

### 3. NYSSA Linnaeus, Sp. Pl. 2: 1058. 1753.

#### 蓝果树属 lan guo shu shu

Trees dioecious. Leaves often crowded near ends of branches, estipulate. Flowers unisexual, usually in heads or short racemes, in axil of a bract with 2 bracteoles. Male flowers 5-merous. Stamens 10, arranged in two alternate whorls; filaments linear; anthers 2-celled, dorsifixed, with lateral lengthwise slits; disk pulvinate. Female flowers (4 or)5-merous; staminodes usually present. Ovary inferior, 1(or 2)-loculed, 1-ovuled; style bifid, with stigmatic tissue at inside of stylar arms. Fruit drupaceous, ± laterally flattened, with persistent calyx and disk.  $n = 22$  [in *Nyssa javanica* (Blume) Wangerin (Mehra & Bawainin, Evolution 23: 466–481. 1969)].

About 12 species: four in North America, one in Costa Rica, one from India to Malaysia, and seven (five endemic) in China.

According to C. Q. Zhang (pers. comm.), most Chinese species of *Nyssa* are endangered and some of them may already have become extinct.

- 1a. Flowers pedicellate, in umbels or racemes.
  - 2a. Branchlets, petioles, and pedicels pilose when young, subglabrous when old ..... 5. *N. sinensis*
  - 2b. Branchlets, petioles, and pedicels persistently pilose ..... 4. *N. shweliensis*
- 1b. Flowers in heads, sessile or male ones shortly pedicellate.
  - 3a. Leaves thin, papery.
    - 4a. Leaf blade subelliptic, to  $5 \times 3.5$  cm, petiole to 1 cm ..... 2. *N. leptophylla*
    - 4b. Leaf blade suboblong, not less than  $8 \times 4$  cm, petiole not less than 1.5 cm ..... 6. *N. wenshanensis*
  - 3b. Leaves thick, leathery.
    - 5a. Drupes usually less than 1.2 cm; branchlets, pedicels, and leaves glabrous ..... 3. *N. shangszeensis*
    - 5b. Drupes not less than 1.4 cm; branchlets, pedicels, and leaves pilose at least when young.
      - 6a. Branchlets, pedicels, and leaves abaxially tomentose when young, subglabrous when mature ..... 1. *N. javanica*
      - 6b. Branchlets, pedicels, and leaves abaxially persistently pilose ..... 7. *N. yunnanensis*

**1. *Nyssa javanica*** (Blume) Wangerin in Engler, Pflanzenr. 41(IV. 220a): 15. 1910.

华南蓝果树 hua nan lan guo shu

*Agathisanthes javanica* Blume, Bijdr. 645. 1826; *Cerato-stachys arborea* Blume; *Daphniphyllopsis capitata* Kurz; *Ilex daphniphylloides* Kurz; *Nyssa arborea* (Blume) Koorders; *N. bifida* Craib; *N. sessiliflora* J. D. Hooker & Thomson.

Trees deciduous, to 30 m high. Current year twigs densely tomentose, glabrescent. Leaves often crowded near ends of branches; petioles 1.5–3.5 cm, flattened; leaf blade oblanceolate or oblong-obovate,  $10-15(-23) \times 3-5$  cm, leathery, tomentose when young, late glabrescent except at veins abaxially, midvein and secondary veins 8–15 pairs conspicuous adaxially, base slightly cuneate or acute, margin entire, apex acute. Flowers in ± globose axillary heads; peduncle 1–3.5 cm. Calyx campanulate, outside densely hairy; lobes triangular,  $4-5 \times 1-1.5$  mm. Petals 4 or 5, yellowish or greenish, ovate to obovate,  $3-5 \times 1.5-3$  mm, both surfaces tomentose. Male heads 20–40-flowered; pedicels 1–4 mm, slender, pubescent. Stamens 8–10, in 2 series, outer ones ca. 4 mm, inner ones ca. 2 cm. Female heads with 3–8(–15) sessile flowers; peduncle similar to male ones; staminodes 8–10. Styles 1.5–2 mm, 2-lobed at top. Drupe purple, ellipsoid,  $1.4-2.6$  cm,  $1.2-1.5$  mm in diam. Seeds flattened, on one side with 5 lengthwise grooves, other side with few tubercles on upper half. Fl. Apr–May, fr. Oct.

Evergreen forests; 100–2500 m. Guangdong, Guangxi, Hainan, Yunnan [Bhutan, India, Indonesia, Laos, Malaysia, Myanmar, Vietnam].

