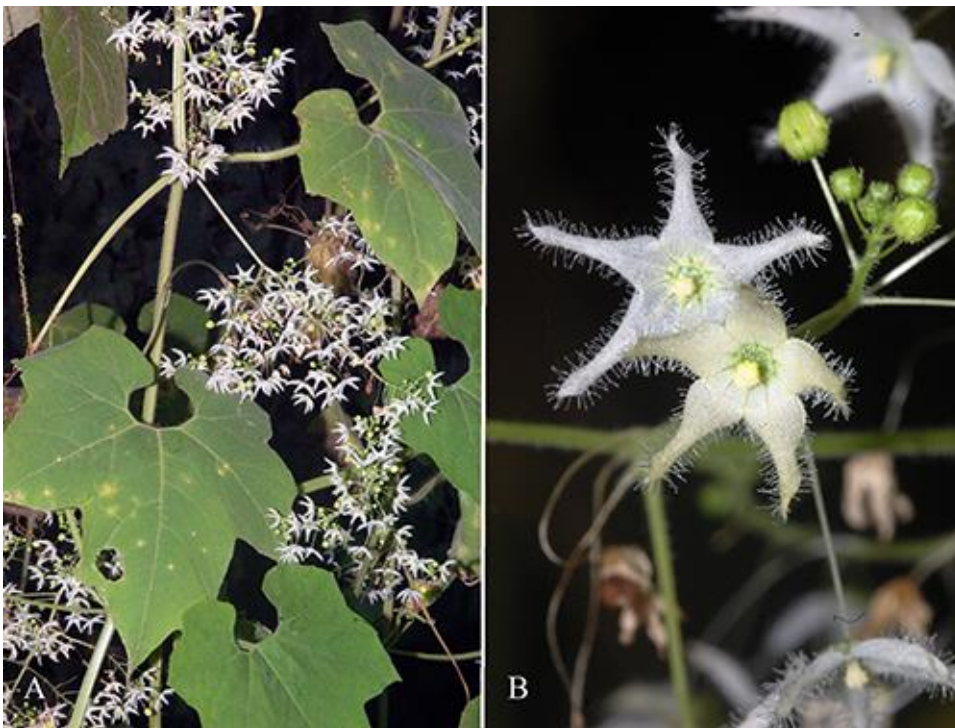


**Distribution:** A neotropical genus with one species distributed from Mexico to northern South America (Venezuela, the Guianas, and Brazil), including the West Indies; dry thickets and coastal woodlands; 0–150 m.

**ECHINOPEPON** Naudin, Ann. Sci. Nat. Bot. ser. 5, 6: 17. 1866.

*Apatzingania* Dieterle (1974); *Brandegea* Cogn. (1890); *Vaseyanthus* Cogn. (1891).

Monoecious, herbaceous, annual or perennial vines, up to 5 m long, with fibrous roots or



*Echinopepon wrightii*, ♂ flowers, photo by B. Hammel.

woody rootstock.  
Leaves simple,  
angulate-cordate,  
often palmately 3–5(–  
9)-lobed or dissected  
blades, thin, with  
entire or denticulate  
margins, petiolate.  
Tendrils simple or 2–  
3-fid. Flowers small;  
male flowers in

racemes or panicles; female flowers are mostly solitary. Receptacle-tube green, cup-shaped to urceolate or shallowly campanulate with five small or minute sepals; corolla white or cream, rotate or campanulate with five ovate-triangular petals; stamens 3–5, the filaments fused into a central column, the anthers free, bithecous; ovary conical to ovoid, ± rostrate, with one or two placentae and 1–5 erect to ascending (rarely horizontal or pendent) ovules per locule, the style

short, the stigma fleshy, subglobose. Fruit ovoid or ellipsoid, operculate, glabrous or hairy, often conspicuously echinate, rostrate. In *E. arachnoideus* (Dieterle) A.K. Monro & Stafford the fruit is dry, subterranean (to 3.5 cm deep), on 6–9 cm long peduncle. Seeds solitary or few, quadrangular or angular-ovoid, compressed; testa smooth, rugose or sculptured.

**Distinctive features:** Annual or perennial monoecious vines with white or cream flowers and often conspicuously echinate, setose or prickly, operculate fruits and relatively small, ± compressed angular seeds.

**Distribution:** A neotropical genus of ~22 species distributed from southern United States to northern Argentina, most diverse in Mexico; 12 species in the Neotropics; forest clearings, semi-deserts, disturbed areas, ravines, sand dunes and coastal areas; 200–3,000 m. Some species are weeds of cultivated ground.

**FEVILLEA** Linnaeus, Sp. Pl. 1013. 1753.

Dioecious, perennial lianas, 10 or more m long; cross sections with deep phloem wedges with discontinuous cambium (Figure 94B). Leaves simple, unlobed, pedately 3–7-lobed or 3–5-foliolate, margins sometimes with secondary veins projecting as a glandular tooth; petiole more or less elongated, sometimes bearing two glands above the distal ½ portion (Figure 95B).

Tendrils short or very long, simple or apically bifid, coiling above and below branching point.

Male flowers in panicles or fascicles; female flowers solitary or in pairs. Receptacle-tube saucer- or cup-shaped with five, deeply lobed sepals; corolla greenish, yellow or pinkish orange, rotate, petals 5, suborbicular or oblong-hastate, nearly free, ca 4 mm long, lower margins fused to the

sepals and extending into a glandular protuberance; stamens 5, inserted near the center of



*Fevillea cordifolia*, photo by P. Acevedo.

receptacle, the filaments short, free, the anthers bithecaous with straight, vertical thecae; ovary obconical, subtrigonus, trilocular at the apex and unilocular at the base with three placentae and four pendent ovules per locule, the styles 3, each with bifid stigmata. Fruit a globose or ovoid-oblong, subwoody, mottled green, brown or reddish pepo, 8–16 × 7–13 cm, indehiscent or dehiscent along a large circular calyx scar (Figure 98C). Seeds 10–15, orbicular, compressed, up to 6 × 2 cm; testa pale brown, smooth to striate-verrucous or pustulate, often with a narrow, wing-like margin; endosperm rich in oils.

**Distinctive features:** Perennial dioecious liana often with apically bifid tendrils, *F. pedatifolia* with two glands above the distal ½ of the petiole, small male flowers in panicles or fascicles and large globose or ovate-oblong subwoody pepo with a large circular scar near the apex; seeds large, circular.

**Distribution:** A neotropical genus of seven species distributed from southern Mexico to northern Argentina including the West Indies; canopy lianas of moist, wet or gallery forests; 0–1,700 m.

**FRANTZIA** Pittier, Contr. U.S. Natl. Herb. 13: 127. 1910.

*Polakowskia* Pittier (1910).

Monoecious, herbaceous vine, several meters long, with tuberous roots. Tendrils 3- to 5-fid. Leaves simple, palmately lobed or angulate, long-petiolate. Flowers small; male flowers in



*Frantzia tacaco*, fruit & ♂ flowers, photo by A. Yakovlev.

racemes; female flowers solitary or in groups of 2–5, often coaxillary with male inflorescences. Receptacle-tube semi-globose, with ten pouch-like nectaries at the base, some species with umbrella-like covering over the nectaries, sepals 5, triangular or rounded, thick; corolla white, rotate, petals 5, ovate-lanceolate, acute; stamens 3, inserted at the base of the tube, filaments fused on a central column, two anthers bitheous, one monotheous, or all

anthers connate into a subglobose head; ovary fusiform, setose with one placenta and one pendent ovule, the style short with a 3–5-lobed stigma with reflexed lobes. Fruit 3–6 cm long, fleshy, ovoid to fusiform, indehiscent, sulcate at the apex, sparsely spiny along the ridges or at the apices or glabrous, ripening green, yellowish or purple. Seed solitary, ovate, compressed, pendent, woody, often germinating within the fruit.

**Distinctive features:** Monoecious vine with 3- to 5-fid tendrils, ten pouch-like nectaries at the base of the receptacle-tube, and 3–6 cm long fleshy, indehiscent fruits with a single large seed.

