

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

PLANTAGINACEAE

By Mark T. Strong (Jan 2021)



Russelia syringifolia Schlttdl. & Cham., photo by J. Amith

A widely distributed family of primarily herbs, subshrubs or shrubs with about 100 genera and ca. 1,900 species worldwide. In the Neotropics, they are represented by about 45 genera and ca. 400 species. Five genera and 14 species are treated below as climbing plants. These occur in a diversity of habitats from desert scrub to montane cloud forests.

Diagnosics: In vegetative condition, climbing Plantaginaceae have stems that are quadrangular or terete; leaves are opposite, alternate or sometimes verticillate, glabrous or glandular-pubescent, simple, and stipules are absent. In the order Lamiales, the quadrangular stems and simple opposite leaves of some Plantaginaceae might be confused with Acanthaceae, Gesneriaceae, Lamiaceae and Verbenaceae.

Acanthaceae generally have ovaries with hook-like placental tissue and capsules with explosive dehiscence while in Gesneriaceae, ovaries are unilocular with parietal placentation. Lamiaceae and Verbenaceae have 2-ovulate ovaries and the fruit is a 4-parted schizocarp or dry indehiscent drupe.

GENERAL CHARACTERS

1. **STEMS.** Quadrangular (sometimes winged) or terete in cross section, commonly solid, but hollow in some species of *Russelia* (e.g. *R. campechiana* Standl.; fig. 1a), xylem with deep phloem wedges in species of *Russelia* (e.g., *R. contrerasii* B.L. Turner; fig. 1b). Vessels narrow and commonly radially disposed (Metcalf & Chalk, 1957). No visible exudates reported for the group.
2. **PUBESCENCE.** Glabrous or glandular-pubescent.
3. **LEAVES.** Alternate, opposite, verticillate or opposite proximally and alternate distally, the blades deltoid to cordiform, hastate or sagittate at base with palmate venation, or sometimes linear to lanceolate or ovate-lanceolate with pinnate venation, entire or with dentate margins, glabrous or glandular-pubescent; stipules absent.
4. **CLIMBING MECHANISMS.** Climbing *Russelia* are scrambling vines or shrubs with clambering branches; *Lophospermum*, *Murandella*, and *Rhodochiton* have prehensile petioles (fig. 1c & d), while *Murandya* has prehensile petioles and pedicels.
5. **INFLORESCENCES.** Generally axillary, of solitary flowers, axillary or terminal cymes or racemes in *Russelia*.
6. **FLOWERS.** Flowers bisexual; calyx 5-lobed; corolla gamopetalous, bilabiate, 5-lobed; fertile stamens 4, didynamous, often with a filamentous staminode which is sometimes rudimentary or absent; ovary superior, 2-carpellate, 2-locular with many ovules borne on an axial placenta, the locules equal or unequal, glabrous or glandular-pubescent.
7. **FRUITS.** Two-locular, many-seeded capsules with loculicidal or poricidal dehiscence; seeds 2-winged, circumalate or wingless, the surface reticulate-foveolate or -alveolate, minutely tuberculate, or cristate.

USES

Some species of the genera treated below that have showy flowers are cultivated for ornamental purposes but otherwise are of little or no economic importance.

