



## *Flacourtia turbinata* (Salicaceae: Flacourtiaceae), a new species from Yunnan, China

HONGJIN DONG<sup>1,2</sup> & HUA PENG<sup>1,\*</sup>

<sup>1</sup>Kunming Institute of Botany, Chinese Academy of Sciences, CN-650201, Kunming, China.

<sup>2</sup>Graduate University of Chinese Academy of Sciences, CN-100049, Beijing, China. Email: donghongjin@mail.kib.ac.cn

\*Author for correspondence. Email: hpeng@mail.kib.ac.cn

### Abstract

A new species of *Flacourtia* from Yingjiang, SW Yunnan, China, bordering with Burma, is described and illustrated. *Flacourtia turbinata* is similar to *F. jangomas* in leaf and flower shape, but can be easily distinguished for its triplinerved leaf venation, extraordinary long sepals, turbinate fruit and pubescent leaves and twigs when young.

### Introduction

The genus *Flacourtia* Comm. ex L'Héritier (1786: 59) is the type of Flacourtiaceae (previously placed in Flacourtiaceae, now Salicaceae) (Leskinen & Alström-Rapaport 1999, Chase 2002, Angiosperm Phylogeny Group 2009, Reveal & Chase 2011). It consists of 15 to 17 species, distributed in tropical Asia and Africa. There are 5 species in China with one endemic, 4 of them extending to Yunnan (Yang & Zmarzty 2007). There were 8 species recorded for British India (Hooker & Thomson 1872), 7 species for British Burma (Kurz 1877), and there are as many as 79 names of *Flacourtia* listed in the PlantList, only 8 of them currently accepted (The Plant List 2010), but no modern systematic study on this genus has been published so far. Based on the coalition of styles and presence or absence of the ridges on the fruit, Chinese *Flacourtia* have been divided into two sections: sect. *Connatistylatae* Fan & Xu (1988: 131) and sect. *Flacourtia*.

In April 2007, some specimens were collected by the authors during an exploration of Yingjiang, SW Yunnan. The flowering specimens of *Flacourtia* aroused our interest. In July 2012, we investigated the same place again, and this time fruiting specimens were obtained. After consulting relevant literature (Hooker & Thomson 1872, Kurz 1877, Lai 1999, Yang & Zmarzty 2007), we concluded that it is a separate species new to science, and should be placed in sect. *Connatistylatae*.

### Taxonomy

*Flacourtia turbinata* H. J. Dong & H. Peng, *sp. nov.* (Figures 1 & 2)

It differs from *F. jangomas* in the triplinerved leaf venation, extraordinary long sepals, turbinate fruits, and leaves and twigs with pubescence when young.

**Type:**—CHINA. Yunnan: Yingjiang county, Tongbiguan village, elevation ca. 1100 m, 7 July 2012 (fr), Peng Hua & Dong Hongjin 2813 (holotype KUN!, isotype KUN!).

Rampant shrub, 1–1.5 m tall, deciduous; branches usually armed with tortuous spines; bark yellow-brown or light brown, young branches green, smooth, sparsely pubescent, and later glabrescent. Petiole 3–6 mm long, pubescent or glabrescent; leaf blade thinly leathery to papery, narrowly ovate, ovate-elliptic, or ovate-oblong,

rarely oblong-lanceolate or obovate-lanceolate, 8–15 × 4–6 cm, acute or rounded at base, margin serrate, long-caudate-acuminate at apex, glabrous abaxially, pubescent abaxially when young, then turning glabrous when fruiting; venation triplinerved, slightly raised on both surfaces, secondary veins conspicuous on both surfaces. Inflorescences axillary, solitary, peduncles 1–2 cm long, puberulous; bracts linear, ca. 1 × 5 mm, outside glabrous or sparsely hairy, inside pubescent, margin entire, ciliate. Flowers appearing with young leaves, white to flavescent, honey-scented. Sepals 8 or 10, coalescent as a tube, dropped together, ca. 1 cm long and 1 cm in diameter, apex obtuse, outside pubescent. Staminate flowers unknown. Pistillate flowers: ovary cone-shaped, 4 × 3 mm; styles 4–6, united into a distinct column, ca. 2 mm long, slightly free at their apices; stigmas 2-lobed, dilated, recurved. Fruit green, turbinate, 2–2.5 cm in diameter, characteristically longitudinally angled especially when dried, style column persistent. Seeds 14–16, spindly.



