

Taxonomic notes on the genus *Dumasia* (Fabaceae)

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Abstract

The phylogenetic relationships between species of the genus *Dumasia* have been revealed by previous studies. However, some taxonomic problems still remain to be resolved. In this article, we recognize 10 species of *Dumasia*. We re-circumscribe *D. yunnanensis* Y. T. Wei & S. K. Lee, promote *D. nitida* var. *kurziana* Predeep & M. P. Nayar as a distinct species, and synonymize *D. hunanica* Y. K. Yang, L. H. Liu & J. K. Wu with *D. hirsuta* Craib. *D. prazeri* Predeep & M. P. Nayar is here confirmed as a newly recorded species for China, and *D. zhangjiajieensis* Y. K. Yang, L. H. Liu & J. K. Wu, a distinct species with winged peduncles which was overlooked in previous studies, is also reported here. We provided detailed descriptions, expanded distributions, habitat and phenological information, conservation status, and taxonomic notes for these five species. An updated key to the genus is also provided.

Keywords: conservation status, flora of China, Leguminosae, new combination, new record, new synonym

Introduction

Dumasia DC. (1825: 96) (Fabaceae: Phaseoleae: Glycininae) is widely distributed in tropical and subtropical regions of Africa, Asia, and Papua New Guinea, but most species are concentrated in SW China (Lackey 1981, Pradeep & Nayar 1991). The genus can be easily distinguished from other genera by its tubular calyx with an obliquely truncate mouth (Harvey 1894, Wei 1995) and triangular hexaporate pollen grains (Ferguson & Skvarla 1981). After the genus was established, several regional or global revisions have been done. Pradeep & Nayar (1991) considered that there were ca. 12 species in the genus and provided a key to the taxa distributed in the Indo-Burmese region. Wei (1995) and Sa & Gilbert (2010) revised the genus in China and indicated that there were ca. 10 species worldwide and nine in China. Pan & Zhu (2010) revised the genus comprehensively and recognized eight species, two subspecies, and one variety worldwide. Meeboonya *et al.* (2019) revised the genus in Thailand and recognized two species distributed there. Most recently, Jiang *et al.* (2020) used molecular data to establish the phylogenetic relationships between *Dumasia* species, further deepening understanding of the taxonomy of the genus.

Dumasia yunnanensis Y. T. Wei & S. K. Lee (1985: 159) was described based on four gatherings from northern Yunnan Province and one from Sichuan Province, in which one gathering from Kunming, Yunnan Province (*H. K. Teng* 171, KUN), was designated as the type by the authors. It resembles *D. truncata* Siebold & Zucc. (1845) but can be simply identified by its smaller terminal leaflets (1–5 cm vs. 1.3–10 cm in *D. truncata*), indumentum on leaflets (usually sparsely pubescent vs. glabrous or nearly so in *D. truncata*), and the shape of the terminal leaflet (elliptic to elliptic-ovate vs. ovate or ovate-lanceolate in *D. truncata*) (Wei & Lee 1985, Pan & Zhu 2010). Pradeep & Nayar

(1991) described a new variety of *D. nitida* Chun ex Y. T. Wei & S. K. Lee (1985: 161), viz. *D. nitida* var. *kurziana* Predeep & M. P. Nayar (1991: 275), based on one gathering from Myanmar (designated as the type) and two gatherings from Southern Yunnan (Simao, as “Szemao”) in China (designated as paratypes). The authors indicated that the variety differs from var. *nitida* by its 5–6-ovuled ovary (vs. 1–2 ovules per ovary in *D. nitida*) and 3–6-seeded pods (vs. 1–2 seeds per pod in *D. nitida*). In the revision of *Dumasia*, Pan & Zhu (2010) synonymized *D. nitida* with *D. truncata*. However, the distribution and leaflet characters of *D. nitida* var. *kurziana* do not match *D. truncata* but resemble *D. yunnanensis*, so Pan & Zhu (2010) reduced *D. nitida* var. *kurziana* to *D. yunnanensis*, and confirmed that *D. yunnanensis* is distributed over a wider range, including Nepal, SW China (Sichuan and Yunnan Province), Myanmar, Thailand, India and Bhutan. However, the results of Jiang *et al.* (2020) showed that, although most species recognized by Pan & Zhu (2010) were monophyletic, *D. yunnanensis* was a paraphyletic group comprising two independent lineages. These two lineages have distinct geographical distributions, one north of the range of the other. However, Jiang *et al.* (2020) failed to find morphological differences between the two lineages and deemed them to be cryptic species.

Yang *et al.* (2004) described two new species of *Dumasia*, *D. zhangjiajieensis* Y. K. Yang, L. H. Liu & J. K. Wu (2004: 67) and *D. hunanica* Y. K. Yang, L. H. Liu & J. K. Wu (2004: 68), and provided detailed Latin diagnoses, descriptions, and illustrations for both species. *D. zhangjiajieensis* can be easily distinguished from other *Dumasia* species by its winged peduncles, while *D. hunanica* resembles *D. villosa* DC. in its densely villous petioles and stems, but differs by its bristles on leaf abaxial surfaces, and glabrous calyx and pods. *D. hunanica* also resembles *D. hirsuta* Craib (1914: 116), but bears more flowers on each inflorescence (Liu 2010). However, these two new species were published in an obscure journal and overlooked by most botanists.

Dumasia prazeri Predeep & M. P. Nayar (1990: 109) was described based on one collection from Myanmar. It has the smallest flowers (7–8 mm) in the genus. No more specimens of this species have been collected after it was described, and the current name of the type locality “Chattiah Hill” is difficult to verify in the literature.

In view of the problems described above, further field and herbarium work on *Dumasia* was conducted by authors. This article aims to resolve these remaining problems and also provides additional information on the genus.

Taxonomy

1. *Dumasia hirsuta* Craib (1914: 116).

Type:—CHINA. “W Hupeh: Patung Hsien”, alt. 1000–1300 m, July 1907, *E. H. Wilson* 3483 (lectotype K!; isolectotype BM!). “Hupeh: Patung”, *A. Henry* 6115 (syntypes BM!, K!, NY!, P!). “Chiensi”, *E. H. Wilson* 1330 (syntype K!).

Dumasia hunanica Y. K. Yang, L. H. Liu & J. K. Wu (2004: 68), *syn. nov.*

Type:—CHINA. Hunan: Shimen County: Nanping: “Sangerou”, alt. 300 m, 19th August 1981, *Lin-Han Liu* 17950 (holotype HNNU; isotype CPU).