**Distribution:** A neotropical genus of seven species found in Costa Rica, Nicaragua and Panama; forests and secondary scrubs; 200–1,750 m. *Frantzia tacaco* (Pitt.) Wunderlin is widely cultivated as a vegetable.

**GURANIA** (Schltdl.) Cogniaux, Bull. Soc. Roy. Bot. Belgique 14: 239. 1875.

*Dieudonnaea* Cogn. (1875).

Duodichogamous vines or lianas, reaching 15 or more meters long. Stems of woody

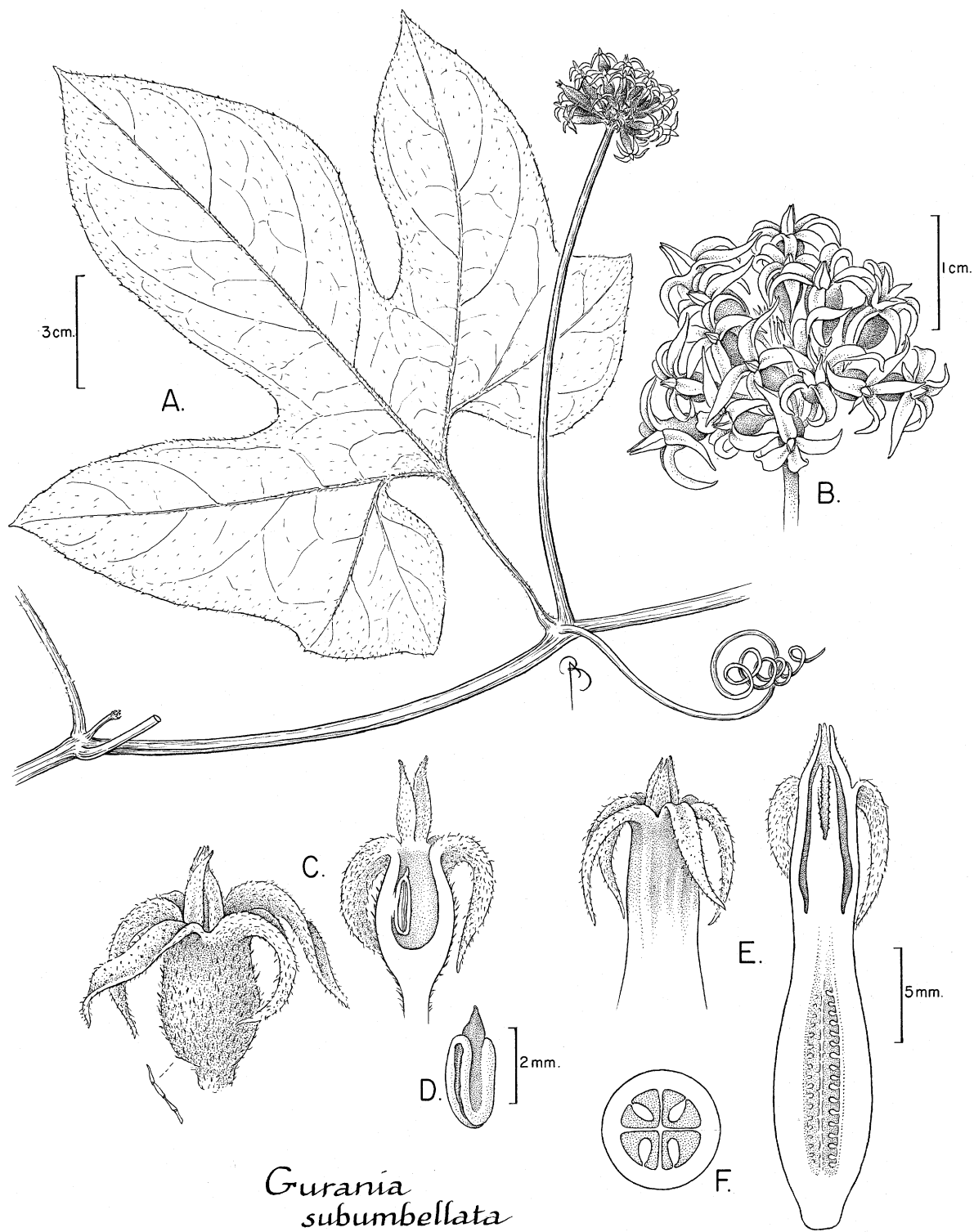


*Gurania lobata*, ♀ inflorescence, photo by P. Acevedo.

species nearly cylindrical or obtusely pentagonal; cross sections in some species with axial vascular elements divided in radial segments by broad strips of ground tissue, later producing additional vascular cylinders on the periphery of the initial vascular cylinder (Figure 93D). Leaves simple,

ovate-cordate, palmately-lobed or

3-foliolate, often long petiolate. Tendrils simple. Flowers medium-sized; male flowers in fascicles or racemes; female flowers solitary or few together; inflorescences often long-peduncled. Receptacle-tube bright orange to red or yellow (yellowish green), urceolate to cylindrical, fleshy, sepals commonly  $\frac{1}{4}$  to  $\frac{1}{3}$  the length of the tube, with same coloration as the tube or sometimes with green or yellow tip, often spreading; corolla gamopetalous, yellow or orange, fleshy, commonly shorter than the calyx, the lobes commonly lanceolate and erect; stamens usually two, inserted on upper half of the tube, filaments short, the anthers bithecal, with curved to convolute thecae; ovary cylindrical, smooth with two placentae and many, horizontal ovules, stigmata two. Fruits fleshy, up to  $7 \times 2-3$  cm, cylindrical, ellipsoid to pear-



**Figure 100.** *Gurania subumbellata*. **A.** Flowering branch. **B.** Detail of pistillate inflorescence. **C.** Staminate flower, lateral view & longitudinal section. **D.** Anther tip & connective. **E.** Pistillate flower, lateral view & longitudinal section. **F.** Ovary cross section. Drawing courtesy of Bobbi Angell.

shaped, indehiscent, ripening green. Seeds numerous, oblong-elliptic, compressed, embedded in a yellow pulp; testa smooth, grey to blackish, sometimes slightly marginate.

**Distinctive features:** Calyx showy, fleshy, commonly orange to red, and longer than the corolla; fruits fleshy, elongated, often hanging.

**Distribution:** There are currently 48 accepted species of *Gurania* in POWO, but the actual species number is probably ~35–40. From southern Mexico to Bolivia and eastern Brazil; lowland rainforest to Andean cloud forest; 200–3,000 m.

**HANBURIA** Seemann, Bonplandia 6: 293. 1858.

Monoecious vines or lianas, reaching up to 15 m long. Mature stems obtusely pentagonal;



*Hanburia mexicana*, photo by P. Acevedo.

cross sections with axial vascular elements divided in radial segments by broad rays (Figure 93E). Leaves simple, broadly-ovate to cordate or pentagonal, entire or 3–7-lobed, some species with discoidal glands at the base of the blade, petiolate. Tendrils 2–5-fid or rarely simple, sometimes with adhesive disks. Flowers medium-sized to large, fleshy; male flowers in pedunculate racemes; female flowers solitary or at the base of the male inflorescence, in some species with conspicuous vanilla-scent. Receptacle-tube short, urceolate-cylindrical or campanulate with five short, triangular or linear to subulate, green sepals; corolla

yellow, greenish white or white, rotate with deep spreading lobes to ± campanulate with five to

six, triangular, 5–30 mm long petals; stamens 3–5, inserted near the base of the tube, the filaments fused into a central column, the monothealous anthers fused into a central, globose head; ovary ovoid to subglobose or oblique, mostly rostrate, hispid, with several, erect to ascendent ovules, style elongate with a peltate stigma. Fruit fleshy, 11–14 × 7.5 cm, setose, echinate or rostrate, ovoid or asymmetrically pouch-like, explosively dehiscent. Seeds few, large, circular, 2–4 cm in diameter, or ovate to pear-shaped, compressed, angularly lobed, embedded in white, spongy pulp; testa black to grey, smooth or minutely rugulate, with distinct margin.