**FIGURE 1:** *Flacourtia turbinata*. (A) flowers, (B) young fruit, (C) ripe fruit, (D) longitudinal section of the fruit and one seed at the top-right corner, (E) lower side of branch showing the tortuous thorns.

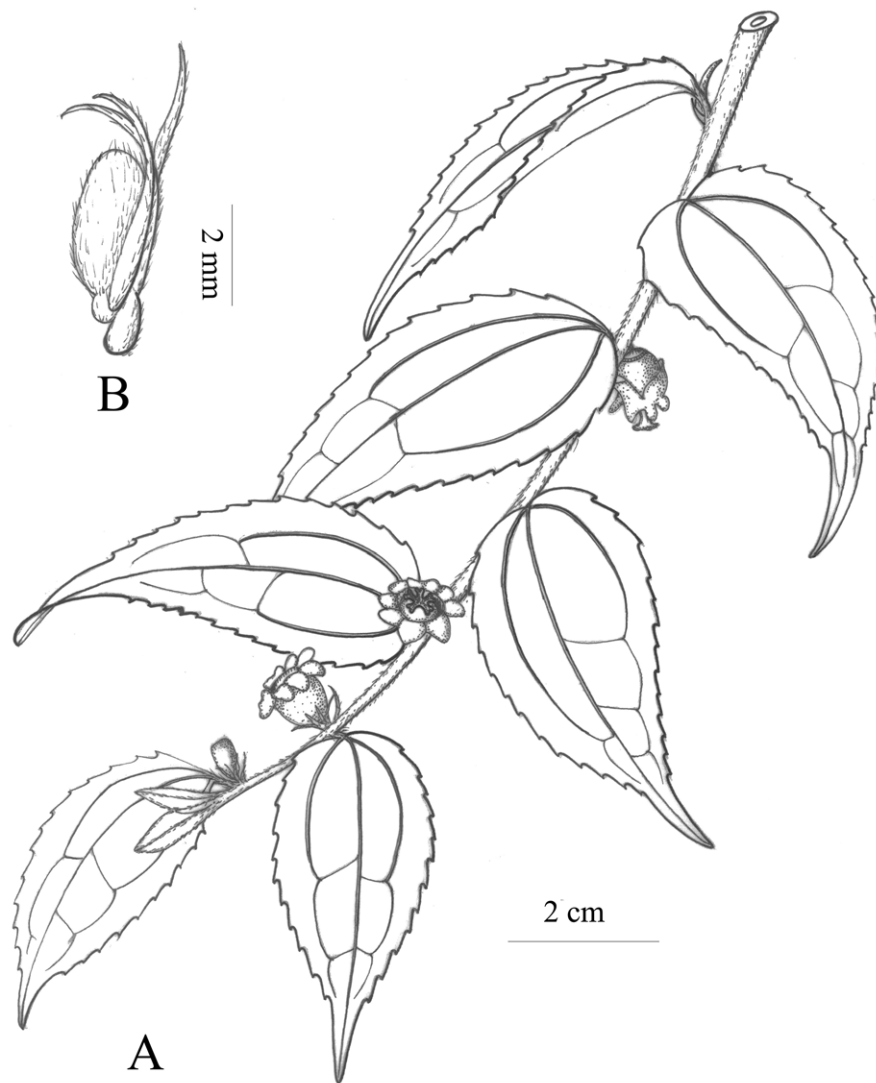
**Distribution:**—Narrowly endemic in China and only known from the type locality, i.e. Tongbiguan village (24°37'N, 97°25'E), ca. 65 km west of Yingjiang county (Figure 3).

**Habitat & Ecology:**—*Flacourtia turbinata* is locally common, growing in the margin of mountain rainforests, accompanied by *Ficus cyrtophylla* (Wall. ex Miq.) Miq., *Lindera nacusua* (D. Don) Merr., *Leea macrophylla* Roxb. ex Hornem., *Gomphostemma arbusculum* C.Y. Wu, *Ageratina adenophora* (Spreng.) R.M. King & H. Rob., etc. Elevation varies from 1100 m to 1300 m, the average annual temperature of Yingjiang County is 19.3 °C, the average annual precipitation is ca. 2600 mm.

