

Last revision by the author 22 Jul. 2009.

First published on the Flora Mesoamericana Website, 29 Jul. 2009.

### 173. HYDRANGEACEAE

Family description and key to the genera by M.J.M. Christenhusz.

Robust herbs, shrubs or woody climbers. Leaves opposite, joined by a line across the stem, formed by the sheathing petiole bases; stipules absent; venation pinnate or pseudo-palmate at the base. Flowers 4-merous; sepals free; petals free, often valvate in bud; stamens usually at least twice as many as petals, numerous in some genera; ovary usually more or less inferior. 17 gen. Warm temperate (East Asia, Caucasus, North America), with a few species in the tropics (SE Asia, Malesia, Polynesia, Hawaii, Central and N South America).

*Hydrangea* and its allied genera were previously placed in the Saxifragaceae, but better constitute their own family. Recent molecular studies (Stevens 2001) places the Hydrangeaceae in the Cornales.

Bibliography: Hufford, L., in Kubitzki, K. (ed.), *Fam. Gen. Vasc. Pl.* 6: 202-215 (2004). Hufford, L., Moody, M.L., Soltis, D.E. *Int. J. Pl. Sci.* 162: 835-846 (2001).

1. Flowers in subglobose or flat (pseudo-)umbellate clusters or plumes; stamens 8 (rarely 10). **1. Hydrangea**

1. Flowers solitary or in lax pauciflorous inflorescences with 1 or 3 flowers at the last node; stamens 24 or more. **2. Philadelphus**

#### **1. Hydrangea** L. N.v.: Hortensia.

*Cornidia* Ruiz & Pav., *Hortensia* Comm. ex Juss.

By M.J.M. Christenhusz.

Woody climbers, lianas, or scandent or erect shrubs. Young twigs glabrous, glabrescent, pubescent or tomentose, the hairs simple, straight or recurved, or stellate. Leaves simple, the margins entire, sinuate, dentate or deeply lobed; venation pinnate;

petioles sheathing at the base. Flowers in terminal, pseudo-umbellate, subglobose or conical plumes or clusters; the inflorescences sometimes subtended by conspicuous bracts in bud. Flowers often unisexual, often sterile flowers present that have a showy enlarged, usually 4-lobed calyx; calyces of fertile flowers often small with 4 (rarely 5) lobes; petals 4, usually small and inconspicuous; stamens 8, the thecae opening by lateral slits; ovaries consisting of 2-3 carpels, the styles free at least for the most part, often recurved and sometimes papillose. Fruit a dry, dehiscent, many-seeded capsule, splitting open at the top. Approx. 20 spp. and many cultivars. Eastern USA, Mexico, Mesoamerica, Andean South America, Southern Chile and Argentina, Himalayas to Japan, Taiwan and the Philippines, Java, Sumatra.

Bibliography: Haworth-Booth, M. *The Hydrangeas* (1950). McClintock, E.A. *Proc. Calif. Acad. Sci.* ser. 4, 29: 147-256 (1957).

1. Plants erect, deciduous shrubs, never scandent; leaves herbaceous; inflorescence a subglobose cluster consisting mainly of sterile flowers with enlarged calyces, the inflorescence not enveloped by broadly ovate involucral bracts; stems glabrous or sparsely pubescent with upward curved hairs. **3. H. macrophylla**

1. Plants scandent, sometimes epiphytic, evergreen shrubs or lianas; leaves coriaceous; inflorescences a flattened pseudo-umbellate or subglobose cluster, enveloped in bud by several broadly ovate involucral bracts, leaving noticeable scars after falling; stems usually with stellate and often also with simple hairs.

2. Young twigs and abaxial leaf blades ferruginous tomentose with stellate hairs; petals white, creamy white or greenish.

3. Inflorescence with sterile flowers along the margin, these with enlarged calyces; leaves broadest at the middle. **1. H. asterolasia**

3. Inflorescence without enlarged sterile flowers; leaves usually broadest above the middle. **5. H. steyermarkii**

2. Young twigs pubescent with simple and stellate hairs, abaxial leaf blades glabrous, glabrescent or sparsely pubescent; petals pink or red.