Description:—Perennial twining herbs 1–3 m. Stems and petioles densely covered with brown base-branched hirsute hairs. Leaves trifoliate; stipules lanceolate, 4–7 mm, striated; petioles 2–13 cm, densely hairy; leaflets ovate to broadly ovate, 1–9 × 1–7 cm, membranous, glabrous adaxially, glabrous or sparsely pubescent abaxially, secondary veins 4–6 pairs, retuse or obtuse at apex, apiculate; terminal leaflets rounded or broadly cuneate at base; lateral ones oblique, truncate at base; stipels small, setaceous; petiolules 2–3 mm, ± covered with brown hairs. Inflorescence an axillary pseudoraceme, 1–10 cm, 2–18-flowered, pubescent to almost glabrous; bracts and bracteoles minute, setaceous. Pedicels 1–3 mm. Flowers ca. 18 mm. Calyx tubular, 5–8 mm, glabrous or sparsely with appressed hairs, obliquely truncate at apex. Corolla yellow to light yellow; standard ca. 17 × 9 mm, with a basal claw ca. 7 mm; wings and keels as long as the standard. Ovary 4–8-ovuled. Pods linear, flat, 4–7 cm, ca. 1 cm wide, glabrous, with raised veins, beaked at apex, attenuate at base. Seeds 4–7, brownish black.

Distribution and habitat:—*Dumasia hirsuta* is mainly distributed in the southern part of China: Chongqing, Fujian (currently known from online photos, <http://ppbc.iplant.cn/tu/4455394>), Guangxi, Guizhou, Hubei, Hunan, Jiangxi, Shaanxi, Sichuan, and Yunnan). It grows in moist valleys, forests, hill slopes, roadsides, or thickets at elevations between 400–2100 m above sea level.

Phenology:—Flowering and fruiting from May to September.

Notes:—Although Yang *et al.* (2004) indicated that *D. hunanica* resembles *D. villosa* and *D. truncata*, key morphological characteristics mentioned by the authors (*i.e.* base branched bristles along stems and petioles, ovate leaflets, sparse hairs on abaxial surface, and glabrous pods) are consistent with the characteristics of *D. hirsuta*, so here we synonymize *D. hunanica* with *D. hirsuta*.

Iconography citation:—Wei (1995: 250): plate 61: 9.

Conservation status:—*Dumasia hirsuta* is widespread in South China and considered as **Least Concern (LC)** according to IUCN Categories (2019).

Specimens examined:—**CHINA. Chongqing:** Fengjie, Zhonghe, Guanyinhe, alt. 1300 m, 1st July 1958, Z. R. Zhang 25437 (IBSC). Fuling, Sanjiang, Honghuagou, in valley, in thickets, alt. 550–600 m, 13th June 1979, *Anonymous* 0429 (SM). Jinfo Mountains, Daheba, Biaoshuiyan, in moist valley, under mixed woods, alt. 800 m, 27th September 2007, M. B. Ren J01 (PE). Nanchuan, J. H. Xiong & Z. L. Zhou 110 (HIB). Nanchuan, Xiaohe, Sanchacun, near the rampart, alt. 1700 m, 20th July 1957, J. H. Xiong 92150 (SZ). Nanchuan, Jinfo Mountains, Meitancao, alt. 2100 m, 12th July 1957, G. F. Li 62666 (KUN, SZ). Nanchuan, Jinfo Mountains, Gaoxuezi, Sanbulouti Valley, hill slope, under secondary forest, roadside, alt. 1570 m, 26th June 1978, *Pl. Geography Exped.* 6 (CDBI). Nanchuan, Delong, Hualin, roadside, alt. 1350 m, 22nd June 1986, *Jinfoshan Exped.* 1333 (PE). Shizhu County, Qiliao, Zhongqiushui, in moist valley, alt. 1150 m, 25th July 1978, Y. Chen 2942 (CDBI). Shizhu County, Shenxin, Qidadui, forest margin, alt. 1400m, 16th June 1979, *Anonymous* 0834 (SM). Shizhu County, Shiliu, under forest, alt. 1300 m, 10th June 1979, *Anonymous* 0726 (SM). Wulong County, Tudi, moist place, alt. 600 m, 11th September 1978, W. H. Wang 3640 (CDBI). **Guangdong:** Lechang County, Jiufeng District, Jiangyuan, Yangdong, in valley, under sparse forest, alt. 600 m, 8th August 1986, B. Y. Chen *et al.* 2755 (IBSC). Yangshan County, Guanpokeng, streamside, 1st August 1936, L. Deng 236 (IBSC). **Guizhou:** Anlong County, Longshan, Mashan, limestone cave, alt. 990 m, 11th June 1960, *Guizhou Exped.* Z. S. Zhang & Y. T. Chang 5090 (PE). Fanjing Mountains, in thickets, alt. 1350 m, 20th July 1959, *N. Guizhou Exped.* 2114 (PE). Fanjing Mountains, Macaohe, Jinzigou, riverside, wet places, alt. 780 m, 12th June 1959, *N. Guizhou Exped.* 1120 (PE). Jiangkou County, Heiwanhe Proving ground, in valley, under dense forest, shady places, alt. 650 m, 19th June 1988, *Wulingshan Pl. Exped.* 1167 (KUN, PE). Jiangkou County, Mount Fanjing, Xiaochahe, under forest, alt. 600 m, 19th June 1988, *Wulingshan Pl. Exped.* 357 (PE). Jiangkou County, Baxi, Gongqiaogou, in valley, alt. 900 m, 11th June 1964, Z. S. Zhang, C. Z. Dang, X. N. Xiao *et al.* 402288 (IBSC, PE). Shiqian County, Qingyang, Maoping, in valley, under forest, alt. 1150 m, 28th July 1988, *Wulingshan Pl. Exped.* 2230 (PE). Songtao County, Maoling Mountain, near the town, on rock, sunny places, in thickets, roadside, 21st July 1959, *N. Guizhou Exped.* 1552 (PE). Yinjiang, Jiangkou, in thickets, alt. 1350 m, 20th July 1959, *N. Guizhou Exped.* 2114 (PE). **Hubei:** Patung Hsien, 26th July 1934, H. C. Chow 959 (PE). **Hunan:** Dongkou, in valley, riverside, under sparse forest, 27th June 1959, P. C. Tam 62899 (IBSC). Dongkou, riverside, alt. 790 m, 2nd August 1986, Z. Y. Yang 381 (IBSC). Sangzhi, Shayuan to Nanmuping, along streams, roadside, alt. 420–520 m, 10th July 1988, *Beijing Team* 003762 (PE). Shimen, Jiangping, Gaoqiaohe, Jinguanmen, alt. 530–730 m, 5th July 1987, *Hupingshan Exped.* 0947 & 0979 (PE). Suining County, Huangsang Nature Reserve, Yuantoushan, alt. 1070 m, 28th June 2013, J. J. Zhou & D. Zhou 13435 (CSFI). Xinning, Lizishan, in valley, under forest, alt. 800 m, 13th July, Y. B. Luo 2668 (PE). Xinning, Shun'er, Tongzichong, in valley, alt. 1200 m, 29th June, Y. B. Luo 2493 (PE). Without exact locality, X. G. Li (*Shaoyang Team*) 62899 (IBK). **Jiangxi:** Lushan, Wulaofeng, 14th October 2011, Y. S. Peng, Z. M. Gui, T. J. Liang *et al.* 0367 (ZMNH). **Shaanxi:** Langao County, Taohe, Yiping, alt. 1750 m, 20th July 1959, P. Y. Li 7621 (WUK). **Sichuan:** Xuyong County, Shuiwei, Huagaoxi, alt. 635 m, 4th June 2013, X. F. Gao, Y. D. Gao & W. B. Ju HGX11405 (CDBI).