**2. *Nyssa leptophylla*** W. P. Fang & T. P. Chen, Acta Phytotax. Sin. 13(2): 84. 1975.

薄叶蓝果树 bao ye lan guo shu

Trees small. Bark brown, smooth; young branches pubes-

cent, becoming glabrous. Petiole 7–10 mm, pubescent; leaf blade abaxially light green, adaxially dark green, subelliptic,  $4-5 \times 3-3.5$  cm, thinly papery, glabrous except midvein sparsely pubescent at base, lateral veins 9 or 10 pairs conspicuous abaxially, base broadly cuneate or obtuse, margin entire, revolute when dried, apex acute. Flowers unknown. Drupes sessile, 2 or 3 in head, subovoid or obovate, slightly flattened, 7–8 mm, ca. 5 mm in diam., ca. 3 mm thick, pubescent when young, late glabrescent; peduncle 2.5–2.8 cm, slender. Seeds slightly laterally flattened, with 5–7 lengthwise grooves. Fl. unknown, fr. Sep.

- Sparse forests; ca. 1000 m. Hunan.

*Nyssa leptophylla* is known to us only from the protologue.

**3. *Nyssa shangszeensis*** W. P. Fang & Soong, Acta Phytotax. Sin. 13(2): 84. 1975.

上思蓝果树 shang si lan guo shu

Trees evergreen, small, 3–5 m high; branches thick, ca. 5 mm in diam., current year twigs glabrous. Petiole 1.5–2.5 cm, glabrous; leaf blade abaxially light green, adaxially green, narrowly elliptic, sometimes oblong-obovate,  $7-11 \times 3.8-4.8$  cm, thickly leathery, glabrous, lateral veins 9 or 10 pairs, base broadly cuneate or obtuse, margin slightly sinuate or subentire, revolute when dried, apex acute. Flowers unknown. Drupes sessile, 3 or 4 in head, narrowly ellipsoid, laterally flattened, ca. 1.2 cm, ca. 7 mm in diam., ca. 4 mm thick, outside pubescent, with persistent calyx at top and 3 oval bractlets at base; peduncles 1.5–2.5 cm, thick. Seeds laterally flattened, with 5–7 lengthwise grooves. Fl. unknown, fr. Sep.

- Evergreen forests; ca. 300 m. SW Guangxi (Shangsi).

*Nyssa shangszeensis* is known to us only from the protologue.

4. *Nyssa shweliensis* (W. W. Smith) Airy-Shaw, Kew Bull. 23: 311. 1969.

瑞丽蓝果树 rui li lan guo shu

*Alangium shweliense* W. W. Smith, Notes Roy. Bot. Gard. Edinburgh 13: 152. 1921.

Trees to 15 m high. Young twigs light purple, densely pilose, becoming dark brown and glabrous when old. Petiole 2.5–4 cm, pilose; leaf blade ovate to ovate-oblong, 9–14 × 5.5–8 cm, papery, abaxially densely pilose at veins, adaxially sparsely stiffly hairy, midvein and 7–9 pairs of lateral veins more conspicuous abaxially, base subrounded, margin slightly sinuate, apex acuminate. Staminate flowers in dense racemes or small umbels; peduncle 2.5–3 cm, densely pilose; bract solitary, ovate, ca. 1 cm; disk platform, pilose. Pedicel 7–8 mm, slender, pilose. Calyx lobes 5, ovate or triangular, outside pilose. Petals 5, sublanceolate, ca. 3 × 1 mm. Stamens 10, in 2 series, unequal, 2–4 mm, sparsely pilose at base. Female flowers not seen. Drupe ovoid or oblong, ca. 1.3 cm, 6–7 mm in diam.; calyx lobes and disk persistent; petiole 3–6 mm; exocarp mealy, endocarp woody, 1-seeded. Fl. Apr–May, fr. Sep.

- Sparse forests; 1700–2700 m. W Yunnan [?Vietnam].

*Nyssa shweliensis* is possibly only a small-fruited variant of *N. wenshanensis*.

5. *Nyssa sinensis* Oliver, Hooker's Icon. Pl. 20: t. 1964. 1891.

蓝果树 lan guo shu

*Daphniphyllum cavaleriei* H. Léveillé; *Microrhammus bodinieri* H. Léveillé; *Nyssa sinensis* var. *oblongifolia* W. P. Fang & Soong.