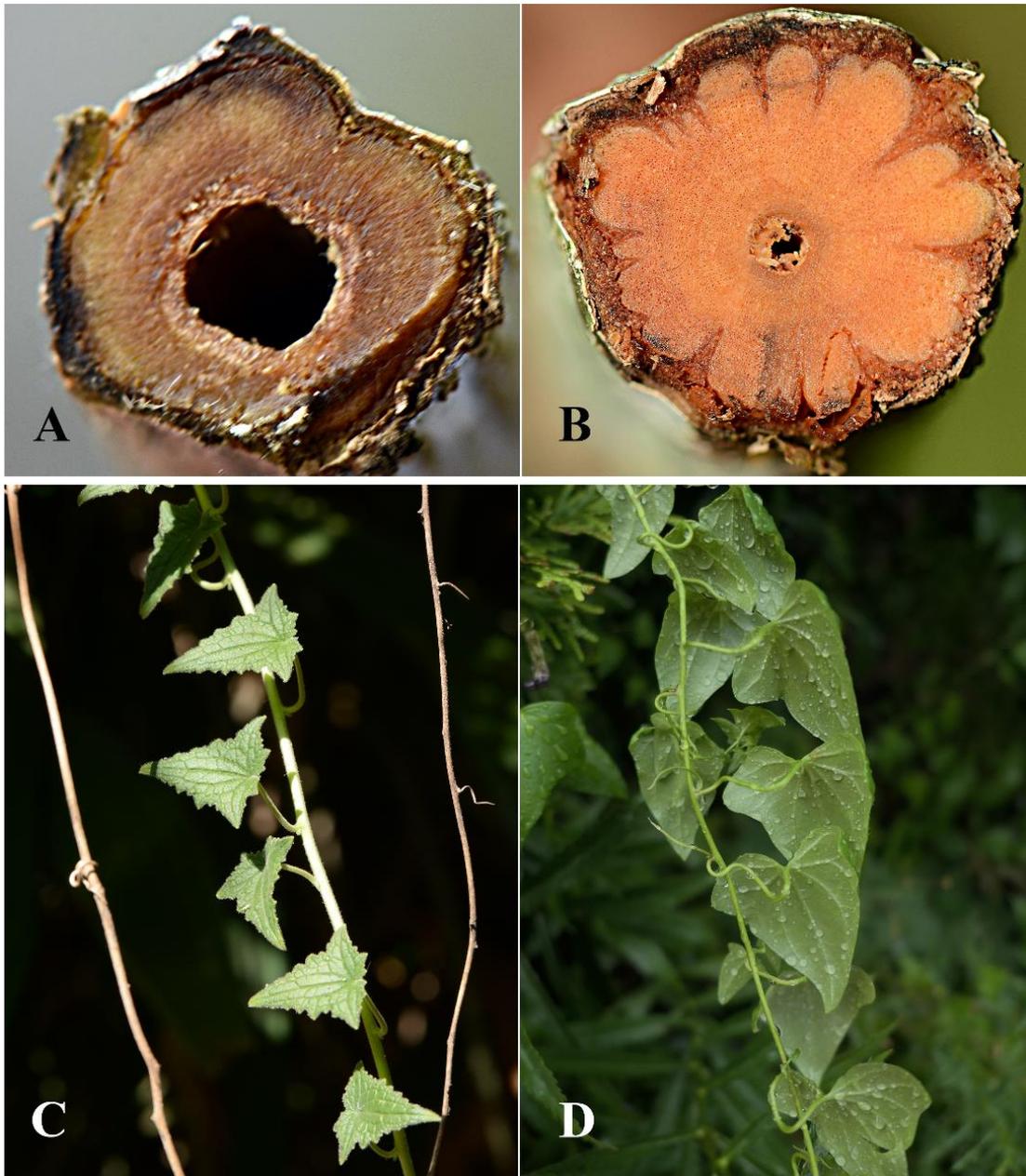


Figure 1. A. Stem cross section of *Russelia campechiana* with hollow center (16449). B. Stem cross section of *Russelia contrerasii* showing deep phloem wedges (16446). C. *Lophospermum erubescens* with prehensile petioles. D. *Maurandya scandens* with prehensile petioles. Photos by P. Acevedo.

KEY TO THE GENERA

1. All leaves opposite or verticillate; inflorescence of cymes or racemes; pedicels bracteolate *Russelia*
1. All leaves alternate or opposite proximally and alternate distally; inflorescence of solitary flowers; pedicels ebracteolate2
2. Calyx lobes narrowly to broadly ovate, distinct and basally imbricate or united and basally connate 1/2 to 2/3 length, often enlarging in fruit; seeds 2-winged3
2. Calyx lobes linear to lanceolate, basally connate; seeds not winged.....4
3. Flowers horizontal to ascending; calyx not inflated, the lobes distinct, basally imbricate; corolla bilabiate*Lophospermum*
3. Flowers pendent; calyx subinflated, the lobes connate, united 1/2 to 2/3 its length; corolla subtubular *Rhodochiton*
4. Corolla throat open; capsule ovoid, the locules subequal *Maurandya*
4. Corolla throat closed; capsule globose, the locules markedly unequal*Maurandella*

GENERIC DESCRIPTIONS

LOPHOSPERMUM D. Don, Philos. Mag. J. 67: 222. 1826.

