



## Taxonomic studies on the genus *Premna* (Lamiaceae) in China—I: the identities of *P. fulva* and *P. tapintzeana*

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### Abstract

With 46 species recognized in the *Flora of China*, *Premna* is now one of the fifth largest genera in the mint family in China. Current classifications have placed *Premna* in the family Lamiaceae removing it from the family Verbenaceae, leaving the identity of many of the Chinese species difficult to resolve. In this study, based on protologues, and consulting both herbarium (including the types) and fresh specimens, *P. crassa* is reduced to synonymy of *P. fulva*; *P. calcicola* (*ined.*), *P. crassa* var. *bijiangensis* (*ined.*), *P. crassa* var. *yuii*, *P. dopii*, *P. puerensis*, *P. shunningensis* (*ined.*), *P. straminicaulis*, *P. yuanjiangensis* (*ined.*) and *P. yunnanensis* (*nom. illeg.*) are recognized as *P. tapintzeana*. *Premna fulva* and *P. tapintzeana* are similar to each other by having small corymbs, subequal stamens enclosed by the corolla tube, and equal or slightly 2-lipped calyces with 5 obtuse lobes, but also different in the shape of leaf blades and upper corolla lips, the indumentum of branchlets, petioles and peduncles, and their habitat. The present investigation provides complete taxonomic treatments, geographic distributions and ecological observations of *P. fulva* and *P. tapintzeana*.

### Introduction

*Premna* Linnaeus (1771: 587) has been transferred from the family Verbenaceae to Lamiaceae (Harley *et al.* 2004, Bramley *et al.* 2010, Olmstead 2010, 2012). The genus is mainly distributed in Old World tropics and subtropics, and comprises *ca.* 50 (Mabberley 2008) to 200 species (Verdcourt 1992) in the world. Though some regional revisions of *Premna* have been done (Munir 1984, Ho 1999, Rajendran & Daniel 2002, Mabberley & de Kok 2004, Leeratiwong *et al.* 2009, de Kok 2013), the complete revision of the genus is missing. So it still ranks among the most taxonomically difficult and complicated genera of Lamiaceae.

*Premna* is considered one of the fifth largest genera with 46 species in the mint family of the flora of China (Chen & Gilbert 1994, Li & Hedge 1994). Among the Chinese species with a lax flat-topped corymb, *P. crassa* var. *yuii* Moldenke (1967: 421), *P. straminicaulis* Wu (1977: 426) and *P. tapintzeana* Dop (1923: 837) were always morphologically compared with *P. crassa* Handel-Mazzetti (1921: 230) (P'ei & Chen 1982, Chen & Gilbert 1994). However, after examination of type specimens it is found that *P. crassa* (Fig. 1A) is identical to *P. fulva* Craib (1911: 442) (Fig. 1B) which is distinct from other *Premna* species by its leaves, which are adaxially reddish brown when dry, and by the covering of dense golden-brown spreading hairs on branchlets, petioles and peduncles. The name “*P. crassa*” used in China is in conflict with the types of that name, and is instead much more consistent with *P. tapintzeana* (Fig. 1C), which is characterized by having mostly conical to rarely spherical corymbs, and by the covering of minutely brownish to purplish pubescences throughout. Most of the specimens identified as *P. crassa* are actually *P. tapintzeana*. Thus, *P. crassa* is reduced to *P. fulva* as synonym.

Furthermore, *Premna crassa* var. *yuii*, *P. straminicaulis* and *P. tapintzeana* are difficult to distinguish clearly. Consulting protologues and herbarium specimens (including the types), and fresh specimens it is determined that *P. crassa* var. *yuii* (Fig. 1D) and *P. straminicaulis* (Fig. 2A) have no significant differences from *P. tapintzeana*, indicating they are conspecific. In addition, *P. puerensis* Qian (1991: 123; Fig. 2B), is also found to be conspecific with *P. tapintzeana*. Several herbarium specimens bearing invalid names, such as *P. calcicola* Wu (*ined.*) (Fig. 2C), *P. crassa* var. *bijiangensis* Yang (*ined.*) (Fig. 2D), *P. shunningensis* P'ei & Chen (*ined.*) (Fig. 2E) and *P. yuanjiangensis* Yang (*ined.*) (Fig. 2F) are all also recognized as *P. tapintzeana*.

**Additional specimens examined:**—CHINA: Guangxi: Donglan County, Ma'anshan Mountain, 30 June 1939, *L.Q. Chen 92171* (IBK sheets no. 00058194, 00058195, 00058197); Jingxi County, Biaoliniao, 29 August 1935, *X.P. Gao 55672* (IBK sheets no. 00058196, 00058199); Lingle County, near Wuzhishan Mountain, 31 May 1959, *Z.T. Li 602998* (PE sheet no. 01276416); Longjing County, Wulian Town, Banbi Village, 1 August 1957, *S.Q. Chen 13256* (IBK sheets no. 00058193, 00058201); Napo County, Baidu Town, Nonghua Village, 16 September 1983, *D. Fang et al. 25246* (GXMI sheet no. 029831); Pingguo County, Chaiguang Town, 2 June 1957, *Y.K. Li P01349* (IBK sheets no. 00058198, 00058195); Tiandong County, Xiangzhou Town, 22 June 1977, *Q. Mu 3-1430* (GXMI sheet no. 042884); Guizhou: An'Shun County, Shuangjiang Town, balai, 12 July 1959, *An'Shun Exp. 292* (KUN sheet no. 198439); Cehen County, north of the city, 16 September 1958, *Z.Y. Cao 717* (KUN sheet no. 198438); No location data, 22 September 1936, *S.W. Deng 91015* (MO sheet no. 04175476); Yunnan: Binchuan County, Waxi to Dayinjie, 15 October 1945, *S.Liu 21613* (PE sheet no. 01276417); Fengqing County, Hila, 22 June 1938, *T.T. Yu 16415* (KUN sheet no. 198436, PE sheets no. 00029785, 00029786); Funing County, Chia-chieh, 21 May 1940, *C.W. Wang 89449* (PE sheet no. 01276419); Funing County, Guichao Town, Jiagai, 17 May 1940, *C.W. Wang 89308* (HITBC sheet no. 046663, KUN sheets no. 198428, 198429, 198432, 198433); Jinping County, Menglaba, Huiyang, 20 April 1956, *Sino-Russia Exp. 129* (KUN sheet no. 198425); Mengla County, Mengyuan Town, in limestone slopes, May 1982, *Yunnan Exp. 32618* (HITBC sheet no. 046486); Tengchong County, Xinhua Town, near Longjiang River, 24 April 1980, *anonymous s.n.* (HITBC sheet no. 080680); Wenshan County, Shii-guu, in mixed forests, 21 August 1947, *G.M. Fen 11398* (KUN sheet no. 198434); Xichou County, Yongxin Town, 16 July 1958, *Y.Y. Hu 580707* (KUN sheet no. 198437); Yanshan County, Ti-mi-ho-shan, 3 October 1939, *C.W. Wang 84176* (KUN sheets no. 198427, 198430, 198431).

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