**Distinctive features:** Monoecious perennial climber with large cordate or pentagonal leaves, some with discoidal glands at the base, tendrils 2–5-fid, some with adhesive discs, large fleshy, greenish yellow or white flowers and a fleshy, densely echinate, explosively dehiscent fruit with few large circular seeds in spongy pulp.

**Distribution:** A neotropical genus of seven species distributed from northern Mexico south to NW South America (Colombia, Venezuela, Ecuador and Peru); primary and disturbed rainforests, deciduous forests, and cloud forests; 600–1,700 m.

**HELMONTIA** Cogniaux, Bull. Soc. Roy. Bot. Belgique 14: 239. 1875.



Monoecious, vines or lianas, reaching several meters long. Leaves simple, entire,



*Helmontia leptantha*, photo by P. Acevedo.

palmately lobed or trifoliolate, short-petiolate.

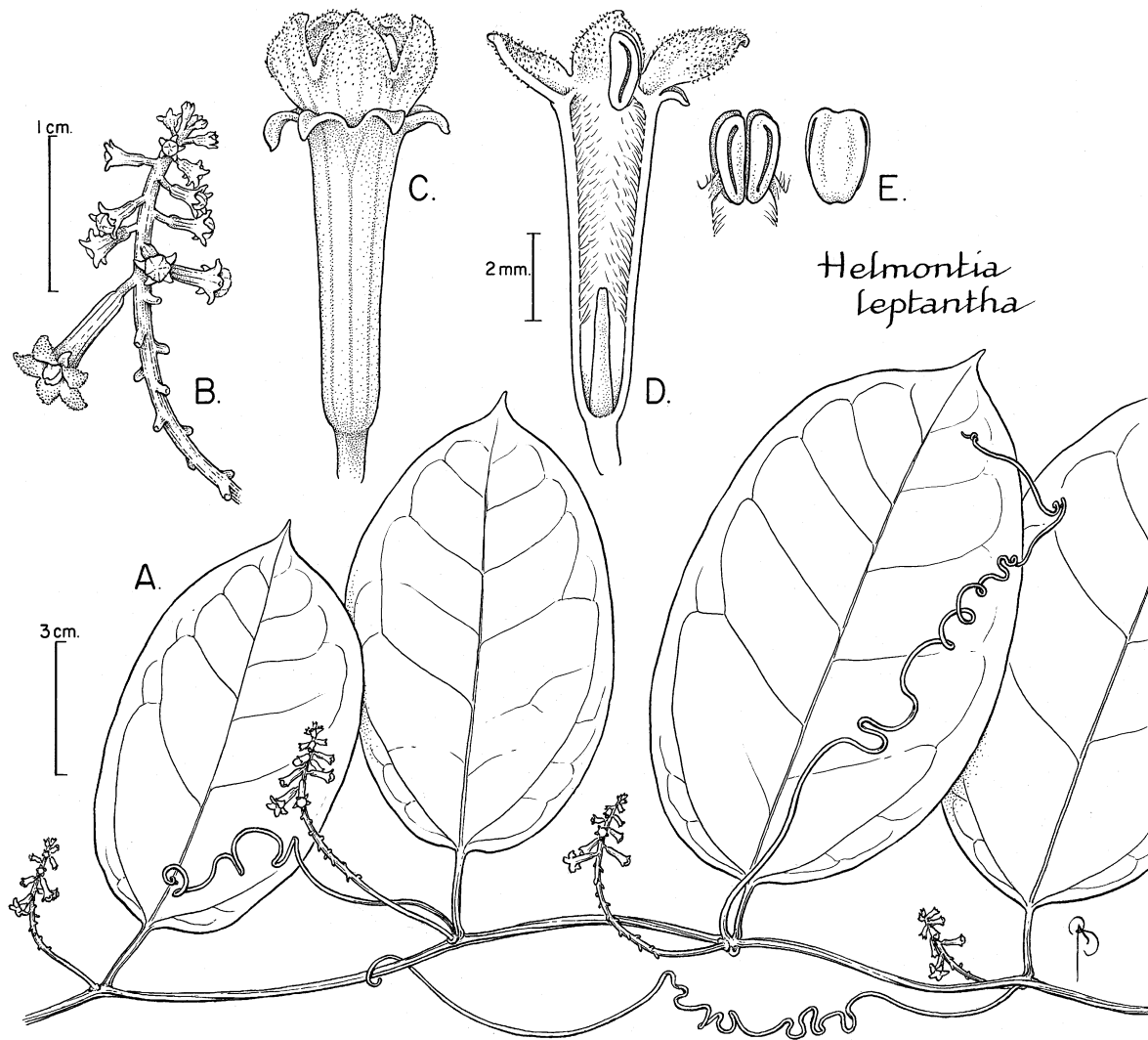
Tendrils simple. Flowers small; male flowers many (>100 per inflorescence), in racemes or umbels; female flowers in pendulous racemes.

Receptacle-tube obconic to cylindrical with five small, triangular, reflexed sepals; corolla white or yellowish green, rotate or the five petals fused into a tubular lower part, c. 3 mm long; stamens 2, inserted near the mouth of the tube, filaments free, anthers bithecous. Fruits fleshy, ovoid to ellipsoid, indehiscent, ripening yellowish green.

Seeds many, smooth, oblong-elliptic, compressed.

**Distinctive features:** Monoecious climber with simple leaves, simple tendrils, and large racemes or umbels of many inconspicuous flowers, with white or yellowish green, c. 3 mm long petals.

**Distribution:** A neotropical genus of three species from northern South America (Venezuela, the Guianas and Brazil (Amazonas, Pará and Amapá); moist or wet forests; 80–350 m.



**Figure 101.** *Helmontia leptantha*. **A.** Flowering branch. **B.** Detail of staminate inflorescence. **C.** Staminate flower, lateral view. **D.** Staminate flower longitudinal. **E.** Stamens, lateral & frontal views. Drawing courtesy of Bobbi Angell.

**IBERVILLEA** Greene, *Erythea* 3: 75. 1895.

*Dieterlea* E. J. Lott (1986).

Dioecious, annual or perennial vines or lianas, up to 12 m long, with large tuberous



*Ibervillea maxima*, ♂ plant, photo by S. Renner.

rootstocks, often partly exposed as fleshy pachypodia. Leaves simple, to 10 × 6 cm, unlobed or 3- or 5-lobed, often with dissected lobes, petiolate. Tendrils simple. Flowers small or less often large, mostly opening during the day, except for *I. fusiformis* (E.J. Lott) Kearns that

has strongly fragrant, nocturnal

flowers; male flowers in racemes or fascicles (rarely solitary); female flowers solitary.

Receptacle-tube narrowly campanulate to cylindrical, up to 4.5 cm long, with five small, acute sepals; corolla narrowly campanulate white or yellowish with five petals, 4–25 mm long, +/- bifid at apex, united near the base; stamens 3, inserted near the mouth of the tube, filaments free or filaments fused into a central column, two anthers bithecous, one monothealous with straight thecae; ovary ovoid to fusiform or cylindrical with 3–5 placentae and many, horizontal ovules, the style columnar with 3–5 stigmata. Fruit a fleshy, indehiscent, globose, ovoid, ellipsoid or fusiform berry, 1.5 to 6 cm in diameter and up to 15 cm long, shortly rostrate, ripening yellow to red. Seeds many, irregularly ovoid or turgid, scarcely compressed, embedded in orange-red pulp; testa smooth or verrucous, transversely ridged or smooth, the margins raised.

**Distinctive features:** Vines or lianas with fleshy tuberous roots, often partly exposed as fleshy pachypodia; petals +/- bifid at apex; fruit an up to 15 cm long, fusiform or ellipsoid, shortly rostrate berry.

**Distribution:** A New World genus of eight species distributed from Texas to Guatemala, five of which occur within the Neotropics; semi-deserts, grassy plains, swampy woodlands, thorn-forests, and cultivated fields; 50–350 m.

**LINNAEOSICYOS** H. Schaefer & Kocyan, Syst. Bot. 33: 350. 2008.

Dioecious, perennial vines, climbing or trailing, up to 6 m long, with fleshy rootstocks.