4. Inflorescences always without enlarged sterile flowers; styles usually 3 (rarely 2 or 4). **2. H. diplostemonia**

4. Inflorescences usually with enlarged sterile flowers; styles always 2.

**4. H. peruviana**

**1. *Hydrangea asterolasia*** Diels, *Notizbl. Bot. Gart. Berlin-Dahlem* 15: 370 (1941). Neotype (designated by McClintock, 1957): Ecuador, *Lugo 49* (S). Illustr.: not found.

Evergreen lianas or shrubs, often epiphytic; young twigs, stems and inflorescences ferruginous-tomentose with stellate hairs. Leaves 3.5-15 × 1-8.5 cm, elliptic and broadest at the middle, coriaceous, the upper surface glabrous, the lower surface tomentose with grey or brown stellate hairs, the base rounded, the margins entire to distantly denticulate, rarely coarsely dentate, the apex rounded to acute; petioles 0.6-1.8 cm. Inflorescence a flattened pseudo-umbellate cluster, enveloped in bud by several broadly ovate involucral bracts, leaving noticeable scars after falling; bracts 1-2.1 × 1-1.8 cm, usually with (cream-)white, sterile flowers along the margin, these with enlarged calyces. Calyx of sterile flowers 0.4-3.9 cm in diameter, irregularly lobed; calyx lobes of fertile flowers 0.2-0.5 mm; petals 1-2.5 × c. 1 mm, white, creamy white or greenish; stamens 3-4 mm, the anthers blue-purple; styles 2. Fruits 1-1.5 × c. 1 mm, ferruginous. *Primary or secondary, wet montane forests*. CR (*Almeda & Nakai 3972*, MO); P (*Hammel & D'Arcy 6395*, MO). (800-)1100-3100 m. (Mesoamerica, Colombia, Ecuador.)

This species is easily recognised by its white petals, its enlarged sterile flowers, and its ferruginous-tomentose indument of the stem and of the lower surfaces of the relatively small leaves.

*Hydrangea jelskii* and *H. tarapotensis* have both been reported for Mesoamerica, but specimens labelled with these names were confused with *H. asterolasia*. These Andean species can be distinguished from the other species described above by having inflorescences that are composed of a series of rounded clusters placed one above the other.

**2. *Hydrangea diplostemona*** (Donn. Sm.) Standl., *J. Wash. Acad. Sci.* 18: 160. (1928). *Gilibertia diplostemona* Donn. Sm., *Bot Gaz.* 61: 373 (1916). Holotype: Costa Rica, *Pittier 14068* (US-1417096!). Illustr.: not found.

*Cornidia umbellata* Ruiz & Pav., *Hydrangea briquetii* Engl., *H. inornata* Standl., *H. preslii* Briq., *H. umbellata* (Ruiz & Pav.) Briq. non Rehder, *Sarcostyles peruviana* Presl.

Woody climbers or scandent, evergreen, sometimes epiphytic shrubs; young twigs, stems and inflorescence pubescent with stellate and sometimes also with some

simple hairs. Leaves (4-)9-25.5 × 2-15, ovate to elliptic, coriaceous, the upper surface glabrous, the lower surface glabrous, glabrescent or sparsely pubescent, the base acute, the margins entire but with minute teeth at broad intervals in the apical part of the leaf, the apex acuminate; petioles 1.5-2.5 cm. Inflorescence a subglobose or pseudo-umbellate cluster, without enlarged sterile flowers, enveloped in bud by several involucre bracts; bracts 1.5-4 × 1-3 cm, broadly ovate, leaving noticeable scars after falling. Calyx-lobes c. 0.5 mm; petals 1.5-2 × c. 1 mm, pink or reddish; stamens 1.5-3 mm, white; styles usually 3, rarely 2 or 4, sometimes coherent in bud. Fruits c. 2 × 2.5 mm. *Primary montane forests, riparian Quercus forests*. CR (Aguilar *et al.* 2710, BM); P (McPherson 9598, MO). 800-1500(-3000) m. (Mesoamerica, Colombia, Venezuela, Ecuador, Peru, Bolivia.)