2. *Dumasia prazeri* Predeep & M. P. Nayar (1990: 109). Fig. 1

Type:—MYANMAR. West slope of Chattiah Hill, 12th December 1900, J. C. Prazer 36 (holotype CAL!; isotypes CAL!).

Description:—Twining herbs, 3–5 m. Stem slender, striate, brownish villous, glabrescent with age. Leaves trifoliate; stipules ovate-lanceolate, 3–4 × 1–1.5 mm, brownish pubescent; petiole 2–7 cm, brownish villous as stem; rachis 4–11 mm; leaflets elliptic or ovate, 3.6–6.9 × 2.3–4.4 cm, chartaceous, obtuse to rounded at apex and base, mucronate at apex, densely pubescent adaxially, more hairy abaxially, secondary veins 5–7 pairs; lateral leaflets slightly smaller, oblique; petiolules 1.5–3 mm, villous; stipels setaceous, 2–3 mm. Pseudoracemes axillary, 5–12 cm, many flowered, 2–3 flowers per node; Bracts lanceolate, 3.5 × 0.5 mm, pubescent. Pedicels 1–2 mm, pubescent; bracteoles 2, lanceolate, 2 × 0.5 mm, adnate to the base of the calyx, pubescent. Calyx tubular, obliquely truncate, sparsely pubescent, 4–5 mm. Corolla yellow; standard suborbicular, 7–8 mm, emarginate at apex, margins reflexed, auricles small; wings oblong, ca. 8 mm, rounded at apex, with a basal claw ca. 5 mm, lateral callosities crescent shaped, auricle small on upper

margin; keels triangular, obtuse at apex, with a basal claw ca. 5 mm, auricle small. Stamens (9+1) diadelphous, 8 mm; anthers uniform, alternately on and short filaments. Ovary shortly stipitate, glabrous, with 3–4 ovules; style glabrous; stigma capitate. Pods subfalcate, 3–4 cm, glabrous.



FIGURE 1. *Dumasia prazeri* Pradeep & M. P. Nayar A. Flowering branch; B. Pods. Photographs by Bo Pan.

Distribution and habitat:—*Dumasia prazeri* is distributed in China (Yunnan, newly recorded) and Myanmar. It grows under pine forest.

Phenology:—Flowering December to next January, fruiting February to March.

Chinese name:—The Chinese name of *Dumasia prazeri* is given here as 小花山黑豆, in which “小花” means small-flowered, as it bears the smallest flowers (only ca. 7–8 mm) in the genus; “山黑豆” is the Chinese common name for the genus *Dumasia*.

Notes:—*Dumasia prazeri* was only known from the type locality for a long time, and no more specimens had been collected since the type specimens. One collection stored in HITBC from Jingdong County of Yunnan Province was traced during our herbarium work, and a further two small populations of the species were found in Zhenyuan County during our field work in Southern Yunnan, so here we report it as a new record for the flora of China.

Iconography citation:—Pradeep & Nayar (1990: 110): figure 1.

Conservation status:—Except for the type locality, only three populations of *Dumasia prazeri* with ca. 5 individuals were found. According to IUCN Categories (2019), the species is considered here as **Data Deficient (DD)**. Additional surveys for this species are needed.

Specimens examined:—CHINA. Yunnan: Jingdong County, Wenlong, Sanchaqing, roadside, 26th December 2003, T. Y. Zhao, C. W. Duan, & Y. L. Shi 66 (HITBC). Zhenyuan County, near an agritourism resort outside the town, moist slope, 8th January 2012, B. Pan 7 (HITBC). Zhenyuan County, Xieqipo Park, 4th February 2012, B. Pan 14 (HITBC).

3. *Dumasia yunnanensis* Y. T. Wei & S. K. Lee (1985: 159). Fig. 2 & Fig 4A.

Type:—CHINA. Yunnan: Kunming, 9th November 1938, *H. K. Teng 171* (holotype KUN). Yunnan: Kunming, Xishan, Qiongzhusi, in open thickets, 4th October 1946, *K. M. Feng 10401* (paratype KUN!). Yunnan: Sung-ming, Kuo-Tung, alt. 2200 m, on slopes, 24th August 1958, *B. Y. Qiu 54981* (paratype PE!). Yunnan: Sung-ming, Kuo-Tung, alt. 2200 m, in thickets, 10th October 1950, *P. I. Mao 156* (paratype KUN!). Sichuan: Huili County, Beimashe, alt. 2550 m, at roadside, 3rd October 1958, *C. Ho 11544* (paratype SM!).

Description:—Perennial twinning herbs, 1–6 m, old plants with a semi-woody rootstock. Stem slender, sparsely pubescent. Leaves trifoliolate; stipules small, 1–2 mm, ovate to lanceolate, longitudinal striate, persistent; petioles 1–9 cm, glabrous to sparsely pubescent; leaflets membranous, elliptic ovate, terminal one 1–5 × 0.6–3 cm, lateral ones smaller and oblique, sparsely pubescent on both surfaces, apex obtuse, sub-rounded or retuse, mucronate, base rounded, broadly cuneate or nearly truncate; stipels small, setaceous; petiolules 2 mm. Pseudoracemes axillary, **usually shorter than the petioles of their subtending leaves**, 1–4 cm; peduncles short; bracts and bracteoles setaceous, small. Pedicels 1–2 mm. Calyx tubular, obliquely truncate at the mouth part, 9 mm, sparsely pubescent. Corolla yellow, 15–18 mm, petals subequal in length; standard obovate; wings elliptic, keels with long basal claws. Pods linear to subfalcate, laterally compressed and slightly curved, 3–5 cm × 4–6 mm. Seeds brownish black, ellipsoid, laterally compressed.