*Linnaeosicyos amara*, ♂ flower, photo by T. Mitchell.

Leaves simple, reniform to suborbicular, entire to deeply trilobed, the upper side distinctly pustulate due to short trichomes with discoidal base, petiolate. Tendrils simple, up to 12 cm long. Flowers 5-merous, solitary and nocturnal (Mitchell et al. 2015). Receptacle-tube broadly campanulate, up to 20 mm long, glabrous, with narrow-triangular, ca 10 mm long sepals; petals

ovate,  $\sim 30 \times 12$  mm, white with green veins, with long-fimbriate margins; stamens 3, inserted  $\sim 10$  mm below the mouth of tube, filaments free,  $\sim 1$  mm long, glabrous, two anthers bitheous, one monotheous, all connate into a globose head; ovary ellipsoidal,  $\sim 25$  mm long, with three placentae and numerous ovules, the stigma trilobed with capitate lobes. Fruit turbinate to ellipsoidal, green, pendent,  $8\text{--}12 \times 3\text{--}4$  cm. Seeds several hundred, linear-oblong, compressed, embedded in a soft, whitish pulp; testa yellowish brown, with distinct, flat margin.

**Distinctive features:** Dioecious vines with white, long-fimbriate flowers opening at night and distinctly pustulate leaves.

**Distribution:** A Hispaniolan genus of a single species (*L. amara* (L.) H. Schaeff. & Kocyan) known from Haiti and Dominican Republic; dry thickets and dry forests; 0–400 m.

**LUFFA** Miller, Gard. Dict. Abr. ed. 4. 1754.

Monoecious, herbaceous vines up to 15 m long. Leaves simple, ovate-cordate, palmately



*Luffa aegyptiaca*, photo by P. Acevedo.

3- to 5-lobed, with denticulate margins; petiole with small, lingulate probract (tiny leaf-like appendage) at the base. Tendrils 2–6-fid. Flowers large; male flowers in racemes; female flowers solitary coaxillary with male inflorescence. Receptacle-tube campanulate with 3–5 sepals; corolla golden yellow, of 5 free, undulate petals; stamens 5, inserted near the mouth of the tube, filaments free, the anthers monothealous or two bithealous and one monothealous; ovary smooth, ribbed, tuberculate or spiny with many, horizontal ovules, stigmata 3, bilobed. Fruits subglobose, cylindrical or trigonous, brown

upon drying, beaked, smooth, ribbed or spiny, operculate (Figure 98D); exocarp thin, fragile, breaking up to expose a fibrous-reticulate mesocarp (Figure 98E). Seeds numerous, oblong-elliptic, compressed; testa smooth, blackish, with or without a narrow, distinct membranous border and two oblique bumps above the hilum on each face.

**Distinctive features:** Herbaceous vines with rotate yellow flowers and an operculate, dry fruit with fragile walls that break down to expose a network of fibers that contain the seeds.

**Distribution:** A pantropical genus of 8 species, 3 of which are native to continental tropical America, from Mexico to Bolivia and SE Brazil; 0–200 m. In addition, *L. acutangula* (L.) Roxb.

and *L. aegyptiaca* Miller, two Indian species, are cultivated in the Neotropics as a vegetable and as a source of a fibrous, spongy tissue. *Luffa acutangula* is cultivated in the West Indies while *L. aegyptiaca* is cultivated and naturalized in areas of the Neotropics.

**MELOTHRIA** Linnaeus, Sp. Pl. 35. 1753.

*Melancium* Naud. (1862); *Posadaea* Cogn. (1890).

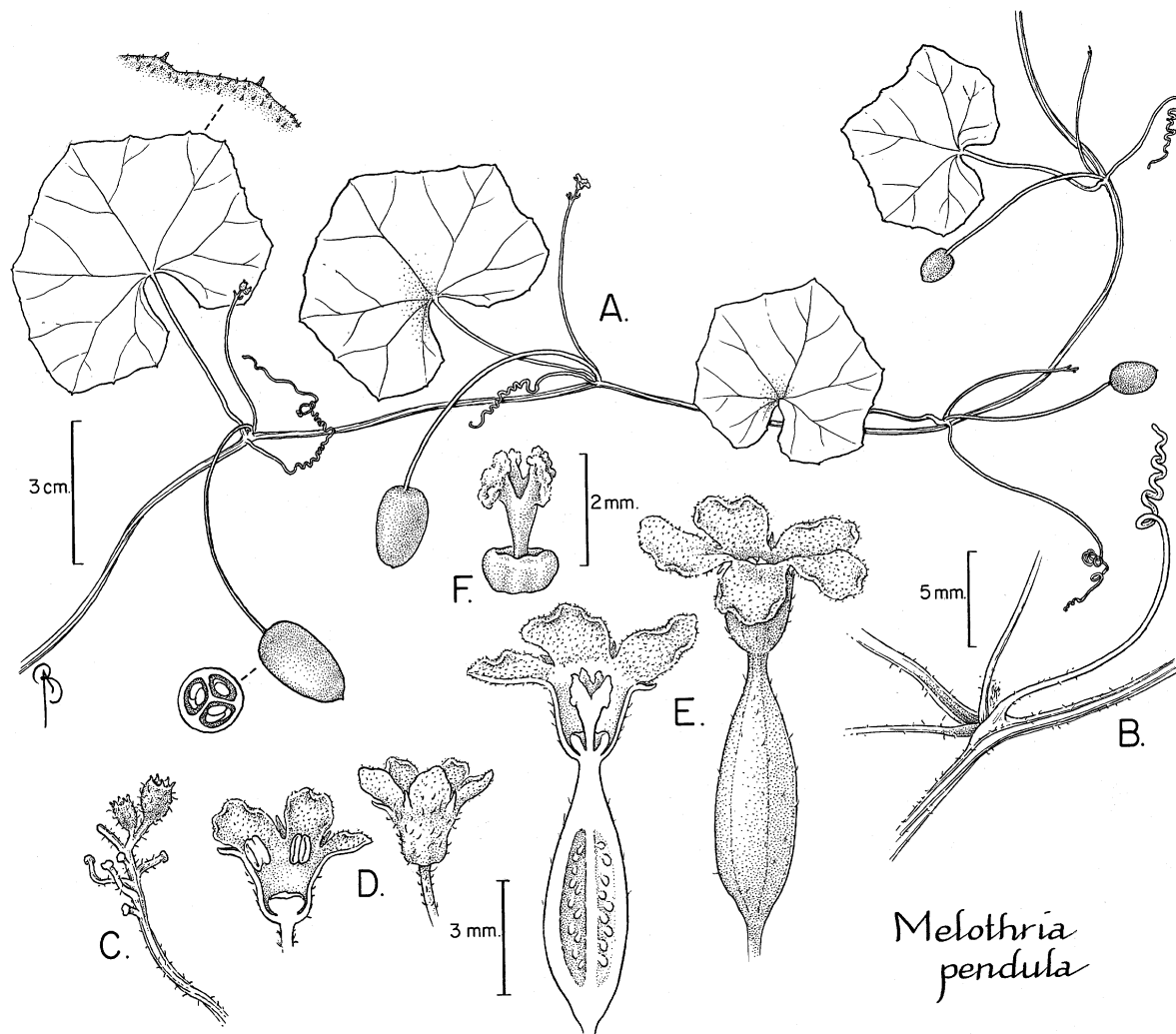
Monoecious or rarely dioecious (e.g., *M. candolleana* Cogn.), herbaceous vines, climbing



*Melothria pendula*, mature fruits, photo by P. Acevedo.

or trailing, up to 10 m long, often with perennial rootstocks. Leaves simple, entire or palmately lobed, ovate-cordate in outline, often with unpleasant odor, thin petiolate.