This variable species can be recognised by the glabrous-glabrescent leaves, the absence of sterile flowers and the red or pink petals. Its only difference with *Hydrangea preslii* is the coherence of the styles in bud (McClintock, 1957), which I find too small a character to recognise this as a separate species.

**3. *Hydrangea macrophylla*** (Thunb.) Ser. in DC., *Prodr.* 4: 15 (1830).

*Viburnum macrophyllum* Thunb. *Fl. Jap.* 125 (1781). Lectotype (designated by Hara, 1955): Japan, *Thunberg s.n. spec. δ*' (S-THUNB-7405!). N.v.: Hortencia (Ch, CR). Illustr.: Haworth-Booth, t. II, *The Hydrangeas* (1950).

*Hortensia opuloides* Lam., *Hydrangea hortensia* Siebold, *H. hortensis* Sm., *H. japonica* Siebold, *H. maritima* Haw.-Booth, *H. opuloides* (Lam.) K. Koch, *H. otaksa* Siebold & Zucc.

Erect, deciduous shrubs to about 3 m; young stems herbaceous, glabrous or sparsely pubescent with upward curved hairs. Leaves 3-15 × 1-8 cm, ovate, herbaceous, the upper surface glabrous, the lower surface glabrous or minutely pilose on the veins, the base acute to cuneate, the margins coarsely serrate to coarsely lobed, the apex acute; petioles 0.8-2.3 cm. Inflorescences without enveloping bracts, without scars at the base, the flowers in a subglobose cluster, consisting mainly of sterile flowers with enlarged calyces. Calyx lobes 0.5-2.3 × 0.3-2.8 cm, incised to the base, appearing almost as separate sepals, blue, white, creamy white or pink, the margins entire or irregularly dentate, in some cultivars the calyces only enlarged in sterile flowers, the fertile flowers with strongly reduced calyces less than 1 mm; petals, 1-3 × 0.5-1 mm, blue; stamens to 1-2 mm, the thecae blue; styles 3. Fruits 3-4 mm.

Roadsides, mountain pastures, secondary forests, often planted and long persistent. T (Cowan, 1983: 45); Ch (*Matuda 16850*, MEXU); G (Standley y Steyermark, 1946: 417); H (*Pineda 146*, MO); N (*Rueda & Coronado 7091*, MO); CR (*Döbbeler 2125*, BM); P (*Hammel et al. 6887*, MO). 1000-2800 m. (Native to the Eastern Himalayas, southern China, Japan; cultivated and naturalized elsewhere.)

Four subspecies are known to occur in East Asia and all of these can be found in cultivation. The Chinese and Japanese have cultivated hortensias since ancient times, resulting in a large diversity of garden varieties with extra large or smaller inflorescences, completely or partly sterile flowers, dissected leaves and various colours of the calyx. Hortensias easily naturalise by cuttings, and the fertile-flowered varieties may also spread by seed. It is extensively planted along roadsides in some areas, and it is certain that more than one variety occurs in Mesoamerica. Although no herbarium specimens have been seen, it is almost certainly also cultivated at higher elevations in Belize and El Salvador.

**4. *Hydrangea peruviana*** Moric. in DC., *Prodr.* 4: 14 (1830). Holotype: Ecuador, *Pavón s.n.* (G-DC). Illustr.: Hufford, *Fl. Pl. Neotropics* 189, t. 95 (2004).

*Cornidia peruviana* (Moric.) Small, *Cornidia radiata* Oerst., *Hydrangea oerstedii* Briq., *H. panamensis* Standl., *H. peruviana* Moric. var. *oerstedii* (Briq.) Freire-Fierro.