Distribution and habitat:—*Dumasia yunnanensis* is distributed in Bhutan, China (Sichuan, Tibet and Yunnan), India, and Nepal, and perhaps also in Myanmar. It grows in forests, roadsides, hillslopes, and thickets, at elevations between 800–2500 m above sea level.

Phenology:—Flowering from September to October; fruiting from November to December.

Iconography citation:—Wei & Lee (1985: 160): figure 2.

Conservation status:—According to IUCN Categories (2019), *Dumasia yunnanensis* was considered as **Least Concern (LC)**.

Notes:—*Dumasia yunnanensis* is here re-circumscribed. It is distributed north of the Tanaka Line. It is similar to *D. kurziana* (see the treatment below) morphologically, but *D. yunnanensis* bears pseudoracemes usually shorter than the petioles of their subtending leaves (vs. pseudoracemes usually longer than their subtending leaves in *D. kurziana*). The differences in length of inflorescences may help to distinguish the two species. The two species had been confused for a long time, but the molecular phylogeny showed that they are distinct species (Jiang *et al.*, 2020).

One variety of *D. yunnanensis*, viz. *Dumasia yunnanensis* var. *arunachalensis* (S. V. Pradeep & M. P. Nayar) B. Pan *et al.* & X. Y. Zhu (2010: 252) was recognized by Pan & Zhu (2010). This variety is currently only known from the type specimens, and differs from *D. yunnanensis* var. *yunnanensis* only by its ciliate leaflets. Its distribution area is more in line with *D. yunnanensis* re-circumscribed here, however, in the plate provided by Pradeep & Nayar (1991), the inflorescences are longer than petioles of their subtending leaves. The status of this variety needs further assessment. Here we retain its status as a variety of *D. yunnanensis* temporarily, since there is no more available material for further research.

Specimens examined:—CHINA. Sichuan: Huili, Beimashe, roadside, near cropland, alt. 2550 m, 3rd October 1958, *Z. He, S. G. Tang & B. Q. Li 11544* (SM). Huili, 1932, *T. T. Yü 1621* (PE). Xichang, Huili, near Yimen, hill slopes, 7th October 1958, *Anonymous 11644* (SM). Zhaojue, Fucheng District, Chengxi, alt. 2130 m, 17th September 1979, *Zhaojue Exped. 0986* (SM). Tibet: Dirang Dzong, Tsangpo Valley, alt. 5000–6000 ft, 13th October 1935, *F. Kingdon Ward 12424* (BM). Yunnan: Chengjiang, Yanglangcun, roadside, alt. 1800 m, 28th August 1939, *X. Wang 47137* (IBSC). Dayao, Tanhua, in the vicinity of Yangchishuiqing village, roadside, mixed forest margin, alt. 2324 m, 23rd September 2015, *J. Cai & S. F. Qin 15CS11352* (KUN). Kunming, Xishan, Taihuasi, in sparse forest, moist slopes, 22nd September 1955, *Anonymous 51063* (KUN, PE). Kunming, Qiongzhusi, in forest, 1st September 1984, *H. Ohashi 1647* (KUN). *ibid.*, alt. 1900 m, 20th August 1985, *Anonymous 85-56* (PE). *ibid.*, alt. 2000 m, 23rd October 1978, *A. J. Li 7858* (PE). *ibid.*, 8th October 2006, *B. Pan 200609018* (PE). *ibid.*, 10th October 2020, *K. W. Jiang, H. Y. Wu, H. Z. Feng, Z. Kang et al. JTZ01* (NPH). *ibid.*, alt. 2200 m, 25th November 1945, *T. N. Liou 14532* (PE). Kunming, Kunming Institute of Zoology, 10th September 1986, *H. S. Men & X. C. Zhang s. n.* (PE). Luquan, Erqu, Zhongping, Cilishan, under dense forest, moist places, alt. 2500 m, 14th November 1952, *P. I. Mao 1770* (PE). Luquan, Sayingpan, Sayongshan, in thickets, under forest, 28th October 2006, *B. Pan 200609035* (PE). Luquan, Sayingpan, *Anonymous s. n.* (PYU). Luquan, Sayongshan, alt. 2500 m, 10th October 1964, *Anonymous s. n.* (PYU). Shuangbai, Tuodian, Chayeqing, in valley, 5th October 1958, *S. Q. Huang 198* (KUN). Songming, Guodong, hill slopes, 24th August 1957, *B. Y. Qiu 54981* (PE). *ibid.*, alt. 2200 m, 10th October 1950, *P. I. Mao 156* (KUN, PE). Wuding, Shishan, under *Castanopsis orthacantha* forest, moist places, alt. 2200 m, 15th October 1960, *Anonymous 60-162* (KUN). Wuding, Shizishan, *Anonymous s. n.* (PYU). Heqing, Lianping, Fengchuiling, in forest 2nd August 1929, *R. C. Ching 23825* (PE). *ibid.*,

