

HYDROPHYLLACEAE¹ (C. A. Backer, Heemstede)

1. HYDROLEA

LINNÉ, Sp. Pl. ed. 2 (1763) 328, *nom. cons.*—*Nama* LINNÉ, Sp. Pl. ed. 1 (1753) 226, *non* L. 1759.—*Beloanthera* HASSK. Flora (Bot. Zeit.) 1842, Beibl. 2, p. 53.

Annual or perennial, unarmed or spinous, bitter herbs or undershrubs, often glandular-hairy. Stem terete, farctate, with a peripheral whorl of air-vessels. *Leaves* spread, simple, entire, exstipulate. *Flowers* ♂, actinomorphic, solitary, opposite or between the leaves, or by stunting of the leaves, more or less arranged in a racemiform or paniculiform inflorescence, distinctly pedicelled, lilac blue. Calyx persistent, 5-partite to near the base, segments lanceolate, imbricate in bud, after anthesis not or hardly accrescent. Corolla gamopetalous, deeply 5-partite; limb rotate; segments imbricate in bud, oval, obtuse. Stamens 5, free, inserted in the throat of the corolla, alternating with the segments; filaments filiform from a broadened base, glabrous or papillate; anthers 2-celled, bifid at the base and apex, opening lengthwise. Disk absent. Ovary superior, 2- (rarely 3-, very rarely more-) celled; placentas adnate to the dissepiment, spongy, entire or in cross-section bifid; styles 2 (rarely 3 or more), free; stigmas capitate-clavate. Ovules ∞. *Capsule* globose or ellipsoid, loculicid, or both loculicid and septicid, 2 (rarely more)-valved, or bursting irregularly. Seeds ∞, very small, longitudinally ribbed; endosperm small, straight.

Distr. Species ± 20, in the tropics of both hemispheres; in *Malaysia* 2, of which one indigenous, the other introduced and naturalized in Java.

Ecol. Inhabitants of permanently or intermittently humid or swampy localities at low altitudes, often gregarious. Stem-bases often swollen by spongy aerenchyma.

KEY TO THE SPECIES

1. Placentas in cross-section entire. Corolla from the base of the tube up to the tips of the segments 4½–7 mm long. Styles 1½–2 mm. Stem unarmed, glabrous or only at the top glandular hairy

1. *H. zeylanica*

1. Placentas in cross-section 2-partite. Corolla from the base of the tube up to the tips of the segments 10–12 mm long. Styles 6–8 mm. Stem in the Javan specimens spinous and down to far beneath the top clothed with patent, rather long, gland-tipped very viscid hairs 2. *H. spinosa*

1. *Hydrolea zeylanica* (LINNÉ) VAHL, Symb. Bot. 2 (1791) 46; CHOISY, Mém. Soc. Phys. Genève 6 (1833) 107; WIGHT, Ic. Pl. Or. 2 (1843) t. 601; BLANCO, Fl. Fil. ed. 2 (1845) 148; ed. 3, 1 (1877) 266; CHOISY in DC. Prod. 10 (1846) 180; MIQ. Fl. Ind. Bat. 2 (1857) 633; DALZ. & CLARKE in HOOK. f. Fl. Br. Ind. 4 (1883) 133; MERR. Fl. Man. (1912) 392; KOORD. Exk. Fl. 3 (1912) 125; BRAND, Pl. R. 59 (1913) 174; MERR. Sp. Blanc. (1918) 326; EN. Born. Pl. (1921) 510; EN. Philip. 3 (1923) 372; RIDL. Fl. Mal. Pen. 2 (1923) 438; BACK. Onkr. Suiker. (1931) 533; OCHSE & BAKH. v. D. BR. Veg. (1931) 349, f. 220; BURK. Dict. 1 (1935) 226; STEEN. Bull. Bot. Gard. Buit. III, 17 (1948) 460; BACK. Bekn. Fl. Java, em. ed. 8 (1949) fam. 188, p. 3; HENDERSON, Mal. Wild. Fl. 2 (1950) 308, fig. 291.—*Nama zeylanica* LINNÉ, Sp. Pl. (1753) 226; BURM. f. Fl. Ind. (1768) 73; O.K. Rev. Gen. 2 (1891) 435.—

Steris javanica LINNÉ, Mant. 1 (1767) 54, 2 (1771) 264.—*Steris aquatica* BURM. f. Fl. Ind. (1768) 73, t. 39, f. 3.—*Hydrolea inermis* LOUR. Fl. Coch. 1 (1790) 172; CHOISY, Mém. Soc. Phys. Genève 6 (1833) 108; DC. Prod. 10 (1846) 180; BACK. Ann. J.B.B. Suppl. 3 (1909) 404.—*Hydrolea javanica* Bl. Bijdr. (1826) 725.—*Hydrolea arayatensis* BLANCO, Fl. Fil. (1837) 211.—*Nama jamaicensis* BLANCO, Fl. Fil. (1837) 211; ed. 2 (1845) 148; ed. 3, 1 (1877) 266, *non* L.—*Beloanthera oppositifolia* HASSK. Flora (Bot. Zeit.) 1842, Beibl. 2, 53; MIQ. Fl. Ind. Bat. 1, 1 (1858) 1065.—Fig. 1.

Perennial, 0.10–1.50 m long, often much branched. Stem in the lower part creeping and freely rooting, emitting many erect branches, in the higher part erect. *Leaves* variable as to shape and size, usually narrowly lanceolate, less often oblong or elliptic, from an acute or (broader leaves) slightly

(1) Rather small family consisting of ca 18 genera and ca 230 spp., mostly American, few in Africa, Asia, and the Sandwich Islands.