**Etymology:**—The species is named for the unusual fruit shape.

**Phenology:**—Flowering from March to May, fruiting from June to August.

**Additional collection (paratype):**—CHINA. Yunnan: Yingjiang county, Tongbiguan village, elevation ca. 1100 m, 18 April 2007 (fl), *Liu Ende* 1897 (KUN!).

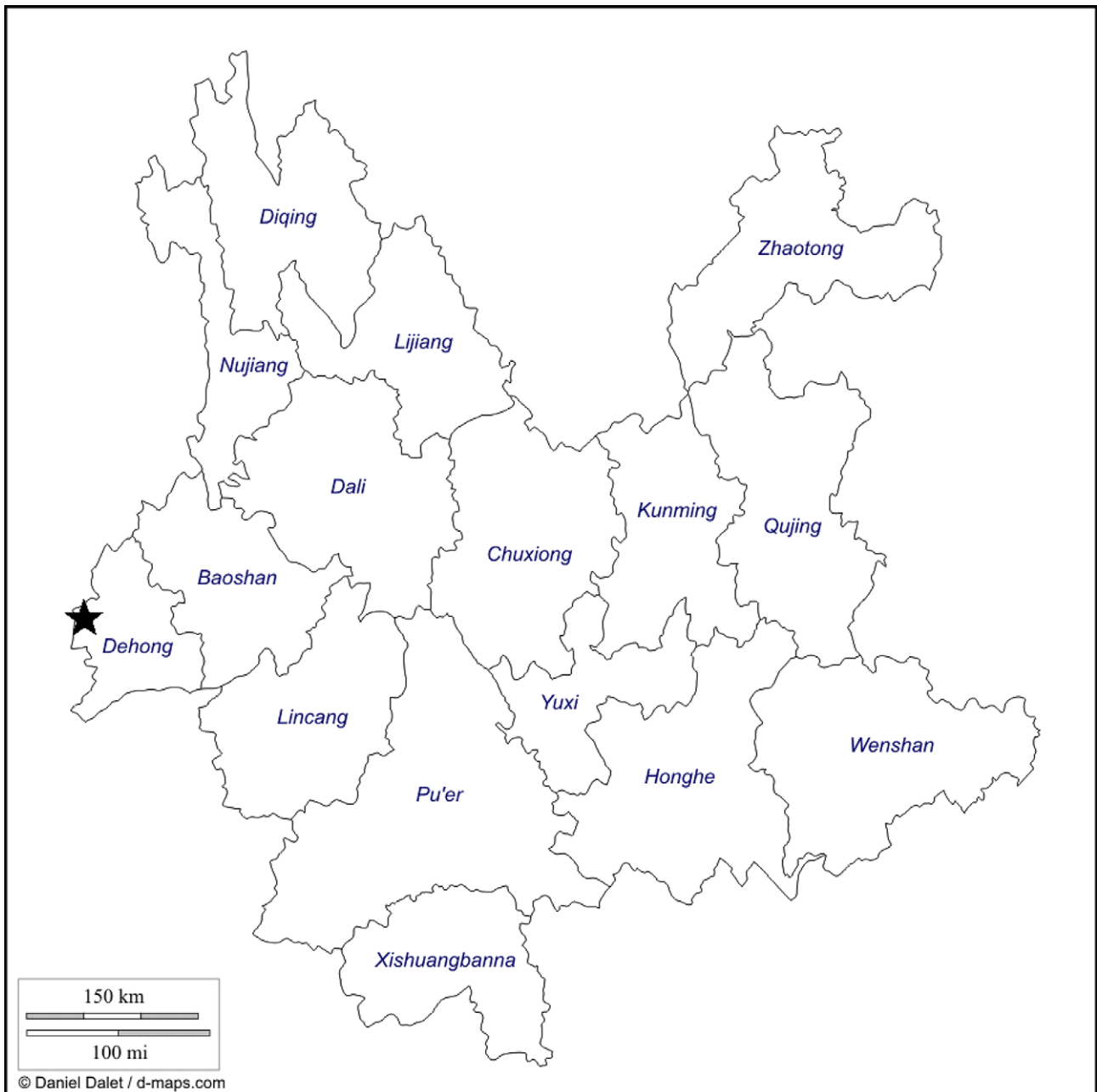


**FIGURE 2:** *Flacourtia turbinata*. (A) Branch with flowers and young fruit, (B) seed. A after Peng Hua *et. al.* 1897, B after Peng Hua & Dong Hongjin 2813.

