

# GUIDE TO THE GENERA OF LIANAS AND CLIMBING PLANTS IN THE NEOTROPICS

## VERBENACEAE

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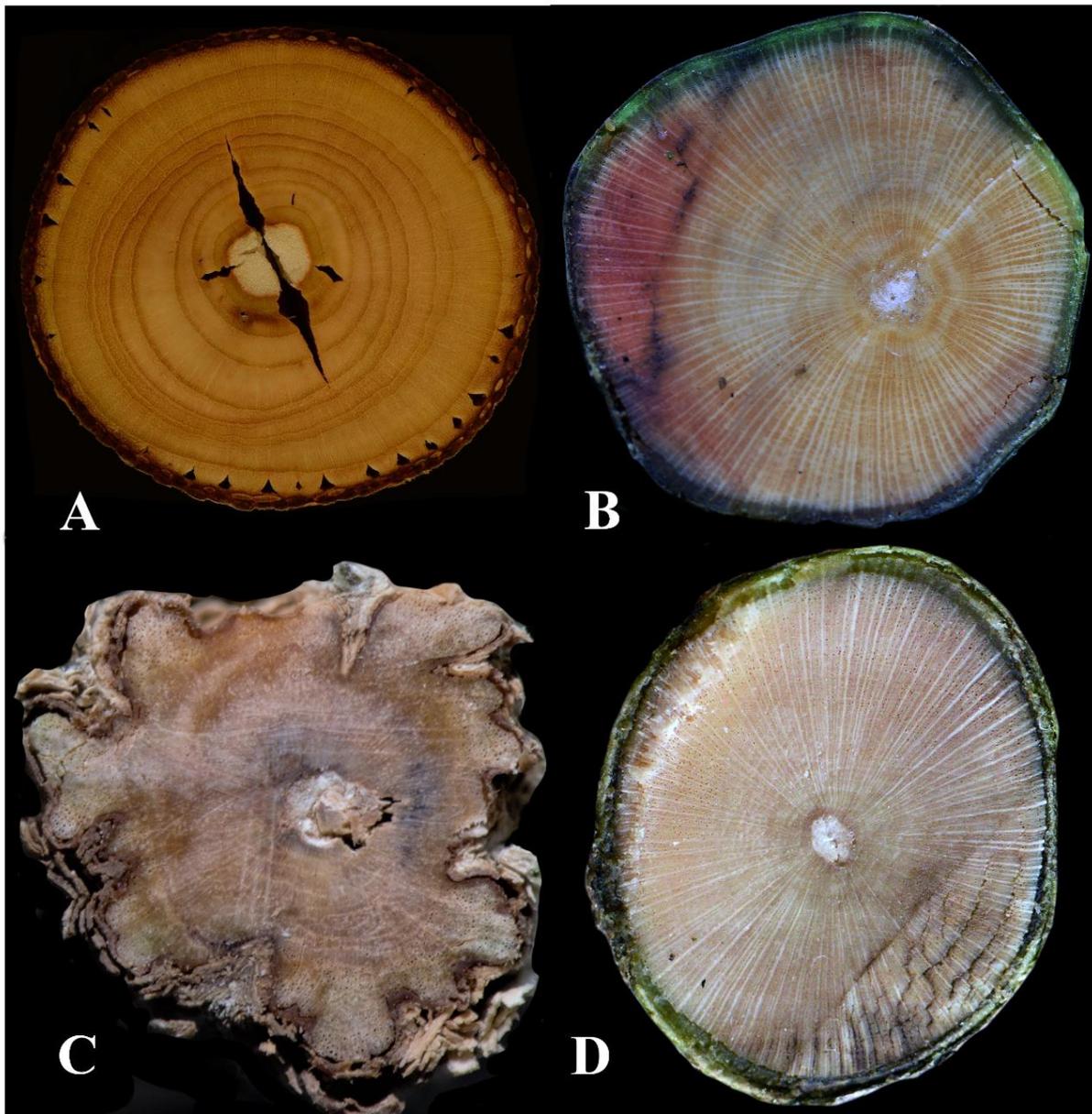
*Petrea* sp., photo by P. Acevedo

A pantropical family extending to warm temperate regions, of shrubs, trees, lianas and less often herbs, commonly aromatic; with 33 genera and about 910 species. Twining lianas are restricted to *Petrea*, while scrambling lianas or subshrubs are found in *Citharexylum*, *Duranta*, and *Lantana*. Verbenaceae are represented in the Neotropics by 24 genera and about 710 species, of which only 22 species are consistently reported as lianas or climbing plants, most of which belong to the genus *Petrea*.

**Diagnosics:** Leaves opposite (sometimes aromatic), simple, exstipulate; stems commonly quadrangular; corolla gamopetalous; *Citharexylum* may be confused with *Aegiphila* (Lamiaceae) but it is distinguished by the racemose inflorescence (vs a cyme or glomerule). Sterile *Petrea* may be confused with sterile *Aegiphila* and may be confused with members of Malpighiaceae, but leaves are devoid of glands, and indument not T-shaped.