Perennial scandent herbs, suffrutescent. Stems climbing by means of twining petioles. Leaves alternate, sparsely pubescent or glandular-pubescent, deltate to cordiform, with palmate primary veins, acute or mucronate at apex. Inflorescence of solitary, axillary flowers, the peduncles ascending to horizontal, ebracteolate. Calyx urceolate, the lobes distinct or connate at base, narrowly to broadly ovate, basally imbricate, planate or recurved, often enlarging in fruit; corolla unequally bilabiate, red, violet or dark purple, sparsely glandular-pubescent externally, the lobes rounded or broadly acute, the upper two lobes often recurved at maturity; fertile



L. erubescens D. Don, photo by D.R. Herbst

stamens included, the filaments incurved, the staminode 1, variable in length; ovary bilocular, glabrous or glandular-pubescent; style terete, included, glabrous or glandular pubescent at base, the stigma recurved. Fruit an ovoid or globose capsule. Seeds rounded, 2-winged, tuberculate with irregular ridges.

Distinctive features: Characterized by their climbing or clambering habit with twining petioles. Similar to *Rhodochiton* but the flowers are horizontal to ascending, calyx is not inflated with lobes that are basally imbricate, planate or recurved, and the corolla is bilabiate.

Distribution: A genus of 7 species occurring from Mexico to Guatemala; oak and oak-pine forests on rock outcrops, cliffs, canyon walls, in clearings, and along forest margins and roadcuts; 500-2400 m. Introduced elsewhere.

MAURANDELLA (A. Gray) Rothmaler, Feddes Repert. Spec. Nov. Regni Veg. 52: 26. 1943.

Perennial, herbaceous or suffrutescent vines, climbing by means of twining petioles; glabrous, fibrous rooted. Leaves alternate, deltoid, hastate to sagittate with entire margins, the primary veins palmate. Inflorescence of solitary, axillary flowers, the peduncles slightly winged proximally, ebracteolate; calyx deeply lobed, the lobes subequal, linear; corolla unequally bilabiate, the lobes rounded at apex, often recurved at maturity, blue, pink, red, or violet distally,



M. antirrhiniflora, photo from Annie's Annuals & Perennial webpage

the limb closed at the throat with well-developed basal palate, the tube not spurred or gibbous at base; fertile stamens included, adnate at base to corolla, the filaments glandular-pubescent, staminode 1, filamentous; ovary glabrous, the two locules markedly unequal; stigma 2-lobed. Fruit a globose capsule with asynchronous, loculicidal dehiscence, the smaller locule dehiscing much later than the larger one. Seeds ovoid to oblong-polygonal, subasymmetrical, tuberculate with irregular ridges, wings absent.

Distinctive features: Similar to *Maurandya* but the throat of the corolla is closed, and the globose capsule has markedly unequal locules.

Distribution: A monospecific genus represented by *Maurandella antirrhiniflora* (Humb. & Bonpl. ex Willd.) Rothm. naturally occurring from the southwestern United States to central Mexico and Cuba, introduced in the West Indies, Colombia, Ecuador, Brazil and other areas of tropical America as a garden plant; in ravines, coastal dunes, and desert flats at sea level to 2600 m elevation.

MAURANDYA Ortega, Nov. Pl. Descr. Dec. 21. 1797.



M. scandens, photo by P. Acevedo

Perennial vines, suffrutescent, climbing by means of twining petioles and pedicels; fibrous rooted. Leaves alternate, deltoid, hastate to sagittate or cordiform with entire or broadly crenate margins, the primary veins palmate. Flower solitary, axillary, the peduncles winged proximally, ebracteolate; calyx deeply lobed, the lobes subequal, lanceolate, distinct, the basal margins imbricate, glabrous or glandular-villous; corolla unequally bilabiate, the lobes rounded at apex, often recurved at maturity, blue to violet or pink, the limb open at the throat, the basal palate lacking; fertile stamens included, the filaments incurved, often enlarged distally, the staminode rudimentary; ovary glabrous, the locules subequal; stigma conical, shallowly grooved. Fruit an

irregularly ovoid capsule with asynchronous dehiscence, the smaller locule dehiscing much later than the larger one. Seeds symmetrical, tuberculate with irregular ridges, wings absent.