Evergreen lianas or shrubs, sometimes epiphytic; young twigs, stems and inflorescences pubescent with simple and stellate hairs. Leaves (4.5-)10-30 × (1.5-)5-11 cm, elliptic and usually broadest at the middle, coriaceous, the upper surface glabrous, the lower surface glabrous, glabrescent or sparsely pubescent, the base rounded to acute, the margins nearly entire to remotely denticulate or occasionally irregularly dentate, the apex acute to acuminate, sometimes rounded; petioles 0.7-3.5 cm. Inflorescence a flattened pseudo-umbellate cluster, usually with pink sterile flowers along the margin, these with enlarged calyces, enveloped in bud by several broadly ovate involucral bracts, leaving noticeable scars after falling; bracts 1.5-3.5 × 1.5-2 cm, Calyx of sterile flowers 0.6-4 cm in diameter, usually regularly 4-parted, pink or whitish; calyx of fertile flowers 0.4-0.5 mm; petals 1-2 × c. 1 mm, pink; stamens 0.4-4.5 mm, blue-purple; styles 2. Fruits 2-3 × 1-2.5 mm. *Submontane rainforests and cloud forests, rarely at lower elevations.* CR (*Davidse 24300*, MO); P

(*Monro & Alfaro 4315*, BM). (100-)500-2400(-3000) m. (Mesoamerica, Colombia, Ecuador, Peru.)

*Hydrangea oerstedii* differs only from *H. peruviana* in the length of the stamens. I did not find this character to be consistently different and therefore do not recognise these as two different species here. *Hydrangea peruviana* can be distinguished by the glabrous-glabrescent leaves, the presence of showy sterile pink flowers and its 2 stamens.

**5. *Hydrangea steyermarkii*** Standl., *Publ. Field Mus. Nat. Hist., Bot. Ser.* 22: 233 (1940). Holotype: Guatemala, *Steyermark 36044* (F!). Illustr.: not found.

Evergreen lianas or epiphytic, scandent, shrubs, often forming dense mats on tree trunks, sometimes trees to 6 m; young twigs, stems and inflorescence ferruginous-tomentose with stellate hairs. Leaves (2-)3.7-16 × (1-)2-9 cm, variably obovate to oblong or lanceolate, usually broadest above the middle, coriaceous, the upper surface glabrous, the lower surface (young leaves) ferruginous tomentose with stellate hairs, the base acute to cuneate, the margins minutely denticulate, the apex rounded to short acute; petioles 0.4-3.3 cm. Inflorescence a flattened pseudo-umbellate cluster, enveloped in bud by several broadly ovate involucral bracts, leaving noticeable scars after falling; bracts 0.7-2 × 0.6-1.8 cm, without enlarged sterile flowers. Calyx 0.6-2 mm; petals c. 2 × 1 mm, white, creamy white or greenish; stamens 1.5-4 mm; styles 2. Fruits 2-2.5 × 3-5 mm. *Tall montane rainforests, cafetales, cloud forests.* Ch (*Breedlove 53460*, MO); G (*Steyermark 36044*, F); H (*House 1105*, MO); N (*Moreno 20221*, MO); CR (*Bello & Cruz 4286*, MO). 700-3000 m. (Endemic.)

This species can be easily recognised by the ferruginous stems and leaves that are broadest above the middle, the absence of sterile flowers and the white petals.

## **2. *Philadelphus*** L. N.v.: Mosqueta.

By M.J.M. Christenhusz.

Lax shrubs, sometimes scrambling. Leaves pseudo-palmately veined, hairy. Inflorescences terminal, with 1 or 3 flowers at the last node, sometimes the flowers solitary or very rarely in an axillary cyme. Flowers usually with a strong, jasmine-like odor; bracts small, caducous; sepals 4, green; petals 4, large, usually white, sometimes

creamy or yellowish; stamens 24 or more, the thecae basifixed, opening with lateral slits; ovary inferior, the style with 4 elongated stigmas. Fruit a dry, many-seeded capsule, with persistent sepals; seeds 1-2 mm, ellipsoid. Approx. 60 spp., probably less. North America, Caucasus, NE. Asia.