## General Characters

1. **STEMS.** Of all neotropical climbing Verbenaceae, only *Citharexylum* and *Petrea* produce stems with substantial secondary growth. Young stems are often quadrangular, but becoming cylindrical, reaching 3-10 m in length and up to 8 cm in diameter; cross sections in *Citharexylum* and *Petrea* are regular, often with a square medulla, a cylindrical vascular cylinder traversed by numerous conspicuous, narrow rays (fig. 1a, b & d); vessels are narrow (fig. 1a-d); climbing species of *Lantana* have deeply fluted stems (fig. 1c).
2. **EXUDATES.** Exudates are inconspicuous in all genera.
3. **CLIMBING MECHANISM.** Lianas and vines in this family are either scramblers or twiners, and commonly have short lateral plagiotropic or hanging branches.
4. **LEAVES.** Leaves are opposite and simple, petiolate, and exstipulate in all neotropical vines.
5. **INFLORESCENCES.** Terminal racemes or axillary long-peduncled heads, never cauliflorous.
6. **PEDICELS.** Pedicels in *Petrea* are long, but short to sessile in other genera.
7. **FLOWERS.** Flowers bisexual, zygomorphic; calyx gamosepalous, tubular, commonly 5-dentate; corolla gamopetalous, 5-merous, salverform or bilabiate; stamens 4 (usually 2 shorter), the filaments adnate to the corolla tube alternating with the lobes, inserted; ovary superior, syncarpous, bi-carpellate, each carpel falsely partitioned into two locules, the style terminal, long, filiform with 2 unequal stigmatic branches; ovules 2 or 4, 1 per locule.
8. **FRUITS.** Fruit drupaceous, indehiscent or splitting into 2-4 pyrenes or mericarps.



**Figure 1.** Stem cross sections of Verbenaceae. **A.** *Citharexylum ovatifolium*, section from dry material. **B.** *Petrea sp.*, freshly cut stem. **C.** *Lantana sp.*, asymmetrical, deeply fluted stem, freshly cut stem. **D.** *Petrea sp.*, freshly cut stem Photos by P. Acevedo.

## KEY TO THE GENERA

1. Twining lianas; leaves commonly sub-fragile; calyx and corolla of same color (violet); calyx of free, long, divaricate sepals, nearly as long as the corolla ..... *Petrea*
1. Scrambling vines or lianas; leaves coriaceous; calyx and corolla of different colors; much shorter than the corolla ..... 2
2. Plants armed with simple, axillary spines; calyx acrescent and enclosing the fruit ..... *Duranta*
2. Plants unarmed; fruits not enclosed by an acrescent calyx ..... 3
3. Leaves entire, non-aromatic; inflorescence of distal racemes ..... *Citharexylum*
3. Leaves serrate-crenate, aromatic; inflorescence of axillary, long-peduncled heads ..... *Lantana*

## GENERIC DESCRIPTIONS

**CITHAREXYLUM** Jussieu in Linnaeus, Sp. Pl. 625. 1753.



*C. ovatifolium*, photo by P. Acevedo

Trees, shrubs or very rarely scrambling lianas; stems commonly quadrangular when young, cylindrical when mature, reaching 3-8 m in length and about 8 cm in diam.; cross sections with numerous, conspicuous, narrow rays and a large, quadrangular medulla (indicating that young stems were quadrangular). Leaves opposite; simple, entire or slightly undulate, with pinnate venation; petioles ca. 2 cm long. Inflorescences of distal racemes; bracts minute, acicular. Calyx cupular, truncate to nearly 5-lobed; corolla actinomorphic, salverform, 5-lobed, white; stamens 4 included, epipetalous; staminode 1; ovary superior, 2-locular, each locule with 2 ovules, style terminal, included, with 2 stigmatic, ovoid, branches. Drupes fleshy, orange, red, purple, commonly ca. 1 cm long; seeds 4.

**Distinctive features:** Scrambling lianas with racemose inflorescences; fruits fleshy, with a cupular calyx at the

base. Vegetatively similar to *Aegiphila* (Lamiaceae) but distinguished by the racemose inflorescences (vs. cymose in *Aegiphila*).

**Distribution:** A genus of about 100 species native to the Neotropics, with only one species consistently reported as a vine; distributed from Central to SW Mexico in humid forests above 2000 m elevation.