**Similar species:**—*Flacourtia turbinata* is morphologically close to *F. jangomas* (Loureiro 1790: 634) Raeuschel (1797: 290), distributed in W Guangxi, S Hainan and S Yunnan, based on united stigma and the leaf shape, but it could easily be distinguished by several other characters (Table 1).

**TABLE 1:** Diagnostic character differences between *Flacourtia jangomas* and *F. turbinata*

Characters	<i>F. jangomas</i>	<i>F. turbinata</i>
leaf venation	pinnate	triplinerved
leaf apex	obtuse to narrowly acuminate	long-caudate-acuminate
abaxial leaf surface	glabrous	pubescent especially when young
fusion of sepals	separate	coalescent at base
number of sepals	4–5	8–10
length of sepals	2 mm	10 mm
inflorescence	racemose	simple
shape of fruit	ellipsoidal	turbinate
angles of fruit	recessed	retuse
number of seeds	4–5(–10)	14–16



**FIGURE 3:** Distribution map of *Flacourtia turbinata* in Yunnan.

### Acknowledgements

We thank Prof. Yunfei Deng for his photographs of the plants in nature and for constructive suggestions, and Yin Genshen for the illustration.

### References

- Angiosperm Phylogeny Group (2009) An update of the Angiosperm Phylogeny Group classification for the orders and families of flowering plants: APG III. *Botanical Journal of the Linnean Society* 161: 105–121.
- Chase, M.W. (2002) When in doubt, put it in Flacourtiaceae: a molecular phylogenetic analysis based on plastid *rbcL*

- DNA sequences. *Kew Bulletin* 57: 141–181.
- Fan, G.S. & Xu, Y.C. (1988) The preliminary taxonomic study of *Flacourtia* L'Heritier from China. *Journal of Southwest Forestry College* 02: 131–135.
- Hooker, J.D. & Thomson, T. (1872) Bixineae. In: Hooker, J.D. (ed.) *The Flora of British India* 1. Reeve & Co., London, pp. 189–197.
- Lai, S.K. (1999) Flacourtiaceae. In: Wu, Z.Y. (ed.) *Flora Republicae Popularis Sinicae* 52(1). Science Press, Beijing, pp. 1–80.
- Leskinen, E. & Alström-Rapaport, C. (1999) Molecular phylogeny of Salicaceae and closely related Flacourtiaceae: Evidence from 5.8S, ITS1 and ITS2 of the rDNA. *Plant Systematics and Evolution* 215: 209–227.  
<http://dx.doi.org/10.1007/BF00984656>
- L'Héritier, B.C.L. de (1786) *Stirpes novae aut minus cognitae* 2. Pierres, Paris, 59 pp.
- Loureiro, J. de (1790) *Flora Cochinchinensis* 2. Typis, et expensis academicis, Lisboa, pp. 355–744.
- Kurz, S. (1877) *Forest Flora of British Burma* 1. Office of the Superintendent of Government Printing, Calcutta, 549 pp.
- Raeschel, E.A. (1797) *Nomenclator Botanicus ed. 3*. Feind, Leipzig, 414 pp.
- Reveal, J.L. & Chase, M.W. (2011) APG III: Bibliographical information and synonymy of Magnoliidae. *Phytotaxa* 19: 71–134.
- The Plant List (2010) *The Plant List, a working list of all plants species, Version 1*. Published on the Internet; available from: <http://www.theplantlist.org/> (accessed: 2 April 2013).
- Yang, Q.E. & Zmarzty, S. (2007) Flacourtiaceae. In: Wu, Z.Y. & Raven, P. (eds.) *Flora of China* 13. Science Press, Beijing & Missouri Botanical Garden Press, Saint Louis, pp. 118–121.