Besides *Hydrolea* a few American spp. of the genera *Nemophila* and *Wigandia* are sometimes cultivated as ornamentals in Malaysia. Cf. WIGMAN, Teysm. 32 (1921) 49.



Fig. 1. *Hydrolea zeylanica* (L.) VAHL, flowering branch, nat. size, a. bud, b. flower in anthesis, c. ovary, d. ovary in section (details enlarged; after WIGHT).

obtuse base, acute, quite glabrous or along the margins shortly and indistinctly ciliolate, 1½–12 cm by ¾–2½ cm; primary nerves 4–11 pairs. Petiole 2–5 mm, glabrous or, in young leaves, glandular hairy. *Flowers* either solitary opposite or between the leaves or arranged in shorter or longer lax or rather dense racemes or panicles, which are often combined into a leafy paniculiform inflorescence; pedicels patently glandular hairy or glabrous, 2–10 mm. Calyx usually clothed on the outside with patent, gland-tipped hairs, rarely glabrous, during anthesis 5–7 mm long, afterwards slightly accrescent; segments narrowed towards the tip. Corolla tube white, segments lilac blue with a white base, at last widely patent, oval, obtuse, 2½–4 mm wide. Filaments 2½–4 mm long, white or lilac, glabrous, their broadened base white as are the anthers. Apex of ovary finely pubescent. Styles 2, widely divergent, thinly pilose, lilac blue; stigmas white. *Capsule* ellipsoid, 4–5 mm long, thinly pilose, bursting irregularly. Seeds oblong, ½–⅔ mm long.

Distr. Ceylon, Hindustan, Further India; also reported for Queensland (not seen from there), in *Malaysia*: only in the western half: Simalur, Sumatra, Malay Peninsula, SE. Borneo, Java, SW. Celebes, Philippines.

Ecol. From the plains up to ± 1000 m, in permanently or periodically swampy or inundated localities, very often in paddy-fields, also in shallow pools and on river-banks, locally often so numerous that the flowers tinge the whole field blue. *Fl.* Jan.–Dec. in favourable localities.

Uses. Young leafy tops of the stems are eaten. In India the foliage is used as a poultice for ulcers.

Vern. Several names, all of them unreliable as they are also applied to other more or less similar plants: *gagabusan*, *sëmbung*, *djukut saät*, *S.*, *gunda*, *J*, *S*, *balihin fonau* (Simalur).

Note. Most of the Malaysian specimens have a glandular calyx. In Borneo and Central Java specimens with a glabrous calyx (var. *glabra* BRAND) have been collected.

2. *Hydrolea spinosa* LINNÉ, *Sp. Pl. ed. 2* (1763) 328; GAERTN. *Fruct. 1* (1788) 263, t. 55, f. 9; H.B.K. *Nov. Gen. 3* (1818) 98; *Bot. Reg. 7* (1821) t. 566; CHOISY, *Mém. Soc. Phys. Genève 6* (1833) 110; in DC. *Prod. 10* (1846) 181; BENN. in MART. *Fl. Bras. 7* (1871) 394, t. 129; BACK. *Ann. J.B.B. Suppl. 3* (1909) 404; KOORD. *Exk. Fl. 3* (1912) 125;

BRAND, *Pfl. R. 59* (1913) 180, f. 39; KAINRADL, *Sitz. Ber. Akad. Wiss. Wien, M.-N. Kl. Abt. I*, 136 (1927) 167–193; BACK. *Onkr. Suiker. (1930) 533*; *Bekn. Fl. Java, em. ed. 8* (1949) fam 188, p. 3.

var. spinosa.—*var. euspinosa* BRAND, *l.c.* 181.

Perennial, 0.60–1.30 m long, often much branched. Stems rather robust, erect or usually in the lower part creeping, copiously rooting and sending up many erect strong branches; thorns (metamorphosed branches) axillary, patently glandular hairy with a very sharp glabrous apex, often bearing small leaves, at last ½–6 cm long; the larger ones not rarely ramified. *Leaves* oblong or lanceolate from an acute base, often slightly undulate, on both surfaces and along the margin thinly glandular pubescent, 1–12 cm by ¼–3 cm; primary nerves 10–20 pairs. Petiole rather densely glandular pubescent, 2–15 mm. *Flowers* arranged in dense small-leaved racemes or panicles which are combined into a leafy, often dense and rather large paniculiform inflorescence. Pedicels patently glandular hairy, 1½–8 mm. Calyx outside densely clothed with long gland-tipped hairs, during anthesis 7–9 mm long, afterwards not or hardly accrescent; segments acute. Corolla tube white at the base, segments a fine lilac blue, at last widely patent, oval, obtuse, 5–8 mm wide. Filaments 8–10 mm, glabrous; their widened base papillate. Ovary on the top clothed with short glandular hairs, otherwise glabrous. Styles 2 or sometimes 3, very rarely more, divergent, violet, glandular-pubescent. *Capsule* broadly ellipsoid, with a glandular pubescent apex, 6–7 mm high, mostly 2-valved. Seeds oblong, longitudinally ribbed, brown, ½–⅔ mm long.

Distr. Native of tropical America, already long ago introduced into *Malaysia*: yet only locally naturalized in the N. part of W. Java.

Ecol. Sunny or slightly shaded permanently or periodically humid or swampy localities; pools, irrigation ditches, fallow paddy-fields, usually gregarious, locally often very numerous, 1–250 m. *Fl.* Jan.–Dec.

Note. Entire plant intensely bitter.

Excluded

Ellisiophyllum MAXIM. has sometimes been regarded as hydrophyllaceous, but will in this Flora, and in agreement with many recent authors, be treated in the *Scrophulariaceae*. *Cf.* also BRAND, *Pfl. R. 59* (1913) 185.