**DURANTA** Linnaeus, Sp. Pl. 637. 1753.



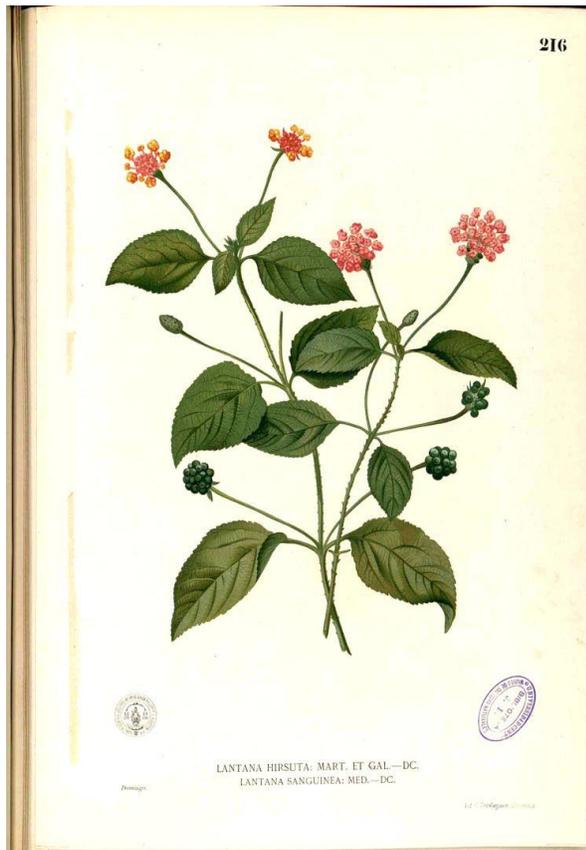
*D. costaricensis*, photo from Field Museum

Erect, decumbent or rarely scrambling shrubs or small trees; vines with straight short axillary spines. Stems commonly obtusely quadrangular, sub-flattened at the nodes. Leaves non-aromatic, opposite, entire (in vine species), with pinnate venation; petioles long to short, glandless. Inflorescence of axillary racemes or distal frondobracteate panicles, with decussate or sub-opposite flowers along the axes; bracts minute, caducous. Calyx tubular to campanulate, conspicuously 5-costate, crowned by 5 minute teeth; corolla salverform, straight, bluish, lavender or white, 5-lobed; stamens 4, epipetalous, included; staminode 1; gynoecium with 4 fertile carpels, style slender, stigma bilobed. Fruit a drupe covered by an acrescent calyx; seeds commonly 2 per carpel.

**Distinctive features:** Scrambling shrubs with opposite, axillary spines; leaves opposite, entire; fruit covered by acrescent calyx.

**Distribution:** A neotropical (except the Amazon basin) genus with 20 species, 1 of which (*D. costaricensis* (Donn.-Sm.) Standl.) is consistently reported as a liana; found in Costa Rica and Panama.

**LANTANA** Linnaeus, Sp. Pl. 626. 1753, (nom. cons.).



*L. hirsuta*, photo from Blanco, Fl. de Filipinas

Erect or rarely scrambling, aromatic shrubs, with short, opposite, lateral branches. Stems quadrangular, sometimes with dispersed prickles, becoming cylindrical with age, vines up to 6 m long. Leaves opposite, serrate-crenulate, with pinnate venation; petioles long to short, glandless. Inflorescence of axillary, long-peduncled heads, with sessile flowers, pseudo-spirally arranged; bracts minute, imbricate. Calyx tubular, very short; corolla salverform, variously colored but often yellow, orange, pink, or lavender, with 4 unequal lobes, the tube elongate, slightly curved; stamens 4, included; gynoecium bi-carpellate but only one carpel developing, style slender, with 2 equal stigmatic branches. Fruit a fleshy drupe, small, globose, oblate or bilobed, commonly bluish black, of 2 nutlets.

**Distinctive features:** Scrambling shrubs, with square stems, commonly armed with prickles; leaves serrate-crenate, aromatic; inflorescences of heads.

**Distribution:** A nearly pantropical genus with about 110 species; 98 species in the Neotropics, 7 of which are reported as climbers; dry lowland scrubs or forests, and disturbed areas.

**PETREA** Linnaeus, Sp. Pl. 626. 1753.



*P. bracteata*, photo by P. Acevedo

Trees, shrubs, or twining lianas; stems glabrous or pubescent, cylindrical at maturity, reaching 3-7 m in length and 2-3 cm in diam.; cross section with regular anatomy, vascular cylinder with narrow vessels, traversed by numerous, conspicuous, narrow rays (fig. 1b & d). Leaves simple, opposite, sub-opposite, or whorled, usually scabrous, with entire or slightly crenate margins, petiolate. Flowers bisexual, in axillary or terminal racemes. Calyx with a short cylindrical or campanulate tube and commonly with 5 elongate lobes; corolla, salverform, blue, violet, or less frequently white, the tube urceolate, cylindrical, or infundibuliform, the lobes 5, expanded; stamens 4, the filaments didynamous, adnate at the middle portion of the corolla; ovary superior, with a single fertile carpel, bilocular, each locule with a solitary ovule; style terminal, the stigma capitate. Fruit drupaceous, with 2 pyrenes, completely covered by the persistent calyx.

**Distinctive features:** Twining lianas, leaves opposite or verticillate, often scabrous; inflorescences of long, hanging racemes with showy flowers.

**Distribution:** A genus of 13 species, native to the Neotropics, 10 of which are lianas; in moist, seasonally flooded or non-flooded primary or secondary forests of the lowlands.

## RELEVANT LITERATURE

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## PICTURE VOUCHERS

Figure 1.

A. *Citharexylum ovatifolium* Greenm. (Acevedo 16321).

B. *Petrea* sp. (Acevedo 17005).

C. *Lantana* sp. (Acevedo 16934).

D. *Petrea* sp. (no voucher).