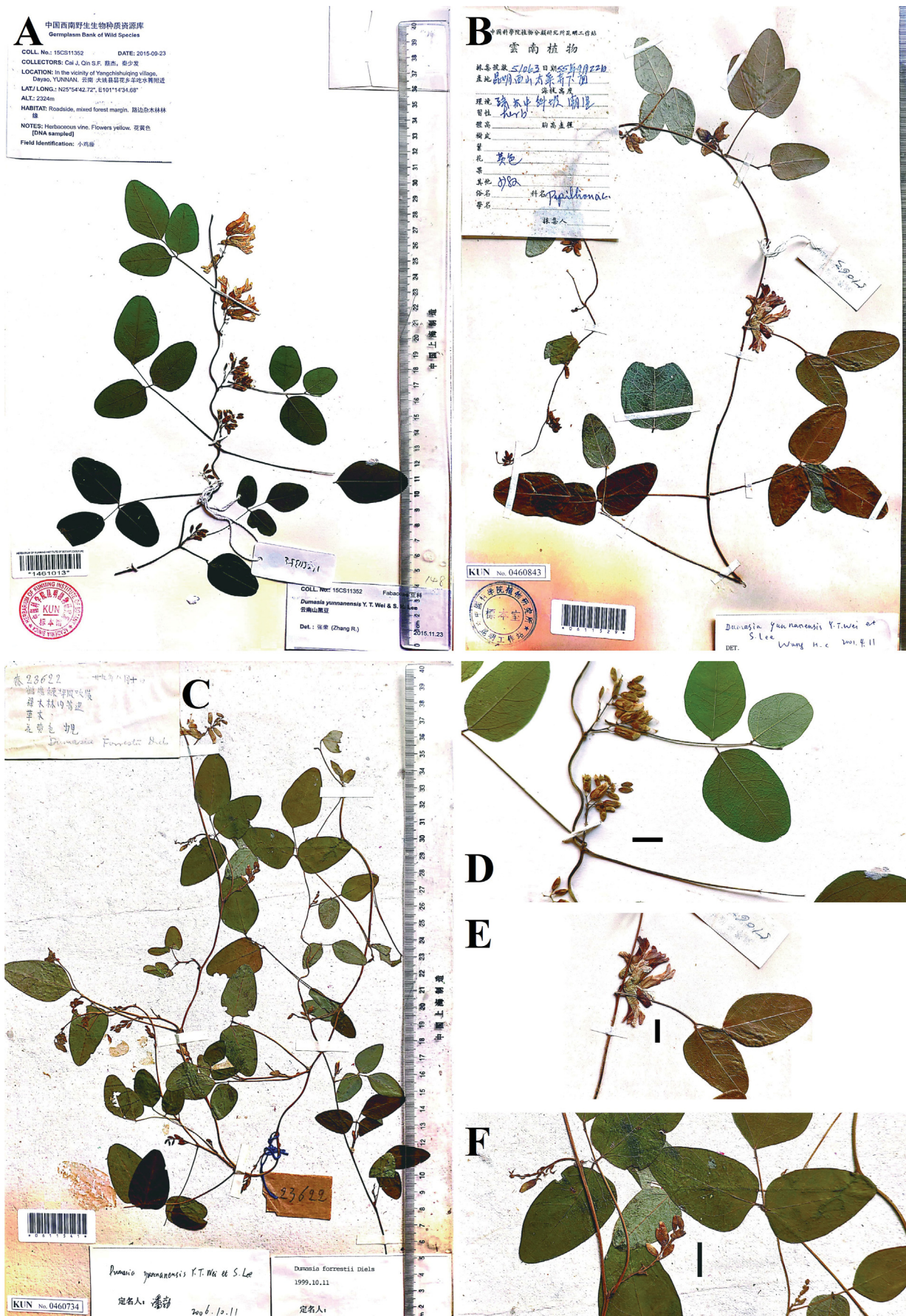


FIGURE 2. *Dumasia yunnanensis* Y. T. Wei & S. K. Lee **A & D.** *J. Cai & S. F. Qin 15CS11352* (KUN) from Dayao, Yunnan; **B & E.** *Anonymous 51063* (KUN) from Kunming, Yunnan; **C & F.** *R. C. Ching 23622* (KUN) from Heqing, Yunnan. **D, E & F** showing the shorter inflorescences compared to the petioles of the subtending leaves. Scale bar = 1 cm. © Herbarium, Kunming Institute of Botany, CAS.

in valley, mixed woods, 10th August 1929, *R. C. Ching* 23622 (KUN, PE). Dali, September 1929, *Anonymous* 28092 (PE). Without locality or date: *T. T. Yü* 17873 (PE). *Kunming Station* 51063 (PE). *Kunming Institute of Botany, the Chinese Academy of Sciences* 596211 (PE). **NEPAL**. W Nepal, *H. Flatt* 105 (BM).

4. *Dumasia kurziana* (Predeep & M. P. Nayar) B. Pan *bis*, B. Tian & K. W. Jiang, *comb. & stat. nov.* Fig. 3 & Fig. 4B.

Type:—MYANMAR. Pegu: Pookie Pine 7, alt. 4000–5000 ft., *S. Kurz* 1699 (holotype CAL; isotype CAL). CHINA. Yunnan: Szemao, West Mount Forests, alt. 5000 ft., *A. Henry* 12453 & 12872 (paratypes CAL, K!).

Basionym:—*Dumasia nitida* Chun ex Y. T. Wei & S. K. Lee (1985: 161) var. *kurziana* Predeep & M. P. Nayar (1991: 275).

Description:—Perennial twining herbs, 1–6 m. Stem slender, terete, subglabrous or sparsely pubescent. Leaves pinnately trifoliolate; stipules small, lanceolate, 2–3 × ca. 1 mm, striate, brownish pubescent when young, glabrescent with age; petioles glabrous or sparsely pubescent, 0.4–5 cm; rachis 0.1–1.2 cm; leaflets membranous to chartaceous, adaxial surface glabrous to glabrescent, abaxial surface sparsely pubescent, secondary veins 4–6 pairs; terminal leaflet elliptic to ovate, 0.5–4.2 × 0.3–2.8 cm, apex emarginate, obtuse or acute, apiculate, base rounded or broadly cuneate; lateral ones slightly smaller and oblique; stipels setaceous, 1–2 mm; petiolules 1–3 mm, sparsely pubescent. Pseudoracemes axillary, **usually longer than the petioles of their subtending leaves**, 2–9 cm, single or several clustered in axil, 4–30-flowered; bracts lanceolate, 1–1.5 × 0.5 mm. Pedicel 2–3 mm, sparsely pubescent; bracteoles 2, below the calyx, ovate, 1 mm. Calyx tubular, 9 mm, obliquely truncate at the calyx mouth. Corolla yellow; standard obovate, 15–17 mm, emarginate at apex, with a basal claw 8 mm; wings oblong to oblanceolate, 14–15 × 2 mm, obtuse at apex, with a basal claw 10–13 mm; keels 14–15, lamina subtriangular. Stamens (9+1) diadelphous; 15–16 mm; anthers uniform, alternately on long and short filaments. Ovary linear, shortly stipitate, 6–6.5 mm, glabrous, 5–6-ovuled; style long, filiform, upcurved, 8.5–9 mm; stigma capitate. Pods linear to subfalcate, 2.6–5 × 0.5–0.8 cm, glabrous, beaked at apex, stipitate at base. Seeds 2–6, ellipsoid, laterally compressed, brownish black, 4.5–5 × 3.5–4 × 2.5 mm.

Distribution and habitat:—*Dumasia kurziana* is distributed in China (Yunnan) and Thailand, perhaps also in Myanmar. The habitat of the species is the same as *D. yunnanensis*.

Phenology:—Flowering from September to October; fruiting from November to December. In Thailand, the species was recorded in flower and fruit from September to February of the following year (Meeboonya *et al.* 2019).

Chinese name:—The Chinese name of *Dumasia kurziana* is given here as 滇南山黑豆, in which “滇南” means Southern Yunnan, as the species is distributed south of the Tanaka Line in Yunnan Province; “山黑豆” is the Chinese common name for the genus *Dumasia*.

Iconography citation:—Predeep & Nayar (1991: 277): figure 1.

