

NYSSACEAE¹ (J. Wasscher, Groningen)

1. NYSSA

LINNÉ, Sp. Pl. (1753) 1058; Gen. Pl. ed. 5 (1754) 478; WASSCHER, Blumea 1 (1935) 343.—*Agathisanthes* & *Ceratostachys* Bl. Bijdr. (1825) 644; MIQ. Fl. Ind. Bat. 1, 1 (1856) 838.—*Agathidanthus* HASSK. Cat. Hort. Bog. (1844) 254.—*Daphniphylopsis* KURZ, J. As. Soc. Beng. 44, II (1875) 201.

Dioecious trees or shrubs. *Leaves* simple, scattered. Stipules 0. *Flowers* unisexual, often in heads, in the axils of a bract and with 2 bracteoles. ♂: in axillary heads or short racemes; calyx entire or 5-toothed; petals 5, imbricate, often small, alternate with the calyx; stamens 8–16 in 2 alternating whorls; anthers small, dorsifixed with lateral lengthwise slits; disk pulvinate; style rudimentary. ♀: solitary, axillary or in 2–10-flowered heads; ovary inferior, 1-locular, connate with the 5-toothed or entire calyx; petals 5–8 often minute; stamens of inner whorl partly sterile, both petals and anthers soon dropping; style with 2 appressed later divergent often torulose branches stigmatose on their inside, brittle, often deficient in the herbarium. Ovule 1, hanging from the apex of the cell, anatropous with 2 integuments. *Fruit* drupaceous ovoid to oblong.

Distr. *Ca* 6 spp., 4 in Atlantic N. America, 1 in China, 1 from India to W. Malaysia.

Ecol. The American spp. mostly in swamp forests, the Asiatic one not so.

Notes. The flowers are often deficient in the herbaria. The polymorphy of *N. javanica* suggests that perhaps more than one species is present in Malaysia.

1. *Nyssa javanica* (BL.) WANG. Pfl. R. 41 (1909) 15; WASSCHER, Blumea 1 (1935) 344.—*Ceratostachys arborea* BL. Bijdr. (1825) 644; MIQ. Fl. Ind. Bat. 1, 1 (1856) 839.—*Agathisanthes javanica* BL. Bijdr. (1825) 645; MIQ. Fl. Ind. Bat. 1, 1 (1856) 839.—*Agathidanthus javanica* HASSK. Cat. Hort. Bog. (1844) 254.—*Nyssa sessiliflora* HOOK. f. & Th. Gen. Pl. 1 (1867) 952.—*Ilex daphniphyloides* KURZ, J. As. Soc. Beng. 39, II (1870) 72.—*Daphniphylopsis capitata* KURZ, l.c. 44, II (1875) 201; For. Fl. Burm. 1 (1877) 240.—*Nyssa arborea* KOORD. Exk. Fl. Jav. 2 (1912) 731.—*Nyssa bifida* CRAIB, Kew Bull. (1913) 69.—Fig. 1.

Dioecious tree up to 40 m, 30–100 cm diam., clear bole 13–23 m, buttresses mostly absent. Twigs tomentose, glabrescent. *Leaves* rather densely set, oblong-lanceolate to obovate, rarely sub-ovate, base acute, apex abruptly acuminate, coriaceous, entire, sparsely hairy to tomentose on midrib and nerves beneath, further glabrous, 5–23 by 2½–8 cm; in seedlings the 1st pair of leaves is opposite; nerves 8–11 pairs; petiole 1–3½ cm long, flat or slightly sulcate, hairy or glabrous. *Flowers* pallid, in pedunculate nearly globose axillary heads 12–18 mm diameter; peduncles flattened towards the apex ¾–5 cm long, their apex 2–5 mm broad, glabrous or hairy, *ca* halfway with 1–2 sessile small acute bracts 3–4 by 1 mm. Receptacle globose to ellipsoid, flattened, 2–3 and 4–5 mm. Flowers enveloped by 1 bract and 2 half-way connate bracteoles, all broad-ovate, sericeous-ciliate, 2–2½ by 1½–3 mm, in ♀ persistent.—♂:

Flowers 20–40 capitate, ½–4 mm pedicellate; calyx teeth 4–5 rounded, ½–¾ by 1–1½ mm, outside appressed-hairy, ciliate; petals 4–5 free, ovate with broad base, curled back, 3–5 by 1½–3 mm, both sides very short spreading hairy; stamens 8–10, those of outer whorl 3–5 of inner 2–4 mm long; anthers elliptic 1½ by 1 mm, outer loculi often larger than inner ones; disk ½–1 by 1–2 mm, 8–10 lobed.—♀: Flowers usually 3–8 rarely up to 18, sessile; calyx campanulate 2–3 by 1½ mm, densely appressed-sericeous; lobes 4–5 irregular, rounded, ½–1 by 2½ mm or almost absent; petals 4–5 as in ♂ but smaller 3–4 by 2½–3 mm; stamens 8–10, probably of inner whorl at least sterile, smaller than in ♂; style 1½–2 by ½–1 mm, with 2 divergent (in bud one branch longer and incurved over the other), or curled branches 1–2 mm long. *Fruit* ellipsoidal, little flattened, 1½–2¼ by 4–1½ cm, ¾–1½ cm thick, crowned by the disk & calyx limb 1 by 2 mm, immature yellow, ripe purple. Exocarp coriaceous glabrescent, mesocarp spongy-fleshy. Stone flattened obovate, acute 1–2 by ½–1¼ cm, 2–6 mm thick, on one side with 5 length-grooves, the other side with few tubercles above the middle and a length-keel.

Distr. SE. Asia and *Malaysia*: Sumatra, Mal. Peninsula, Borneo, Java, 600–1600 m alt. (in Siam and Sumatra once at 100 m, in the Himalaya ascending to 2400 m acc. to HOOK. f.).

Ecol. Common or scarce, never gregarious, in mixed evergreen mountain forests both in ever-wet and periodically dry regions (E. Java), not in sec-

(1) The family consists of 3 genera, 2 of which are endemic in Central Asia. *Nyssa* occurs from Malaysia to Asia and N. America. Formerly the family was included in the *Cornaceae sens. ampl.*



Fig. 1. *Nyssa javanica* (BL.) WANG. Twig, $\times \frac{2}{3}$, a. male flower, $\times 6$, b-d. female flowers, $\times 6$, e. galled fruits, $\times \frac{2}{3}$, f. fruit, $\times \frac{2}{3}$, g. seed, $\times \frac{2}{3}$.

ondary forest, mostly *fl.* Jan.-May, *fr.* July-Dec. The thick end-bud produces young pale brown-red foliage and flowers in the rainy season. Fruits often deformed into worm-shaped galls.

Vern. Malay names in Sumatra mostly 'me-dang' with some additional name (also common for *Laur.*), in Java *hiroeng*, or *kiroeng*, Sd; Javanese names very variable.

Uses: Rather heavy dense wood not highly estimated. Bark grey, smooth, dingy yellow in section. Fruits are said to be edible and have a sweet odour, but a bitter acid taste.

Notes. The fruits are often deformed to a gall on which BLUME based his *Ceratostachys arborea*. The variability in the flowering parts, their early dropping, and the brittleness of the flowers in the herbarium have caused many discrepancies in literature.

Excluded

Nyssa hollrungii K. SCH. Nachtr. Fl. D. Schutzgeb Süds. (1905) 334 = *Alangium javanicum* (Bl.) WANG. var. *papuanum* (MANSF. & MELCH.) BLOEMB. Blumea 1 (1935) 284.