Trees to 20 m tall. Bark dark gray, shallowly fissured, lenticellate. Petiole 1.5–2 cm, flattened; leaf blade abaxially light green, adaxially dark green, oblong to narrowly oblong, 10–15 × 4–6(–8) cm, papery to subleathery, abaxially sparsely pubescent, adaxially glabrous, midvein and 6–10 pairs of lateral veins distinct abaxially, inconspicuous adaxially, base subrounded, margin slightly sinuate, apex acute. Inflorescences umbels or racemes; peduncle 3–5 cm, sparsely pilose when young, glabrescent. Staminate flowers on old branches. Pedicels ca. 5 mm. Calyx lobes small. Petals shortly oblong, shorter than filaments. Stamens 5–10. Female flowers axillary on young branches. Pedicels 1–2 mm. Calyx lobes entire. Petals ca. 1.5 mm. Stamens 8–10. Drupe bluish, oblong or obovoid, 1–1.2 cm, ca. 6 mm in diam., 4–5 mm thick, ± laterally flattened. Seeds slightly flattened, with 5–7 lengthwise grooves. Fl. Apr, fr. Sep. *2n* = 44\*.

Wet mixed forests along streams and valleys; 300–1700 m. S Anhui, S Fujian, Guangdong, Guangxi, Guizhou, Hubei, Hunan, Jiangsu, Jiangxi, SE Sichuan, Yunnan, Zhejiang [Vietnam].

6. *Nyssa wenshanensis* W. P. Fang & Soong, Acta Phytotax. Sin. 13(2): 85. 1975.

文山蓝果树 wen shan lan guo shu

*Nyssa wenshanensis* var. *longipedunculata* W. P. Fang & Soong.

Trees to 20 m tall. Bark dark gray; lenticels light white;

branches glabrous. Petiole 1.5–2 cm, slender, glabrous; leaf blade abaxially light green, adaxially dark green, oblong to narrowly elliptic, 8–10 × 4–5 cm, thinly papery, glabrous, lateral veins 10–12 pairs, base subrounded or obtuse, margin entire, apex acute. Staminate flowers sessile, ca. 30 in head; disk plate-form, shortly pilose; peduncle 0.8–1.2 mm, sparsely tomentose. Calyx lobes 4 or 5, light green, subglobose, ca. 0.5 × 0.8 mm, margin usually revolute. Petals suboblong, ca. 3 × 1.8 mm, margin usually revolute. Stamens 8–10, in 2 series, 1.5–3 mm, glabrous. Female flowers and fruit not seen. Fl. May, fr. unknown.

- Evergreen forests; ca. 1900 m. SE Yunnan.

7. *Nyssa yunnanensis* W. Q. Yin ex H. N. Qin & Phengklai, **sp. nov.**

云南蓝果树 yun nan lan guo shu

Flora of China 13: 301–303. 2007.

Type: China. Yunnan: Jinghong Shi, Puwen, 27 Mar 1957 (fl.), *Yunnan Expedition 9102* (holotype, KUN).

Validating Latin diagnosis: that of “*Nyssa yunnanensis* W. C. [sic] Yin” (C. Y. Wu & J. R. Fan in C. Y. Wu, Fl. Yunnan. 1: 292. 1977).

Trees dioecious, 25–30 m tall, ca. 1 m d.b.h. Bark dark brown, shallowly fissured, lenticels conspicuous. Branches densely yellowish tomentose. Petiole 2–3 cm, thick; leaf blade abaxially gray-green, adaxially dark green, elliptic or obovate, 15–22 × 8–12 cm, thickly leathery, abaxially densely tomentose, midvein and secondary veins 14–18 pairs, more densely tomentose, base obtuse or subrounded, margin entire to slightly sinuate; apex acute. Staminate flowers many, in axillary umbels; peduncle 2–2.5 cm, thick; pedicels ca. 3 mm, tomentose. Calyx lobes ovate-triangular, ca. 0.5 mm. Petals 5, oblong, ca. 2 × 1 mm. Stamens 2–3 mm; filaments linear. Female flowers not seen. Drupes 4 or 5 in head, purplish brown, ellipsoid, ca. 2 cm, ca. 1 mm in diam.; peduncles ca. 2 cm. Seeds slightly flattened, with 7 lengthwise grooves. Fl. Mar, fr. Sep.

- Dense forests in valleys; 500–1100 m. S Yunnan.

When *Nyssa yunnanensis* was originally described by Wu and Fan (loc. cit.), two gatherings were indicated as types, one flowering and one fruiting, with the result that the name was not validly published (see Art. 37.2 of the *Vienna Code*).

*Nyssa yunnanensis* was listed as endangered in China by Xu (in Fu & Jin, China Pl. Red Data Book 1: 477. 1992).

Flora of China 13: 301–303. 2007.