Conservation status:—According to IUCN Categories (2019), *Dumasia kurziana* is considered as **Least Concern (LC)**.

Notes:—*Dumasia nitida* var. *kurziana* had long been considered as a synonym of *D. yunnanensis*, however, the phylogenetic results of Jiang *et al.* (2020) showed the two taxa have independent lineages, in which *D. yunnanensis* is distributed in Northern Yunnan and neighboring Sichuan, while *D. nitida* var. *kurziana* is distributed in Southern Yunnan and Thailand. Therefore a new combination, *D. kurziana* is proposed here.

Specimens examined:—**CHINA. Yunnan:** Cangyuan, Banhong, Nanban Village, in broadleaf forest, alt. 1250 m, 28th October 1989, *G. D. Tao & X. W. Li* 39908 (HITBC). Ching-Tung, Mao-Chia-Fen, grassy slope, alt. 1800 m, 12th October 1939, *M. K. Li* 0493 (KUN, HITBC). Jingdong, Jinping, Huangcaoling, 5th October 2020, *Q. Tian et al.* 3308230831 (NPH). Jinggu, Weng'an, Malutang, in forest, alt. 1900 m, 21st November 1986, *Z. H. Yang* 86315 (IBSC). Lincang, slopes, in thickets, roadside, alt. 1600–2100 m, 2nd September 1957, *J. S. Xin* 630 (KUN, PE). Lincang, Poshang, among thickets, alt. 2500 m, 4th October 1938, *T. T. Yü* 17876 (PE). Luchun, Mayu, alt. 840–1300 m, 30th October 1995, *S. K. Wu, Y. M. Shui, Y. P. Yang, L. H. Liu, J. H. He, J. Murata, H. Nagamasu, T. Sugawara, X. Chen & N. Murakami* 391 & 805 (KUN). *ibid.*, alt. 840–1300 m, 31st October 1995, *S. K. Wu, Y. M. Shui, Y. P. Yang, L. H. Liu, J. H. He, J. Murata, H. Nagamasu, T. Sugawara, X. Chen & N. Murakami* 2143 (KUN). Shiping, Longwu, on ravine, alt. 1900 m, 15th September 2011, *J. W. Li* 1051 (HITBC). Shiping, 5th October 2020, *X. W. Sun* SunXW002 (NPH). Shuangjiang, Erqu, Mingkubaka, sparse forest, roadside, alt. 1800 m, 3rd October 1957, *J. S. Xin* 1212 (KUN, PE). Tonghai, Lishan, Xiangping, in the secondary forest, alt. 1900 m, 13th August 1989, *Yuxi Exped.* 0808 (KUN). Xishuangbanna, Mengla County, Yaoqu, under forest, moist places, November 1982, *Exped.* 34241 (HITBC). Xishuangbanna, Menghun, waterside, moist places, alt.

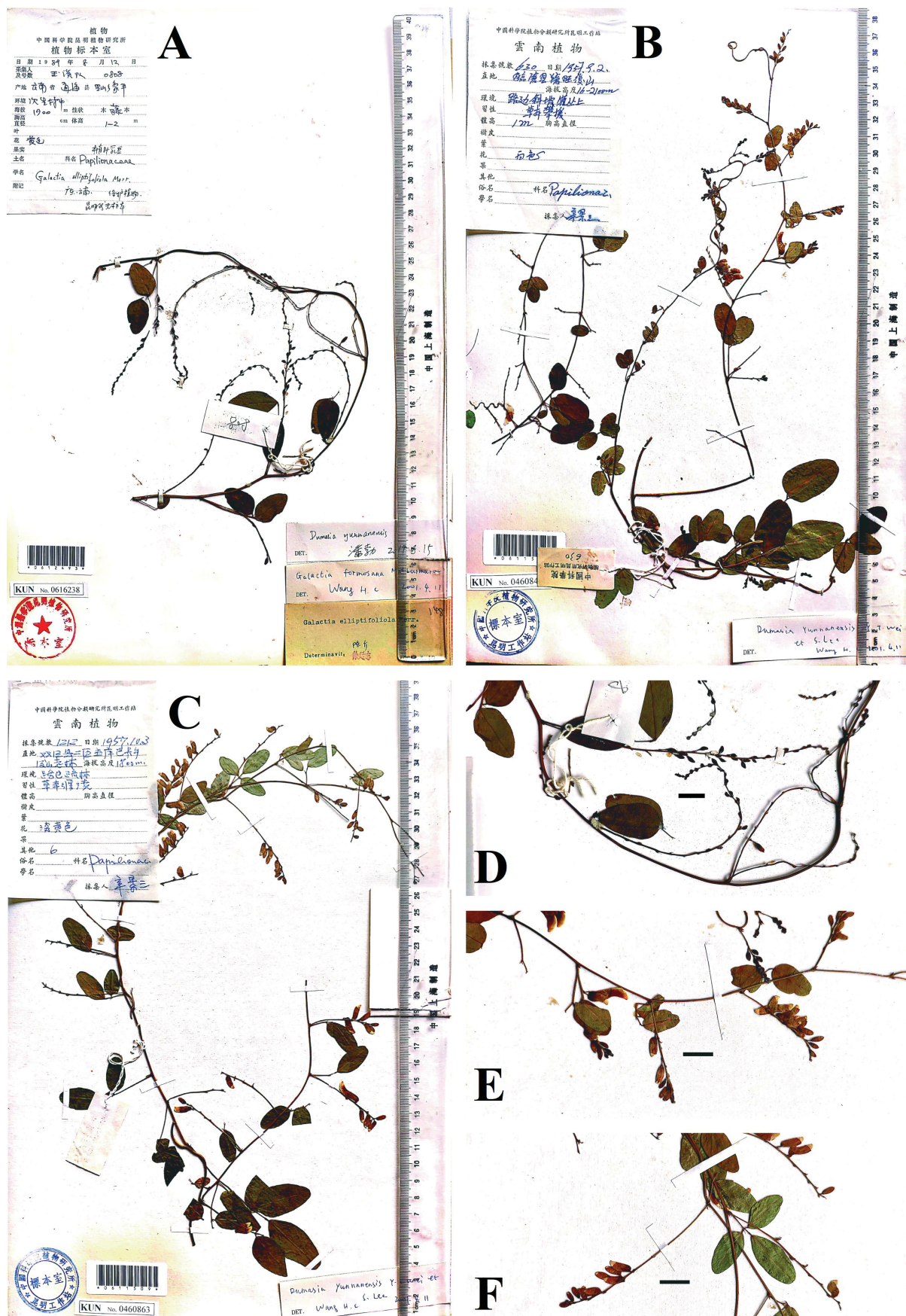


FIGURE 3. *Dumasia kurziana* (Predeep & M. P. Nayar) B. Pan bis, B. Tian & K. W. Jiang A & D. Yuxi Exped. 0808 (KUN) from Tonghai, Yunnan; B & E. J. S. Xin 630 (KUN) from Lincang, Yunnan; C & F. J. S. Xin 1212 (KUN) from Shuangjiang, Yunnan. D, E & F showing the shorter inflorescences compared to the petioles of their subtending leaves. Scale bar = 1 cm. © Herbarium, Kunming Institute of Botany, CAS.