Tendrils simple (rarely bifid), solitary (rarely 2 per node) or absent (*M. campestris*). Flowers are very small; male flowers in pedunculate racemes or umbels; female flowers solitary or rarely in groups of 2–3, usually co-axillary with male flowers. Receptacle-tube campanulate to cylindrical with five short, dentiform or lanceolate sepals; corolla yellow (less often white), rotate with five entire or undulate, (broadly-)ovate petals, sometimes reflexed and fused at the base; stamens 3, inserted on the upper half of the tube, filaments free, short, slender, two anthers bithecous, one



**Figure 102.** *Melothria pendula*. **A.** Fruiting branch. **B.** Detail of leaf petiole & tendril. **C.** Pistillate inflorescence. **D.** Staminate flower, longitudinal section & lateral view. **E.** Pistillate flower, longitudinal section & lateral view. **F.** Gynoecium. Drawing courtesy of Bobbi Angell.

monothealous (rarely all bithealous), the thecae straight, fringed with hairs and sometimes apically hooked; ovary smooth, ovoid to fusiform with three placentae and many, horizontal ovules, the style short, surrounded at base by an annular disc, stigmata 3, bilobed or one trilobed. Fruit a small to large (up to 20 cm across in *M. sphaerocarpa* (Cogn.) H.S. Schaefer & S.S. Renner), often edible berry, fleshy, indehiscent, smooth, globose or ellipsoid, ripening green, yellow, orange, reddish or purple blackish, long-pedicellate. Seeds numerous, compressed, ovoid or

elliptic, arillate or not, embedded in a fleshy pulp (sweet in *M. dulcis* Wunderlin); testa smooth, ivory-colored, covered by long appressed hairs, with indistinct margin.

**Distinctive features:** Monoecious or dioecious herbaceous vines with simple ovate-cordate leaves, often with unpleasant odor; small yellow (or rarely white) flowers with straight, fringed, anther thecae, and fleshy fruits, often edible.

**Distribution:** A New World genus of 12 species, distributed from southern United States to Mexico south to northern Argentina, including the West Indies; disturbed moist to arid areas, forest margins or woodlands; 0–2,200 m.

**MELOTHRIANTHUS** Martínez Crovetto, Notul. Syst. (Paris) 15: 58. 1954.

Dioecious, herbaceous, perennial vines, climbing or trailing, with tuberous rootstock.



*Melothrianthus sagittifolius* (ined.), ♂ plant, photo by M. Fossati.

Leaves simple, lobed, ovate-cordate or lanceolate with subcordate to sagittate base, petiolate, densely silvery-hairy in *M. argenteus*. Tendrils simple. Flowers small; male flowers in corymbs; female flowers solitary. Receptacle-tube narrowly campanulate with five lanceolate sepals, densely hairy inside; corolla yellowish green, rotate, the five oblong-lanceolate petals fused at the base, entire (in *M. sagittifolius* (name ined.), bilobed at apex); stamens 3, inserted near the mouth of the tube, anthers sessile, two bitheous, one monothecous; ovary narrowly ovate, with two placentae and

many, horizontal ovules, the style robust, inserted in the center of a circular disc, stigma bilobed,



fleshy. Fruit a small, oblong, ovoid or subglobose, smooth or slightly angled, glabrous or (slightly) pubescent berry. Seeds oblong, more or less compressed, and verrucous.

**Distinctive features:** Dioecious perennial climber or trailer with simple tendrils, small yellowish green flowers and small berries with verrucous seeds.

**Distribution:** A genus of four species, three of them endemic to Brazil and one undescribed species in central Argentina; on dry exposed slopes, in savannas or in more humid valleys, including coastal regions of the Atlantic; 0–1,200 m.

**MOMORDICA** Linnaeus, Sp. Pl. 1009. 1753.

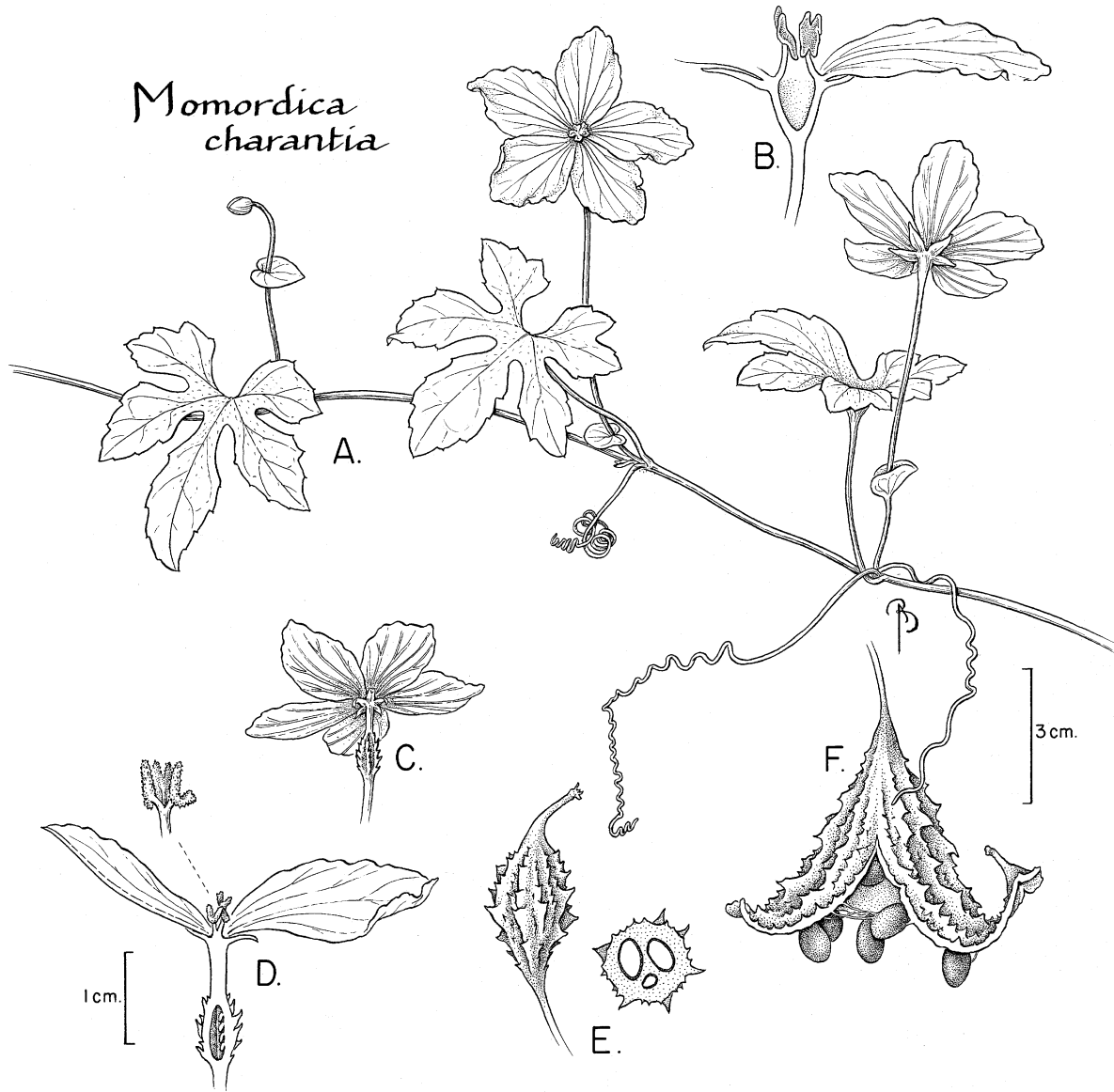
A paleotropical genus with one species (*M. charantia* L.) widespread and naturalized



*Momordica charantia*, fruits, photo by P. Acevedo.

throughout the Neotropics. This species, a monoecious, herbaceous vine, many-branched from base, reaching up to 8 m long. Old stems partly woody at the base, slightly

flattened; cross section with asymmetrically neofomed vascular cylinders (Figure 93F). Leaves pedately 5- or 7-lobed, the lobes deeply undulate or dentate; petioles slender, sulcate or slightly winged. Tendrils simple. Flowers solitary, axillary; peduncle elongate, with a foliose, orbicular



**Figure 103.** *Momordica charantia*. **A.** Flowering branch. **B.** Longitudinal section of staminate flower. **C.** Pistillate flower. **D.** Pistillate flower, longitudinal section & detail of stigma. **E.** Fruit, lateral view & cross section. Drawing courtesy of Bobbi Angell.

bract below the middle. Receptacle-tube green, campanulate, with five lanceolate sepals; corolla pale yellow to orange yellow, rotate with five free petals, two with scales at the base; stamens 3, with free filaments, two anthers are bitheous, one monotheous, the thecae are triplicate; ovary ovoid, beaked, tuberculate, tricarpellate, with numerous horizontal ovules, the style simple,

stigma 3, linear, bilobed. Fruit an orange, fleshy, muricate, fusiform capsule opening by 3 valves. Seeds numerous, pendulous, compressed, ellipsoid, covered by a red, fleshy arillode (Figure 98F), testa sculptured, margins grooved.