Distinctive features: The open throat of the corolla and ovoid capsule with subequal locules characterize this genus in the tribe Antirrhineae subtribe Maurandyinae.

Distribution: A genus of 2 species characterized by their scandent or clambering habit and twining leaf petioles and flower peduncles, represented by *Maurandya barclayana* Lindl.(endemic to Mexico) and *Maurandya scandens* (Cav.) Pers. which occurs from Mexico to Honduras in deciduous subtropical or tropical forests on rocky slopes, arroyos, ravines, and disturbed habitats at 1200-2400 m elevation. Introduced as a garden plant in other parts of the Neotropics.

RHODOCHITON Zucarini ex Otto & A. Dietrich, Verh. Vereins. Beförd. Gartenbaues Königl. Preuss. Staaten 10: 152. 1834.



R. astrosanguineum (Zucc.) Rothm., photo by Nauna - Own work

Scrambling or clambering vines, suffrutescent, climbing by means of twining petioles, sometimes forming adventitious roots, sparsely glandular-pubescent to glabrescent. Leaves alternate, long-petiolate, cordiform or deltate, with palmate primary veins, the margins mucronate-dentate or subentire with minute teeth. Flowers solitary, axillary, pendent on elongate pedicels, glandular-pubescent; calyx shallowly lobed, inflated and campanulate, the lobes equal, basally connate $1/2$ to $2/3$ its length, broadly acute at apex; corolla subtubular or subequally bilabiate, the lobes rounded at apex, often recurved at maturity, dark purple, glandular-pubescent externally, ventral plicae sparsely puberulent, pink or light purple, the limb light purple,

open at the throat, the basal palate lacking; stamens included, the filaments incurved or straight, the staminode rudimentary; ovary locules equal, glandular-pubescent; style included or exerted, glandular-pubescent at base; stigma recurved or straight. Fruit a globose capsule. Seeds subsymmetrical, 2-winged, tuberculate.

Distinctive features: Similar to *Lophospermum* but the flowers are pendent on elongate peduncles, the calyx is subinflated with connate lobes that are united $1/2$ to $2/3$ of its length, and the corolla is subtubular, not bilabiate.

Distribution: A genus of 3 species characterized by their scandent or clambering habit and twining leaf petioles occurring from Mexico to Guatemala in montane cloud forests at 1300-3500 m elevation.

RUSSELIA Jacquin, Enum. Syst. Pl. 6, 25. 1760.



R. maculosa Lundell, photo by J. Amith

Perennial suffrutescent herbs or subshrubs, sometimes scrambling vines or shrubs with clambering branches. Stems quadrangular with wing-like extensions or terete. Leaves opposite or verticillate, sessile or short-petiolate, linear-lanceolate to ovate, pinnately veined, acuminate at apex, with entire or dentate margins, sometimes

reduced and needlelike or scale-like. Inflorescence axillary, cymose, usually pedunculate, 2-many-flowered, the flowers pedicellate, bracteolate. Calyx deeply lobed, the lobes ovate, acuminate to subulate, connate at base; corolla tubular or campanulate, with an emarginate upper lip and 3-lobed lower lip, the lobes rounded, bright red or variegated maroon, pink and white, the tube not spurred or gibbous at base; fertile stamens included, inserted on corolla just above the base, the staminode 1 and filiform, or absent; ovary ovoid to globose, with white membranous hairs internally; stigma subcapitate. Fruit a globose capsule, septicidally dehiscent. Seeds small, ovoid, dark brown, wingless.

Unique features: The ovaries and capsules have copious white membranous hairs internally.

Distribution: A genus of about 46 species, four of which are reported as climbers, *Russelia campechiana* Standl., *Russelia maculosa* Lundell, and *Russelia syringifolia* Schtdl. & Cham. occur in Mexico and Central America, and *Russelia sarmentosa* Jacq., ranges to Colombia, Cuba, and French Guiana, introduced elsewhere.

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