1300 m, 18th November 1955, *P. I. Mao* 7401 (PE). Xishuangbanna, Menghai County, Nannuo, tea plantation, in sparse forest, moist places, alt. 1360 m, 5th November 1955, *P. I. Mao* 7078 (KUN, PE). Yuanjiang, Erqu, Yangmanlai, slopes, in thickets, moist places, alt. 800 m, 21st October 1964, *Y. H. Li* 5670 (HITBC). Yuanjiang, Nanxi Laolin, hill slopes in the valley, sparse forest, moist places, alt. 1850 m, 3rd November 1964, *Y. H. Li* 5840 (HITBC). **THAILAND. Northern:** Chengmai, 12th December 1904, *C. C. Hosseus* 205 (BM). Chiang Mai, Doi Inthanon, common on hill in evergreen forest, 22nd November 1964, *K. Bunchuai* 36913 (K). Chiang Mai, Doi Chiang Dao, not common in evergreen forest, 18th November 1963, *K. Bunchuai* 1338 (K). Doi Angka, alt. 1630–1700 m, 2nd January 1927, *H. B. G. Garrett* 365 (K). Doi Nang Ka, 1st November 1930, *A. F. G. Kerr* 3290 (BM). Doi Nang Ka, Chiangmai, 1st November 1930, *Pui* 3290 (K). Payap, Doi (mt) Buak Ha, W. of Chiangmai, open, grassy vegetation along roadside, alt. ca. 1575 m, 30th November 1965, *E. Hennipman* 3178 (K). **Eastern:** Nakhon, Ratchasima, Khao Yai National Park, Khao Kieo, evergreen forest, alt. ca. 1200 m, 18th October 1969, *C. F. van Beusekom* & *C. Charoenpol* s. n. (K).



FIGURE 4. Flower dissections of *Dumasia yunnanensis* Y. T. Wei & S. K. Lee (A) and *D. kurziana* (Predeep & M. P. Nayar) B. Pan bis, B. Tian & K. W. Jiang (B). (fl) Mature flower; (c) Calyx; (a) anthers; (g) gynoecium; (st) Standard; (wg) Wings; (k) Keels. Scale bar = 1 cm. A by Kai-Wen Jiang, B by Qin Tian.

5. *Dumasia zhangjiajieensis* Y. K. Yang, L. H. Liu & J. K. Wu (2004: 67). Fig. 5

Type:—CHINA. Hunan: Dayong County, Zhangjiajie, Luobota, in sylvis monti, alt. 680 m, 6th July 1981. *Lin-Han Liu* 762254 (holotype HNNU).

Dumasia wulingyuaniea Y. K. Yang, L. H. Liu & J. K. Wu (2004: 67), *nom. inval. pro syn.*

Description:—Twining herbs, 2–3 m. Stem slender, terete, multi-branched, sparsely pubescent when young, glabrescent. Leaves trifoliolate; stipules and stipels subulate to setaceous, 0.5–1.7 mm, persistent; petioles 3.4–5.2 cm; leaflets membranous to thin chartaceous, nearly glabrous on both surfaces, light green adaxially, glaucous abaxially, blunt and mucronate at apex, subrounded to broadly cuneate at base, secondary veins 4–6 pairs, reticulate veins obvious on both surfaces; terminal leaflet ovate, elliptic or ovate oblong, 2.5–4.8 × 1.8–3.7 cm; lateral ones smaller, oblique, 1.7–4 × 1–2.7 cm; petiolules 1–3 mm. Pseudoracemes axillary, 5.5–16 cm, with repand wings at base of peduncles, 9–16-flowered; wings 3.2–3.7 cm × 1–4 mm; bracts and bracteoles setaceous or subulate, 0.5–1.2 mm, minute. Calyx tubular, grass green, 5–7 × 3.5–4 mm, longitudinal veined, obliquely truncate at the calyx mouth, gibbose at the base. Corolla light yellow. Standard obovate, 18 × 8 mm, apex emarginate, auriculate, attenuate to a short claw at base; wing petals falcate, 15 × 2.5 mm, apex rounded, attenuate to a 10 mm claw; keels nearly subequal as the wing petals, with a 5.5 mm-blade and 11 mm-claw. Stamens 10, diadelphous, 15–17 mm. Ovary linear, with a slender stipe surrounded by a basal disc; style dilated at the bending part; stigma capitate and hairy. Pods moniliform, glabrous, acuminate at apex, attenuate at base, 4–5-seeded, conspicuously constricted between the seeds, valves thin leathery. Seeds subglobose and dorsoventrally compressed, ca. 6 × 6 × 3 mm, bluish black, hilum raised, ca. 3 mm long.