**Distinctive features:** Herbaceous vines with slightly fetid smell; leaves pedately 5- or 7-lobed; capsules hanging, orange, opening to expose numerous pendulous seeds with bright red, fleshy arillode.

**Distribution:** A paleotropical genus with more than 50 species, two of which are introduced in the Americas. The African *M. charantia* is widely naturalized in the Neotropics in open disturbed habitats, a large-fruited cultivar is grown in vegetable gardens, while another African species, *M. balsamina* L., is locally cultivated and probably not naturalized. The Asian gac fruit, *M. cochinchinensis* (Lour.) Spreng., is found cultivated in botanical gardens as an exotic.

**PENELOPEIA** Urban, Repert. Spec. Nov. Regni Veg. 17: 8. 1921.

*Anacaona* Liogier (1980).

Monoecious or dioecious, herbaceous or woody vines, up to 10 m long. Leaves simple,



*Penelopeia suburceolata*, ♂ flowers, photo by P. Acevedo.

with triangular outline, pedately 3–5-lobed, petiolate. Tendrils simple (*P. suburceolata* (Cogn.) Urb.) or 2–3-fid (*P. sphaerica* (Alain) H. Schaef. & S.S. Renner). Flowers small to medium-sized; male flowers solitary or in axillary fascicles; female flowers solitary.

Receptacle-tube shortly cup-shaped to

campanulate with five triangular sepals, 4–10 mm long, which are fused in the lower half or free;

corolla orange-yellow (*P. suburceolata*) or pale green (*P. sphaerica*), cylindrical with five (rarely four) petals, fused in the lower half or free; stamens 3, filaments fused into a central column, anthers connate into a central head, the thecae triplicate; ovary ovoid with three placentae and many, horizontal ovules, stigmata three. Fruit globose, smooth, 5–7 cm in diameter, indehiscent, ripening yellowish. Seeds many, elliptical.

**Distinctive features:** Herbaceous vines to 10 m long with small triangular, pedately 3–5-lobed leaves, yellow or pale green, tubular corolla and globose fruits.

**Distribution:** A genus of two species endemic to Hispaniola; humid montane forest; > 1,000 m.

**PEPONOPSIS** Naudin, Ann. Sci. Nat., Bot., ser. 4, 12: 88. 1859.

Dioecious, perennial lianas, 8–10 m long. Leaves simple, broadly ovate-cordate, unlobed



*Peponopsis adhaerens*, photo by O. López Francisco.

or 3- or 5-lobed, 10–18 cm long, usually with a few disc-shaped glands near the base, petiolate. Tendrils multifid, densely short-villous, with apical adhesive pads. Flowers medium-sized, solitary, axillary. Receptacle-tube obconic-tubular, apically expanded, sepals 5, ovate-lanceolate, up to 2 cm long in male flowers, triangular-

lanceolate, acute, 6–7 mm long in female flowers; corolla white to greenish white, broadly campanulate with five, halfway-fused, broadly obovate-oblong, rounded petals, up to 4 cm long; stamens 3, inserted near the base of the tube, filaments free, ~5 mm long, two anthers bithecos, one monotheous, the thecae much convoluted; ovary ovoid, glabrous with three placentae and

many horizontal ovules, the style 12–14 mm long, with 3 papillose, oblong to ovate-oblong stigmata. Fruit a fleshy, dark green, subglobose pepo, 8–10 cm across, splitting into three carpellary segments. Seeds ~200, ovate-oblong, 4–9 × 2–5 mm, compressed; testa greenish to grey, finely perforate, with narrowly winged margin.

**Distinctive features:** Fruit a fleshy, subglobose pepo that splits into three carpellary segments at maturity.

**Distribution:** A Mexican endemic genus of a single, extremely rare species, *P. adhaerens* Naud., distributed in the states of Querétaro, Hidalgo, Puebla and Veracruz; pine forests; 800–1,500 m.

**POLYCLATHRA** Bertoloni, *Novi Comment. Acad. Sci. Inst. Bononiensis* 4: 438. 1840.

*Pittiera* Cogn. (1892); *Roseanthus* Cogn. (1896).

Monoecious, herbaceous vines, climbing or trailing, up to several meters long. Leaves



*Polyclathra cucumerina*, ♂ flower, photo by E. Siekavizza.

simple, cordate, entire, 3- or 5-lobed, petiolate.

Tendrils (2–)4(–6)-fid, up to 20 cm long, with stout axis and adhesive pads. Flowers large,

showy, nocturnal, solitary and axillary;

peduncle very long in male flowers, short in

female flowers. Receptacle-tube campanulate to

obconic-cylindrical, much shorter in female

than in male flowers, sepals 5, triangular in

male flowers, narrow-triangular in female

flowers; corolla white, of 5 broadly rounded

petals; stamens 3, inserted on upper half of the

tube, filaments long, free, two anthers

bitheous, one monotheous, fused into a

central head, the thecae triplicate; ovary ellipsoid with many horizontal ovules, the style slender, elongated with three deeply bilobed stigmata. Fruit a medium-sized berry, ellipsoid to oblong, rounded at the apex, green with white or yellow marks; pericarp splits at maturity into several irregular segments. Seeds many, brown, broadly ovate, compressed, contracted at the base; testa brown, narrowly winged.

**Distinctive features:** Bright white corolla contrasting with orange-yellow staminal head in male flowers. Fruit  $\pm$  dry, splitting into several irregular segments when ripe. Seeds broadly ovate, compressed, contracted at base; testa brown, narrowly winged.

**Distribution:** A neotropical genus of a single accepted species, *P. cucumerina* Bertol. (but perhaps up to six species), found in Mexico, Guatemala, Nicaragua, Costa Rica and Panama; tropical or oak-pine forests (Kearns 1992); 50–1,100 m.

**PSIGURIA** Neck. ex Arnott, J. Bot. (Hooker) 3: 274. 1841.

*Anguria* Jacq. (1760), nom. illeg.

Duodichogamous (Condon & Gilbert 1988), herbaceous or woody vines, 10 m or more in



*Psiguria ternata*, ♂ flower, photo by P. Acevedo.

length. Stems nearly cylindrical and fleshy, reaching 2 cm in diam., bark often corky; cross sections with axial vascular elements divided in radial segments by broad rays (Figure 94A). Leaves simple, entire, palmately 3- or 5-lobed, or 3-foliolate, petiolate. Tendrils simple. Male flowers in axillary racemes or spikes;

female flowers solitary or in groups of 2–5. Receptacle-tube green, urceolate to cylindrical, with five small, triangular, sepals; corolla red, orange, or pink, petals broad, spreading; stamens 2, inserted on upper half up the tube, anthers bithecal with duplicate or rarely straight thecae, sessile; ovary oblong, smooth with two placentae and many horizontal ovules, stigmata two. Fruits fleshy, ellipsoid to oblong, smooth, indehiscent, 3–8 × 2–3 cm, ripening yellowish green or black, sometimes striped. Seeds many, up to 11 mm long, oblong-elliptic, compressed; testa smooth, grey.

