

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

## HYDRANGEACEAE

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A warm temperate to tropical family of nine genera and approximately 250-270



*Hydrangea anomala*, photo by P. Acevedo

species of shrubs, lianas and rhizomatous herbs, with disjunct distribution in the American and Asian continents, and two species known from the Caucasus and southwestern Europe. Lianas and climbing plants in Hydrangeaceae are restricted to the genera *Hydrangea* s.l. (De Smet et al., 2015) and *Philadelphus*, and represented in the Neotropics by approximately 58 to 68 species of climbing plants. In primary cloud or rain forests, often near small streams, most diverse between 1000 and 2000 m elevation, rarely at sea

level or above 2500 m.

**Diagnostics:** Root-climbing lianas or rarely scrambling shrubs, pubescence of stellate or simple hairs; leaves opposite, simple, entire or serrate; flowers 4 or 5-merous, with (partly) inferior ovary; fruits loculicidal capsules with axial placentation and numerous minute seeds.

## General Characters

1. STEMS. Stems are woody, except for those of the runner shoots (stolons) in *Hydrangea* which are herbaceous. Woody, mature stems are nearly terete, angled, or slightly lobed (fig. 1a) and can reach 1 to 20 cm in diameter and few to 60 m in length (e.g., *Hydrangea*); bark is rough with lenticels in *Hydrangea*, often peeling off in thin linear chunks (fig. 1b); cross sections in some species with shallow phloem wedges or arcs in the periphery of the xylem, and numerous, narrow rays (fig. 1a).
2. EXUDATES. Exudates are colourless and odourless in both genera.
3. CLIMBING MECHANISMS. All neotropical species of *Hydrangea* have adventitious roots on their stolons and stems, whereas the few climbing *Philadelphus* species are shrub-like and their stems find support in the adjacent vegetation.
4. HAIRS. Pubescence in *Hydrangea* is usually present and commonly consists of stellate hairs on stolons, stems, and leaves that are erect or appressed, ranging from white to red and brown. The stellate hairs on the stolons are very curious given that they seem to develop into adventitious roots. Pubescence in *Philadelphus* is of simple, commonly strigose, white to greyish hairs.
5. STIPULES. Absent.
6. LEAVES. Opposite, decussate, simple, with entire or serrate margins, pinnate or plinerved venation.
7. INFLORESCENCES. Cymose, corymbiform, umbelliform or paniculiform, axillary or distal.
8. FLOWERS. Flowers zygomorphic or actinomorphic, functionally unisexual or bisexual; sepals 4-5, free, on distal portion of the hypanthium; corolla of 4-5 free petals; stamens 8-9 or 40-50 (in *Philadelphus*), shorter than the petals, filaments commonly free; ovary (partly) inferior, 2- (3-) or 4-carpellate, plurilocular, with axile placentation, bearing numerous ovules per locule.
9. FRUIT. Apically dehiscent, septicidal, keeled capsules, with numerous minute seeds.



**Figure 1.** *Hydrangea anomala*. **A.** Stem cross section, showing shallow phloem wedges or arcs and numerous narrow rays. **B.** Rough bark with numerous adventitious roots along the dorsal surface of the internodes. Photos by P. Acevedo.



**Figure 2.** Juvenile, root-climbing shoot in *Hydrangea peruviana*. Photo by C. Granados Mendoza.

### KEY TO THE GENERA

1. Plants root-climbing lianas, reaching > 20 m in length; leaves with pinnate venation; inflorescences cymose or umbellate, often with enlarged peripheral flowers; stamens 8-9 ..... *Hydrangea*
1. Plants scramblers, reaching up to 6 m (rarely 20 m) in length; leaves with plinerved venation; inflorescence cymose, sometimes racemiform, lacking enlarged peripheral flowers; stamens 40-50..... *Philadelphus*

