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

SCROPHULARIACEAE

By Mark T. Strong (Jan 2021)

A widely distributed family of shrubs, subshrubs, and herbs, rarely small trees or scrambling shrubs, with about 64 genera and ca. 2,040 species worldwide. As currently circumscribed, Scrophulariaceae is most diverse in the Old World, with its center of distribution in Africa. In the Neotropics, there are about 9 genera and ca. 113 species. Of these, only the genus *Buddleja* is represented by several scandent or scrambling species.

Diagnostics: Although *Buddleja* is morphologically quite variable, the climbing species in the Neotropics have stems that are quadrangular; leaves are opposite, decussate, simple, ovate, elliptic, or lanceolate, with entire margins, and bear a dense whitish or grey tomentum that is intermixed with stellate and glandular hairs; stipules are early caducous.

GENERAL CHARACTERS

1. STEMS. Quadrangular or obtusely quadrangular in cross section. Bark shaggy in old stems.

2. PUBESCENCE. Leaves and inflorescence densely whitish or grey tomentose with stellate and glandular hairs intermixed.

3. LEAVES. Opposite, decussate, the blades simple, ovate, elliptic, or lanceolate, with pinnate camptodromous venation, the margins entire or crenate; stipules early caducous.

4. CLIMBING MECHANISMS. Scrambling or leaning, vine-like shrubs, with profusely decussate branching.

5. INFLORESCENCES. Terminal or rarely axillary, racemiform or paniculate thyrses, with flowers in dichasia, proximal dichasia pedunculate, subtended by bracts, distal dichasia sessile, head-like.

6. FLOWERS. Flowers usually fragrant, bisexual, actinomorphic, sessile or pedicellate; calyx 4-lobed, tubular or campanulate, the lobes connate proximally; corolla 4-lobed, gamopetalous, slightly bilabiate, salverform, campanulate or tubular; stamens 4, inserted on corolla tube distally, included, rarely exserted; ovary superior, 2-locular, rarely 4-locular with many ovules borne on an axial placenta; stigma clavate or globose, slightly bilobed.

7. FRUITS. Two-locular, many-seeded capsules with septicidal or loculicidal dehiscence, rarely indehiscent and drupe-like or berries; seeds small, ovoid to ellipsoid, often winged, with reticulate testa.

USES

For centuries, Neotropical *Buddleja* have been used by native peoples for medicinal purposes. Many of the medicinal properties found in stems and leaves can be attributed to iridoid, glycoside, and flavonoid compounds. Flavonoids can have a diuretic effect or act as an anti-inflammatory. Abundant iridoid glycosides act as an antiseptic to prevent or treat infections. Other disorders and conditions treated include skin, nose, throat, lung, hemorrhaging, digestive, arthritis, rheumatism, snakebite, and heart problems. One of the scrambling species treated here, *B. brachiata*, has been used as a diuretic. The species, *B. davidii* Franch. and *B. stachyoides* Cham. & Schltdl. have been used as a fish poison probably due to sesquiterpenes found in these two species. A dozen or more species of *Buddleja* have been cultivated. Of these, *B. coriacea* J. Rémy from Peru and Bolivia, *B. globosa* Hope from Chile and Argentina and the widespread Andean species, *B. incana*, Ruiz & Pav. are the most commonly cultivated in the Neotropics for ornamental and other purposes. Other uses of the multipurpose trees *B. incana* and *B. coriacea* include wind breaks around agricultural fields, construction, cabinet making, fence posts, and an important source of charcoal. The high carbon to nitrogen ratio of the leaves and wood readily decomposes at high altitude and the highly organic material produced is widely used as a fertilizer.

GENERIC DESCRIPTION

BUDDLEJA Linnaeus, Sp. Pl. 112. 1753.

B. madagascariensis Lam., photo by Forest & Kim Starr, USGS

Shrubs, sometimes trees or rarely scrambling or leaning shrubs; densely tomentose with whitish or grey stellate hairs interspersed with glandular hairs. Stems terete to quadrangular. Leaves opposite, decussate, petiolate, the blades ovate, elliptic, or lanceolate, with entire margins; stipules early caducous. Inflorescences terminal or rarely axillary, racemiform or paniculate thyrses, with flowers in congested dichasia, proximal dichasia pedunculate, subtended by bracts, distal dichasia sessile, head-like. Calyx tubular or campanulate, the lobes shorter than tube, acute and often marcescent at apex; corolla slightly bilabiate, salverform, campanulate or tubular, white, cream, yellow, orange, pink, or purple, often with stellate and glandular hairs externally; stamens sessile or subsessile with very short filaments, inserted distally on corolla tube; ovary 2-locular with axial placentation, the stigma clavate or globose, slightly bilobed. Fruit a many-seeded, septicidal capsule, rarely indehiscent or berries; seeds small, ovoid to ellipsoid, often winged, with reticulate testa.

Distinctive features: The dense whitish or grey tomentum of leaves and inflorescences, opposite, decussate leaves, and sessile or subsessile stamens with short filaments inserted on the corolla distally characterize this genus.

Distribution: There are about 65 species in the Neotropics, four of these have been reported as scandent or scrambling shrubs. Three are native species, *Buddleja brachiata* Cham. & Schltdl. is rare but widespread in eastern Brazil, growing along rivers in disturbed habitats, *B. cardenasii* Standl. ex E.M. Norman is a rare endemic to Bolivia occurring in montane forest at 3000-3100 m

elevation, and *B. multiceps* Kranzl. is widespread but uncommon, occurring from the Colombia-Ecuador border to Cajamarca, Peru at the edge of cloud forests at 2000-3300 m elevation. A third species, *B. madagascariensis* Lam., native to Madagascar, is widely cultivated in subtropical areas and is considered an adventive species in the West Indies, southeastern Brazil, Paraguay, Uruguay, and Argentina.

RELEVANT LITERATURE

Fischer, E. 2004. Scrophulariaceae. Pp. 333-432 in J. D. Kadereit (ed.), Flowering Plants - Dicotyledons, Lamíales (except Acanthaceae including Avicenniaceae). In K. Kubitzki (general editor), The Families and Genera of Vascular Plants, Vol. 7. Springer-Verlag, Berlin.

Norman, E.M. 2000. Buddlejaceae. Fl. Neotrop. Monogr. 81: 1–225. New York Botanical Garden Press, Bronx, N.Y.

POWO. 2020. Scrophulariaceae. Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; http://www.plantsoftheworldonline.org/ Retrieved November 2020.