Bibliography: Hu, S. *J. Arnold Arbor.* 35: 275-333 (1954); 36: 52-109, 325-368 (1955); 37: 15-86 (1956). Rydberg, P.A. *N. Amer. Fl.* 22: 162-175 (1905).

**1. *Philadelphus mexicanus*** Schltld., *Linnaea* 13: 418 (1839). Lectotype (designated by Christenhusz, in review): Mexico, Veracruz, *Schiede s.n., anno 1829* (HAL-098628). N.v.: Yerbabuena (Ch); mosqueta (G). Illustr.: Hu, *J. Arnold Arbor.* 35: 290, t. II, f. 11 (1954).

*Philadelphus austromexicanus* S. Hu, *P. matudae* Lundell, *P. myrtoides* Bertol., *P. trichopetalus* Körn.

Pubescent, erect or scrambling shrubs or woody climbers; young twigs hairy. Leaves 1.9-8 × 0.3-4 cm; blade ovate to elliptic, the lower surface pubescent and light-green, the upper surface darker green and hairy, 3 to 5-veined basally, the base rounded to cuneate, the margins finely denticulate, the apex acute to acuminate; petioles to 1.2 cm, densely hairy. Flowers solitary in the leaf axils at the end of leafy branches, with pleasant delicate odor; pedicels tomentose; sepals 4, 0.6-1.1 × 0.3-0.6 cm, deltoid-ovate, green, densely tomentose; petals 1.1-2(-2.7) × 0.9-1.5(-2.6) cm, rounded to broadly obovate, white, turning yellowish upon bruising, sparsely pubescent; stamens 24 to numerous, 3-11 mm; ovary inferior, tomentose, the style 3-4 mm, pubescent, the stigmas c. 2 mm, elongate. Capsules ellipsoid or ovoid, with median persistent sepals. *Subtropical montane forests, evergreen cloud forests, riparian woodlands; also cultivated and commonly naturalising.* Ch (*Ghiesbreght 813*, BM); G (*Fraser s.n. anno 1861*, BM); H (*Montoya 110*, MO); ES (*Calderón 687*, MO); CR (*Croat 536*, MO); P (*Woodson & Schery 588*, MO). (1100-)1400-3100 m. (Mexico, Mesoamerica.)

Traditionally *P. mexicanus* and *P. myrtoides* were kept separate on the basis of differences in the hairiness of their petals; however, I found specimens having irregularly pilose and glabrous petals, sometimes on the same plant, which indicates to me that these are one and the same species.

A record of a yellow flowering *Philadelphus* from Guatemala has been reported, but I have not seen any specimens that verify this.

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Index of plant names

- Cornidia peruviana* 1.4
- Cornidia radiata* 1.4
- Cornidia umbellata* 1.2
- Gilibertia diplostemona* 1.2
- Hortensia opuloides* 1.3
- Hydrangea asterolasia* 1.1
- Hydrangea briquetii* 1.2
- Hydrangea diplostemona* 1.2

- Hydrangea epiphytica* 1.1  
*Hydrangea hortensia* 1.3  
*Hydrangea hortensis* 1.3  
*Hydrangea inornata* 1.2  
*Hydrangea japonica* 1.3  
*Hydrangea macrophylla* 1.3  
*Hydrangea maritima* 1.3  
*Hydrangea oerstedii* 1.4  
*Hydrangea opuloides* 1.3  
*Hydrangea otaksa* 1.3  
*Hydrangea panamensis* 1.4  
*Hydrangea peruviana* 1.4  
*Hydrangea peruviana* var. *oerstedii* 1.4  
*Hydrangea preslii* 1.2  
*Hydrangea steyermarkii* 1.5  
*Hydrangea umbellata* 1.2  
*Philadelphus austromexicanus* 2.1  
*Philadelphus matudae* 2.1  
*Philadelphus mexicanus* 2.1  
*Philadelphus myrtoides* 2.1  
*Philadelphus trichopetalus* 2.1  
*Sarcostyles peruviana* 1.2  
*Viburnum macrophyllum* 1.3