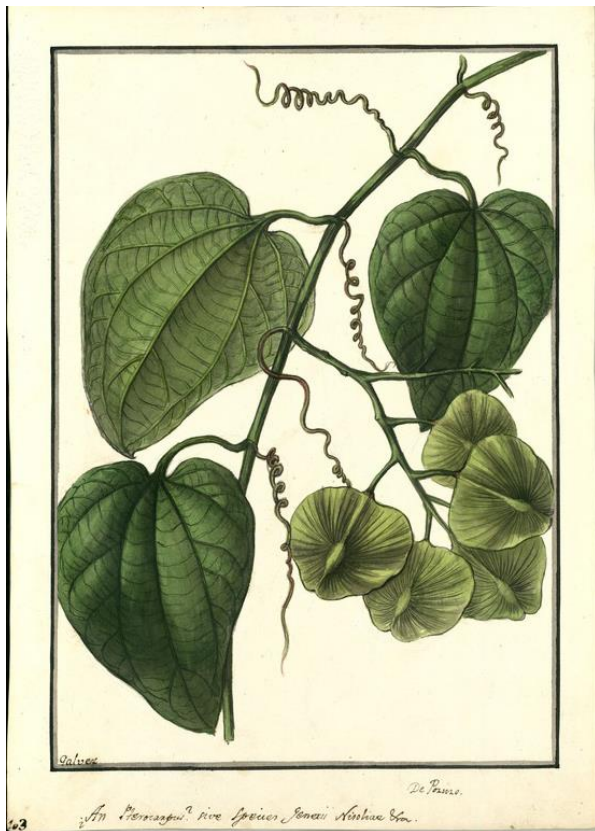
**Distinctive features:** Mature stems with corky bark; leaves shallow to deeply 3- or 5-lobed or trifoliolate; receptacle tube green; corolla orange, red or pink; pollen often in tetrads.

**Distribution:** A neotropical genus of six species distributed from northern Mexico south to Bolivia, Paraguay and SE Brazil, including the West Indies; in moist primary or secondary forests, on granitic or limestone substrate; 0–1,800 m.

**PTEROPEPON** (Cogniaux) Cogniaux, Pflanzenr. IV 275 (Heft 66): 260. 1916.

*Pseudosicydium* Harms (1927).

Monoecious or dioecious, herbaceous or woody vines, with tuberous roots. Leaves



*Pteropepon acariianthum*, drawing by I. Galvez.

simple, subdeltoid, subcircular or subcordate, entire, 3- or 5-lobed, the base subtruncate with two lateral punctate glands just above the insertion of the petiole. Tendrils simple or apically bifid, coiling above and below branching point. Flowers small; male flowers in panicles or thyrses; female flowers solitary or few in monochasia or panicles. Receptacle-tube saucer-shaped with five linear, or deltoid to lanceolate sepals; corolla whitish, greenish or yellowish, rotate with five ovate-lanceolate,

petals, fused at the base; stamens 1–3, inserted

at the base of the tube, filaments short, recurved

and free, less often absent or fused into a central column, the anthers either all monothealous, or



two bithealous and one monothealous, or one bithealous and one monothealous, or only a single bithealous anther, the thecae straight and horizontal; ovary oblong, strongly compressed-subtrigonal, unilocular with an apical placenta and one pendent ovule, the styles 3, each with bifid stigma. Fruit a large, fibrous samara with a continuous, encircling wing or the fruit small, compressed, membranaceous, with two lateral wings, solitary or in groups of 2–3. Seed solitary, pendent, compressed; testa verrucous or scrobiculate.

**Distinctive features:** Leaves with two lateral punctate glands just above the insertion of the petiole; flowers inconspicuous; samaroid fruits with a single seed.

**Distribution:** A South American genus of 6 species found in Colombia, Ecuador, Peru, Bolivia, NW Argentina and Brazil (Amazon region and Bahia), five of which are found in the Neotropics; along ravines and rivers, primary moist forests or rainforests, secondary scrubs; 50–920 m.

**SCHIZOCARPUM** Schrader, Index Sem. Gött. 1830: 4. 1830.

Monoecious, annual or perennial vines, up to 7 m long. Leaves simple, entire, 3- or 5-lobed, petiolate. Tendrils bifid. Flowers solitary, large and showy. Receptacle-tube elongated,



*Schizocarpum parviflorum*, ♂ flowers, photo by J. Álvarez.

subcylindrical at base, expanded distally with five reflexed or ascending, linear, ovate or triangular sepals; corolla campanulate, yellow, inside with dark central spot, petals 5, triangular, fused on lower half; stamens (2)3(4), inserted near the mouth of the tube, filaments free, the anthers connate into a central ovoid head

with triplicate thecae; ovary ovoid or fusiform, often rostrate, with three placentae and 12 or more, ascending ovules, the style slender with 3 fleshy stigmas. Fruit a dry, woody capsule, ellipsoid to pear-shaped, smooth, rostrate, indehiscent or splitting basipetally into three valves, each with two rows of seed chambers, followed by the abscission of the pericarp. Seeds ovoid, compressed, 8–10 mm long; testa smooth, brown or banded crosswise with light and dark stripes, margin with or without wing.

**Distinctive features:** Flowers, solitary, large, campanulate, yellow with dark central spot inside; fruits dry, woody, in some species splitting into 3 woody carpellate units bearing 2 chambers of seeds; seeds ovoid, compressed; testa brown or banded crosswise with light and dark stripes.

**Distribution:** A neotropical genus of 10 species distributed in Mexico and Guatemala; oak or pine forests, deciduous forests, disturbed grounds and coastal plains; 0–2,000 m.

**SICANA** Naudin, Ann. Sci. Nat., Bot., ser. 4, 18: 180. 1862.

Monoecious, annual or perennial vines, up to 15 m long. Leaves simple, ovate to



*Sicana odorifera*, ♂ flower, photo by P. Acevedo.

suborbiculate, palmately 3–9-lobed, up to 24 cm long, often with discoidal glands at the base, petiolate. Tendrils 3–5-fid, with apical adhesive pads. Flowers solitary, medium-sized to large, showy. Receptacle-tube obconical

or campanulate with 5 triangular-lanceolate, reflexed or less often ascendent sepals; corolla campanulate, yellow and sometimes greenish in the center, fleshy, petals 5, as long as or shorter than the tube; stamens 3, inserted near the mouth of the tube, filaments short, free or connate; two anthers bitheous, one monotheous with duplicate thecae; ovary elliptical with three placentae and many horizontal ovules, the style short, with 3 stigmata. Fruit a smooth, firm pepo, globose, ellipsoid or cylindrical, up to 60 cm long, exocarp commonly reddish brown. Seeds many, compressed, ovate, with distinct margin and sometimes narrowly winged.

**Distinctive features:** Herbaceous vine with thick, fleshy, sulcate stems; leaves large, glabrous; flowers yellow, large, fleshy, campanulate; fruit with fleshy, light yellow mesocarp with numerous dark brown seeds.

**Distribution:** A neotropical genus with disjunct distribution, of 4 species, one species native to Peru and Bolivia, another to Cuba and Jamaica, another to Hispaniola, and a fourth one endemic to the island of Trinidad on the northern coast of South America; rainforests and secondary scrubs; 0–600 m. The cassabanana, *Sicana odorifera* (Vell.) Naud. is widely cultivated in northern South America, parts of Central America and the West Indies.

**SICYDIUM** Schlechtendal, *Linnaea* 7: 388. 1832.

*Chalema* Dieterle (1980).

Dioecious or rarely monoecious, perennial or annual vines with tuberous or fibrous roots.



*Sicydium tamnifolium*, photo by J. Amith.

Leaves simple, (sub)cordate at base, acuminate at the apex, petiolate. Tendrils simple or apically bifid, coiling above and below branching point. Flowers small, in axillary panicles. Receptacle-tube saucer-shaped with five small sepals; corolla whitish green, rotate with five ovate-lanceolate to triangular petals; stamens 3 or 5, inserted near the base of the tube, filaments very short, free or connate, the anthers all monothealous or two bithealous and one monothealous with straight thecae; ovary ovoid with one pendent ovule, styles 3, linear, with linear or

punctiform stigmata. Fruits small, baccate, globose, fleshy or fibrous, ripening black, or a dry globose achene, ~3 mm across. Seed solitary, brownish, (sub)globose or compressed; testa rugose to verrucose.

