

HYDRANGEACEAE

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A warm temperate to tropical family of nine genera and ~250–270 species of shrubs, lianas, and rhizomatous herbs, with disjunct distribution in the American and Asian continents, plus two species known from the Caucasus and southwestern Europe. Lianas and climbing plants in Hydrangeaceae are restricted to *Hydrangea* s.l. (De Smet et al. 2015) and *Philadelphus* and are represented in the Neotropics by ~58–68 species of climbing plants. In primary cloud or rain forests, often near streams; most diverse between 1,000 and 2,000 m elevation, rarely at sea level or above 2,500 m.

Diagnosics: Root-climbing lianas or rarely scrambling shrubs or vines, 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.** Woody, except for those of the runner shoots (stolons) in *Hydrangea* which are herbaceous. Woody, mature stems are nearly terete, angled, or slightly lobed (Figure 127) and can reach 1–20 cm in diam. and few to 60 m in length; bark is rough with lenticels in *Hydrangea*, often peeling off in thin linear chunks (Figure 127B); cross sections in some species with shallow phloem wedges or arcs in the periphery of the xylem, and numerous, narrow rays (Figure 127C).
2. **EXUDATES.** Exudates are colorless and odorless 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, scramblers that lean on the adjacent plants or structures.

4. HAIRS. Pubescence in *Hydrangea* is usually present and commonly of erect or appressed stellate hairs on stolons, stems, and leaves, these are white to red or brown. The stolons have stellate hairs that seem to develop into adventitious roots. Pubescence in *Philadelphus* is of simple, commonly strigose, white to greyish hairs.
5. LEAVES. Opposite, decussate, simple, with entire or serrate margins, with pinnate or plinerved venation; exstipulate.
6. INFLORESCENCES. Cymose, corymbiform, umbelliform or paniculate, axillary or distal.
7. 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 in *Hydrangea* 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.
8. FRUIT. Apically dehiscent, septicidal, keeled capsules, with numerous minute seeds.

Key to the genera of climbing Hydrangeaceae

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

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

Dioecious shrubs or root-climbing lianas, few to 40 (60) m in length; pubescence when present, of simple or stellate hairs (brownish to reddish, rarely whitish), especially on young shoots and stolons. Plants have a juvenile phase that is morphologically different from the adult phase. The juvenile phase has slender, creeping or root-climbing shoots that are often produced near the base of the plant, and bear small, dentate leaves. The adult phase has substantially thicker stems (up to 20 cm diam. at the base) and have large, thicker leaves with variable margins, these shoots are secured to the host by adventitious roots. 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,



Figure 127. **A.** *Hydrangea peruviana*, flowering branch, note the large peripheral, brown flowers. **B.** Adult plant stem of *H. anomala* with rough bark and numerous adventitious roots. **C.** Stem cross section of *H. anomala*, showing shallow phloem wedges or arcs, and numerous narrow rays. Photos: A by M.-S. Samain; B, C by P. Acevedo.

longer than the 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, apically dehiscent, brownish, urceolate, conical or subglobose, as large 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 colored exudate. *Hydrangea* may be confused with *Schradera* (Rubiaceae) a genus that also has a juvenile phase morphologically different from the adult phase, by the absence of stipules and sometimes by the leaves with serrate, dentate or lobed margins.

Distribution: A genus of ~100 recognized species distributed in the Asiatic tropics, Indo-Malesia, Hawaiian Islands, North America and in 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; primary forests, commonly in cloud and rain forests, often near small streams, but most diverse between 1,000 and 2,000 m elevation, rarely at sea level or above 2,500 m.

PHILADELPHUS Linnaeus, Sp. Pl. 470. 1753.

Erect, spreading shrubs or scrambling vines up to 6 (20) m long; pubescence of simple, long hairs (strigose), axillary buds commonly evident. Leaves opposite, simple, ovate to lanceolate, discolored, with 3- or 5-plinerved venation, abaxially strigose with prominent veins,

margins entire or remotely narrowly dentate, acuminate and apiculate at apex; petioles slender,



Philadelphus mexicanus from Edwards' Botanical Register. (1829-1847).

~ $\frac{1}{4}$ 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 \pm elongated and pubescent. Flowers 4(5)-merous; hypanthium conical, crowned by the ovate acuminate sepals, grayish strigose; petals free, white, twice as long as the sepals; stamens 13–90 (40–50 in *P. myrtoides* Bertol.), ~ $\frac{1}{2}$ 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 shrubs or scrambling vines; leaves opposite, 3- or 5-plinerved with entire or remotely serrate margins; hypanthium and sepals greyish strigose; petals white; stamens numerous.

Distribution: A genus of ~45 species distributed in Central Europe, Temperate Asia, North America, Mexico and Central America. Eight species are distributed in Mexico within the limits of the Neotropics, five of which are reported as sometimes growing as scrambling shrubs or vines, with *Philadelphus myrtoides* extending from southern Mexico to Guatemala; mountains and Cypress groves (Hu 1954); 1,200–1,930 m. This species is also widely cultivated in Central America south to Costa Rica and Panama (Standley & Steyermark, 1946).