## GENERIC DESCRIPTIONS

**HYDRANGEA** Gronovius in Linnaeus, Sp. Pl. 397. 1753.

Dioecious, root-climbing lianas up to 40 m (60 m) high; pubescence when present



*H. trianae*., photo by M.-S. Samain

of simple or stellate hairs; juvenile shoots often pubescent and bearing smaller, dentate leaves (fig. 2); adult shoots glabrous or pubescent, bearing larger and thicker leaves with variable margins, often

produced near the base when juvenile, producing reddish creeping branches with adventitious roots that grow over the forest floor or climb on the stems of host trees; adult stems up to 20 cm diam. at the base. Stolons and branches with stellate pubescence (brownish to reddish, rarely whitish); twigs flexible or brittle, glabrous or with different types of indument. Leaves simple, opposite, decussate, coriaceous, chartaceous or papyraceous, glabrous or variously pubescent, venation pinnate, abaxially with acarodomatia in the axils of secondary veins (exceptionally in axils of tertiary veins), margins entire, dentate, serrate, lobed or undulated, sometimes glandular, petioled. Inflorescences umbel- or panicle-like clusters, distal on short lateral branches, small to large, loosely to densely branched, often with bigger marginal, flowers that have large, petaloid, colored sepals; bracts forming an involucre in bud, whitish, yellowish or greenish, broadly ovate, caducous (leaving noticeable scars); peduncles often with noticeable scars from small, caducous leaves. Flowers unisexual with remnant organs of opposite sex; hypanthium relatively flat to cup-shaped, broad to narrow; sepals 4-5, represented by small

lobes on the hypanthium; petals 4-5, free, flag-shaped, rounded, early caducous, whitish, yellowish, or greenish, rarely pinkish; stamens 8-9, longer than pistils in functionally male flowers, shedding quickly after anthesis; ovary inferior, syncarpous, 2(3-4)-carpellate, longer than the vestigial stamens in functionally female flowers, styles 2(3-4), free, stigmatic surface elongated. Fruit a septicidal capsule, dehiscent apically between the dried pistils, brownish, urceolate, conical or subglobose, as big as the hypanthium, sometimes larger. Seeds numerous, very small.

**Distinctive features:** In the absence of reproductive structures, neotropical *Hydrangea* can be distinguished from root-climbing lianas in other families that have simple, opposite or decussate leaves by the presence of heteromorphic juvenile and adult shoots; leaves with serrate margins; stellate pubescence; and the lack of a coloured exudate.

**Distribution:** A genus of about 100 recognized species distributed in the Asiatic tropics, Indo-Malesia, Hawaiian Islands, North America and the Neotropics from northern Mexico to Argentina and Chile. Currently 26 species are recognized in the Neotropics, but ongoing taxonomic work suggests a total of 50-60 species once our taxonomic revision is finished. In primary forests, commonly in cloud and rain forests, often near small streams, most diverse between 1000 and 2000 m elevation, rarely at sea level or above 2500 m.

**PHILADELPHUS** Linnaeus, Sp. Pl. 470. 1753.

Erect, spreading shrubs, rarely scandent, scrambling over adjacent plants; pubescence of simple, long hairs (strigose), axillary buds commonly evident. Climbing species up to 6 (20) m long. Leaves opposite, simple, ovate to lanceolate, discolored, with plinerved venation (5 main veins); abaxially strigose with prominent veins, margins entire or remotely narrowly dentate, acuminate and apiculate at apex; petioles slender, ca. ¼ the length of the blade. Inflorescence dichasial, 3-florous cymes, distal on short lateral branches or less often axillary and forming a frondo-bracteate raceme-like inflorescence; pedicels ±elongated, pubescent. Flowers 4(5)-merous; hypanthium conical, crowned by the

ovate acuminate sepals, grayish strigose; petals free, white, twice as long as the sepals;



*P. myrtooides.*, from Bettini, Nov. Comment. Acad. Sci. Inst. Bononiensis Vol 4, t. 43. 1840

stamens 13-90 (40-50 in *P. myrtooides*), about ½ the length of petals, filaments commonly free, unequal, anthers oblong, 1-1.2 mm long; ovary partly inferior and fused to the receptacle of hypanthium, 4-locular with axile placentation and numerous ovules, style as long as the stamens, stigmas 4, short to elongated. Fruit a loculicidal, ellipsoid to globose capsule. Seeds minute, numerous.

**Distinctive features:** Arching or scandent shrubs; leaves opposite, plinerved with entire or remotely serrate margins; hypanthium and sepals greyish strigose; petal white; stamens numerous.

**Distribution:** A genus of about 45 species distributed in Central Europe, Temperate Asia, North America, Mexico

and Central America. The genus consists of 23 species in the Neotropics 8 of which are shrubs, sometimes reported as scandent shrubs or vines. Of these, *Philadelphus myrtooides* Bertol. is the species with the southernmost distribution, and is found in the neotropical region of Mexico and in Guatemala; mountains and Cypress groves (Hu 1954); 1200-1930 m. This species is widely cultivated in Central America south to Costa Rica and Panama (Standley & Steyermark, 1946).

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