**Distinctive features:** Easily confused with Vitaceae because of the small, globose fleshy fruits, but distinguished by the tendrils at a 90° angle with the petioles (vs. leaf-opposed in Vitaceae) and one-seeded fruits.

**Distribution:** A neotropical genus of 9 species distributed through continental tropical America and Cuba; open and disturbed sites, deciduous forest, gallery forests, moist forests and dry forests; 0–1,800 m.

**SICYOS** Linnaeus, Sp. Pl. 1013. 1753.

*Anomalosicyos* Gentry (1946); *Ahzolia* Standl. & Steyerm. (1944); *Costarica* L. D. Gómez (1983); *Microsechium* Naudin (1866); *Parasicyos* (1975); *Pterosicyos* Brandege (1914); *Sechiopsis* Naudin (1866); *Sechium* P. Browne (1756); *Sicyosperma* A. Gray (1853).

Monoecious, annual, or perennial vines, climbing or trailing, up to 10 m long, with



*Sicyos edulis*, ♂ flower, photo by P. Acevedo.

fibrous to tuberous roots. Leaves simple, angulate or lobed, petiolate (rarely sessile). Tendrils simple or (2–) 3–5 (6)-fid, often with long, stout axis. Flowers small, white or yellowish green; male flowers in racemes or panicles (rarely umbels); female flowers solitary, in groups of 2–5 or in dense capitula of up to 40 flowers. Receptacle-tube (broadly) campanulate, in some species with pouch-like nectaries at the base, sepals 5, dentiform or linear, very small; corolla rotate with five triangular to ovate-triangular, rarely bifurcate, basally fused petals; stamens 2–5, inserted near the base of the tube,

filaments fused into a central column, the anthers all monothealous, or two anthers bithealous and one monothealous, all commonly fused into a central head, the thecae straight, duplicate, sigmoid or flexuous; ovary ovoid to fusiform, usually pubescent to setose, rarely winged or angular, with a solitary, pendent ovule, the styles short or slender, with (2–) 3 dilated, often reflexed stigmata. Fruits dry or fleshy, indehiscent, solitary or in capitula, small or medium-sized, globose, ovoid, obovoid, pear-shaped, fusiform, winged, or 3–4-angled, glabrous or villous, sometimes armed

with retrorse barbs, pedicellate. Seed solitary, ovoid, tumid or compressed, sometimes germinating inside the fruit; testa smooth or crustaceous.

**Distinctive features:** Monoecious, mostly annual climber with greenish white flowers, anthers commonly fused into a central head, fruits often in dense capitula, fusiform, winged, or 3–4-angled, often villous or armed with retrorse barbs, single-seeded.

**Distribution:** A primarily continental American genus of 60–70 species with some species in the Pacific Islands and SE Australia; 39 species in the Neotropics, distributed from Mexico to Bolivia and SE Brazil, including Cuba and Hispaniola; humid forests and moist disturbed habitats; 0–2,000 m. *Sicyos polyacanthus* Cogn. has been introduced in Africa and the *chayote* or *xuxu*, *Sicyos edulis* Jacq., a species native to Mexico, is cultivated as a vegetable throughout the Tropics and Subtropics, sometimes becoming naturalized.

**SIOLMATRA** Baillon, Bull. Mens. Soc. Linn. Paris 1: 458. 1885.

Dioecious, liana to 10 or more meters long, often with a tuberous base. Leaves



*Siolmatra* sp., photo by P. Acevedo.

trifoliolate, 5-palmate-compound or 5-lobed, the lateral leaflets asymmetric; petiole with a basal ring-shaped callus.

Tendrils apically bifid, coiling above and below the branching point, sometimes with adhesive pads. Flowers in panicles.

Receptacle-tube saucer-shaped with three

small sepals; corolla white, contorted with five unguiculate, obovate petals; stamens 5, inserted at the base of the tube, filaments short, free, the anthers monothealous with straight, horizontal

thecae; ovary obconical, subtrigonus, trilocular at the apex and unilocular at the base, with 3 placentae, each contain two pendent ovules, styles 3, with bilobed, reniform stigmata. Fruit a pendent, obconical-subtrigonus, subwoody-crustose capsule up to 5 cm long, truncate at apex, dehiscent by a triradiate, apical split. Seeds strongly compressed, ellipsoid; testa yellowish brown, finely verrucous, the margin with ~2 cm long, membranous wing along the chalazal-micropyle axis.

**Distinctive features:** Perennial dioecious climber with apically bifid tendrils coiling above and below the branching point, compound leaves and a callus ring at the petiole base; fruit a crustose, truncate capsule, opening through the dissolution of the apical wall; seeds many, winged.

**Distribution:** A neotropical genus of three species (one undescribed) distributed throughout most of Brazil, Ecuador, Peru, Bolivia, Paraguay and NW Argentina; moist or wet evergreen or deciduous forests; 100–710 m.

**TECUNUMANIA** Standley & Steyermark, Publ. Field Mus. Nat. Hist., Bot. Ser. 23: 96. 1944.

Dioecious, perennial vines, several meters long. Leaves simple, ovate-cordate and palmately



*Tecunumania quetzalteca*. A. Fruit. B. Pistillate flower. Photos by B. Hammel.

5-lobed; petiolate.  
Tendrils 2-(4)-fid.  
Flowers large,  
solitary. Receptacle-  
tube campanulate  
with five linear  
sepals; corolla  
yellow, rotate, with

five obovate, petals that are fused at the base; stamens 3, inserted near the base of the tube, filaments free but closely appressed, the anthers bithecous, connate into a globose head with triplicate thecae; ovary globose with many horizontal ovules, style elongated with 3 bilobed stigmata. Fruit fleshy, subglobose, 7–8 cm long, indehiscent, ripening dark green. Seeds many, 6–7 × 4–5 mm, compressed; testa pale yellowish brown, densely appressed hairy.

**Distinctive features:** Perennial dioecious climber with palmately 5-lobed leaves, large, solitary, yellow, campanulate flowers and subglobose 7–8 cm long dark green pepo with pale yellowish brown seeds with densely appressed hairy testa.

**Distribution:** A neotropical genus of two species with disjunct distribution: *T. quetzalteca* Standl. & Steyerl. is known from Mexico, Guatemala and Costa Rica, while the recently described *T. stotheriae* Cornejo & H. Schaefer is known from the western Andean slopes of Ecuador; wet montane forests; 600–700 m.

**WILBRANDIA** Silva Manso, Enum. Subst. Brazil. 30. 1836.

Monoecious or dioecious, perennial vines, climbing or trailing, with woody rootstock.



*Wilbrandia longisepala*, photo by P. Acevedo.

Leaves simple, entire to palmately 3–7-lobed, petiolate. Tendrils simple. Flowers small and white; male flowers in racemes or spikes; female flowers solitary or in dense, 2–8 flowered, axillary clusters. Receptacle-tube green, 5–6 mm long, sepals 5, lanceolate, 2–3 mm long; corolla yellowish,

the 5 petals oblong to lanceolate, c. 3 mm long, fused at the base, papillose; stamens 3, inserted



on the upper third of the tube, filaments very short, free, two anthers bithecal, one monothealous, coherent into a central head, thecae straight; ovary ovoid-oblong, rostrate with two or three placentae and many, horizontal ovules, the style 2–3 mm long with 2 bifid stigmata or 3 simple ones. Fruit an ovoid-conical, slightly angled berry,  $\sim 2 \times 1.5$  cm, sessile in the leaf axils, rostrate. Seeds many, ovate to oblong, compressed,  $\sim 5$  mm long with distinct margin, in small mucilaginous translucent pockets.

**Distinctive features:** Berries ovoid-conical,  $\sim 2$  cm long, sessile in the leaf axils, rostrate.

**Distribution:** An eastern South American genus of five species distributed from NE Brazil south to W central and SE Brazil, Paraguay and northern Argentina; in rainforest and secondary scrubs; 600–1,000 m.