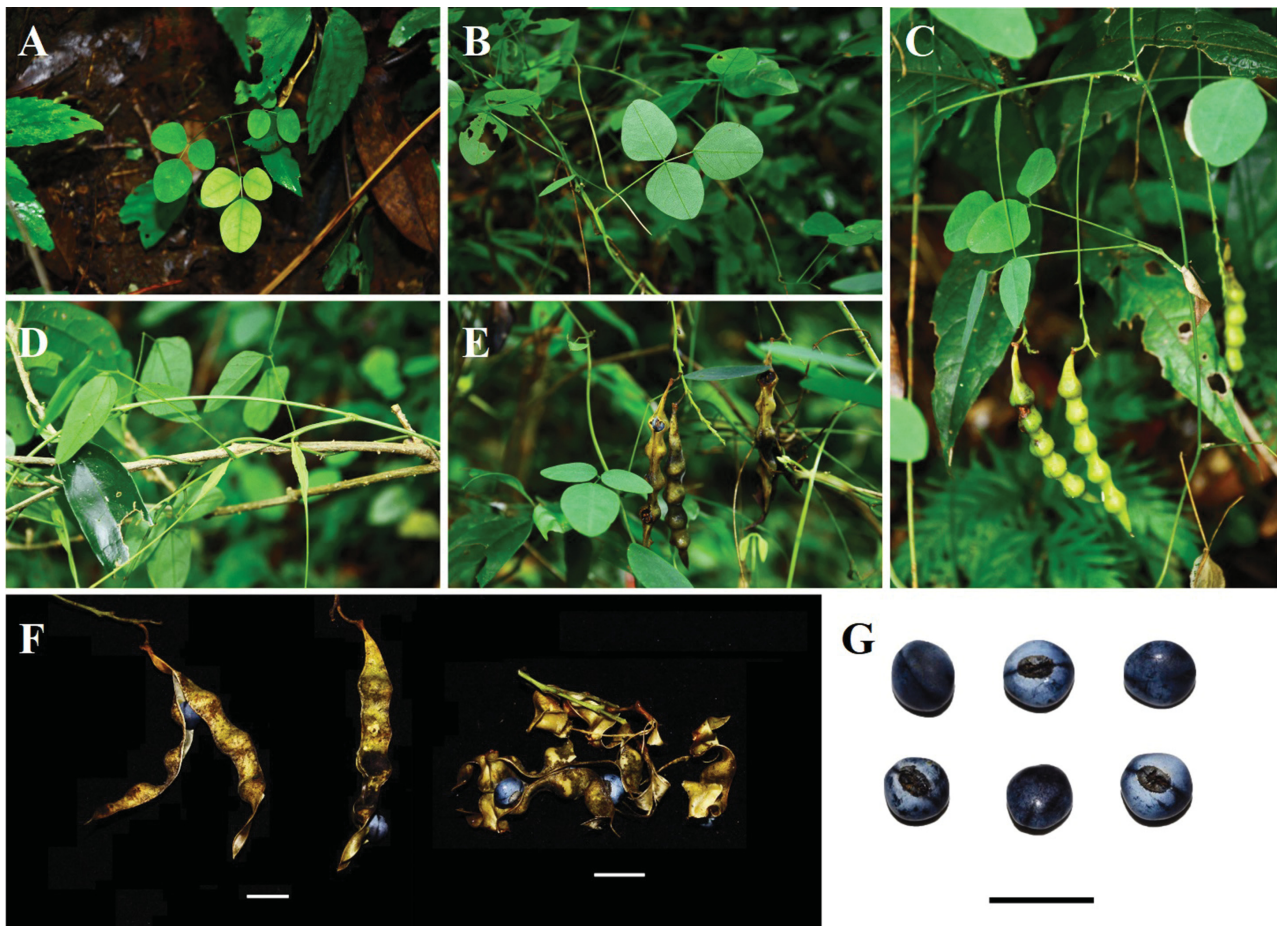


FIGURE 5. *Dumasia zhangjiajieensis* Y. K. Yang, L. H. Liu & J. K. Wu A. Vegetative branches, showing the adaxial surface of leaves; B. Abaxial surface of a leaf; C. Branches with immature fruits; D. The winged peduncles; E. Fruiting branches; F. Pods; G. Seeds. Scale bar = 1 cm. Photographs by Bo Pan.

Distribution and habitat:—*Dumasia zhangjiajieensis* is currently known from the type locality, Hunan Province, and several other photo records from Luzhou, SE Sichuan Province (<http://ppbc.iplant.cn/tu/4295622>). More occurrences may lie between the two sites, which includes Chongqing, Guizhou, and Hubei. It grows on very shaded and moist slopes.

Phenology:—Flowering in May to July; fruiting from June to September.

Notes:—*Dumasia zhangjiajieensis* can be easily characterized by its winged peduncle, which is unique in the genus. It bears moniliform pods, which are similar to those of *D. villosa* DC. (1825: 97) but totally glabrous.

Iconography citation:—Yang *et al.* (2004: 74): figure 3.

Conservation status:—*Dumasia zhangjiajieensis* is poorly known and collected. The Zhangjiajie population has only ca. 30 mature individuals. According to IUCN Categories (2019), the species is considered as **Data Deficient (DD)**. Additional field surveys and observations are needed.

Specimens examined:—**CHINA. Hunan:** Dayong County, Zhangjiajie, Zicaotan, alt. 500 m, 10th September 1985, L. H. Liu 016895 (HNNU). *ibid.*, 24th June 2002, L. H. Liu & G. W. Hu 23392 (HNNU). *ibid.*, 21st September 2017, B. Pan 2737 (HITBC).

Key to *Dumasia* taxa

1. Leaflets of upper leaves cordiform..... *D. cordifolia*
1. Leaflets not cordiform.....2
2. Leaflets broadly ovate to suborbicular; bracts and bracteoles 7–8 mm; stem obviously quadrangular..... *D. forrestii*
2. Leaflets not as above; bracts and bracteoles 0.5–4 mm; stem terete, or slightly quadrangular.....3
3. Leaflets oblong..... *D. henryi*
3. Leaflets ovate to elliptic.....4
4. Stem and petioles densely covered with brown hirsute hairs..... *D. hirsuta*
4. Stem and petioles without brown hirsute hairs.....5
5. Flowers small, 7–8 mm..... *D. prazeri*
5. Flowers larger, 14–18 mm.....6
6. Pods entirely torulose, *viz.* constricted between all seeds.....7
6. Pods usually not torulose, sometimes constricted where abortive seeds inserted.....10
7. Peduncles of pseudoracemes winged at base..... *D. zhangjiajieensis*
7. Peduncles of pseudoracemes not winged at base.....8
8. Stem, petioles, and leaflets glabrescent; pods glabrous..... *D. villosa* subsp. *leiocarpa*
8. Stem, petioles, and leaflets pubescent; pods villous.....9
9. Seeds 1–2..... *D. villosa* subsp. *bicolor*
9. Seeds usually 3–4..... *D. villosa* subsp. *villosa*
10. Leaves and stems glabrous or glabrescent..... *D. truncata*
10. Leaves and stems sparsely pubescent.....11
11. Leaflet margin ciliate..... *D. yunnanensis* var. *arunachalensis*
11. Leaflets without marginal pubescence.....12
12. Pseudoracemes usually longer than the petioles of their subtending leaves..... *D. kurziana*
12. Pseudoracemes usually shorter than the petioles of their subtending leaves..... *D. yunnanensis* var. *yunnanensis*

Conclusion

It was considered that five species were endemic to China (Sa & Gilbert 2010), including two names which were synonymized by Pan & Zhu (2010). In this study, we finally recognize ten species (including two subspecies and one variety) of *Dumasia* DC., among which only three species [*D. henryi* (Hemsl.) R. Sa & M. G. Gilbert (2010: 244), *D. hirsuta*, and *D. zhangjiajieensis*] could be considered as endemic to China, while all the other species may be distributed to national borders or have wider distributions than previously thought (see Pan & Zhu 2010).

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