



## *Lespedeza hengduanshanensis* comb. & stat. nov. (Leguminosae: Papilionoideae: Desmodieae) from the Hengduan Mountains of SW China

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### Abstract

*Lespedeza fasciculiflora* Franchet is currently divided into two varieties, var. *fasciculiflora* and var. *hengduanshanensis* C.J. Chen. A detailed comparison of the plants from wild populations and specimens of the two varieties revealed that var. *hengduanshanensis* was sufficiently distinct from var. *fasciculiflora* to be recognized as a separate species. Our phylogenetic analysis based on DNA sequences, moreover, showed that the two varieties are not even closely related. We therefore here elevate the status of *L. fasciculiflora* var. *hengduanshanensis* to species *L. hengduanshanensis* (C.J. Chen) B. Xu, X.F. Gao & Li Bing Zhang, comb. & stat. nov..

**Key Words:** Fabaceae

### Introduction

*Lespedeza* comprises about 40 species, with a disjunct distribution in East Asia and eastern North America, and also an introduced range from Malesia and NE Australia to South Africa. Two subgenera are traditionally recognized based on the presence or absence of cleistogamous flowers (Ohashi 1982; Li and Chen 1995; Ohashi *et al.* 2009; Huang *et al.* 2010), although both groups are clearly not monophyletic (Xu *et al.* 2012).

*Lespedeza fasciculiflora* Franchet (1890: 169) var. *hengduanshanensis* C.J. Chen (1992: 375), distributed in the Hengduan Mountains of SW China, was recognized based on several morphological characters (Chen 1992). However, Ohashi *et al.* (2009) and Ohashi and Nemoto (in Huang *et al.* 2010) believed that *L. fasciculiflora* var. *hengduanshanensis* should be included within *L. fasciculiflora* var. *fasciculiflora* and treated the former as a synonym of the latter, while Huang (in Huang *et al.* 2010) retained the two varieties. After careful morphological study of herbarium material and field observations of the two varieties, we found that two taxa can be distinguished by the following characters (Figs. 1, 2): plants of *L. fasciculiflora* var. *fasciculiflora* are herbs and have stems and branchlets thinner (ca. 1 mm in diameter) and less ligneous, densely white-hirsute, leaflets obcordate, abaxially densely villous and adaxially subglabrous, terminal leaflets petiolulate, pedicels 3–6 mm, corolla pink or purplish red, and pod smaller (pods from chasmogamous flowers ca. 2.6 mm long × 1.6 mm wide, pods from cleistogamous flowers ca. 2.2 mm long × 1.5 mm wide). In contrast, plants of *L. fasciculiflora* var. *hengduanshanensis* are subshrubs and have stems and branchlets that are more robust (3–6 mm in diameter) and ligneous, adpressed strigulose, leaflets obovate, abaxially densely hoary and adaxially sparsely or sometimes densely pubescent, terminal leaflets sessile, pedicels 1–2 mm, corolla white or yellowish, with pink and purple markings, pod larger (pods from chasmogamous flowers ca. 5 mm long × 2.7 mm wide, pods from cleistogamous flowers ca. 3.5 mm long × 2.5 mm wide).

Our molecular-phylogenetic analysis of DNA sequences of the nuclear ribosomal internal transcribed spacer (ITS) and five chloroplast loci (*rpl16*, *rpl32-trnL*, *rps16-trnQ*, *trnL-F*, and *trnK/matK*) resolved the position of *L. fasciculiflora* var. *hengduanshanensis* clearly distant from the typical variety (Xu *et al.* 2012). Here we elevate *L. fasciculiflora* var. *hengduanshanensis* to the status of species.

**Basionym:**—*Lespedeza fasciculiflora* Franchet var. *hengduanshanensis* C.J. Chen (1992: 375).

**Type:**—CHINA. Sichuan: Batang City, the back mountain of Suwalong, on the eastern bank of the Jinsha River, in thickets of the bank, 2600 m, 30 Aug. 1981, *Qinghai-Xizang Exped. 81-5214* (holotype PE-01432541!, isotype KUN).

Subshrub, perennial, 10–50 cm tall. Stems much branched at base to middle, ascending, stems and branchlets densely adpressed strigulose. Leaves alternate, petiolate, 3-foliolate; Stipules persistent, linearly triangular, 2–4 mm long, distinctly 3-veined; petioles 1–10 mm, densely strigulose; leaflets obovate, terminal leaflets 4–10 × 3–6 mm, slightly larger than lateral ones, abaxially densely hoary, adaxially sparsely or sometimes densely pubescent, base cuneate, apex emarginate, mucronate, rachis less than 2 mm long. Cleistogamous flowers in leaf axils, sessile, fruit-bearing. Chasmogamous flowers in axillary racemes, distinctly longer than subtending leaves; peduncles 0.3–2 cm, densely pubescent, 2–6-flowered, two flowers per bract; pedicels 1–2 mm long, densely pubescent; bracteoles 2 at base of calyx, lanceolate, 1.5–2.5 mm long, equal to or slightly longer than calyx tube. Flowers 7–11 mm long. Calyx 5–8 mm, 5-lobed, upper 2 lobes connate, outer surface densely hirsute, lobes 2–3× as long as tube, linear-lanceolate. Corolla white or yellowish, with pink and purple markings, slightly longer than calyx; standard obovate, 6.5–10.8 × 4.5–6.5 mm (including claw ca. 2 mm long), claw with auriculate appendage at upper part; wings narrowly oblong, 5–9 × 1.5–2.5 mm (including claw ca. 2.5 mm long); keel petals narrowly elliptic, slightly shorter than or subequal to standard and slightly longer than wings, with purple markings at apex. Fruit brown, densely hirsute, reticulate veined. Pods from chasmogamous flowers elliptical, ca. 5 mm long × 2.7 mm wide, apex rostrate, 1–1.5 mm. Pods from cleistogamous flowers elliptical, ca. 3.5 mm long × 2.5 mm wide, apex acuminate, ca. 0.3 mm. Seeds pale green and narrowly ovate.

**Geographical distribution and habitat:**—Sichuan, Xizang, Yunnan; in thickets of hot, arid river valleys.

**Phenology:**—Flowering (June–) July to August (–September); fruiting (late July–) August to September (–October).

**Additional specimens examined:**—CHINA. Sichuan: Derong, 14 Jul. 2014, *B. Xu et al. XB2014-96* (CDBI!); Kangding, 12 Jul. 2007, *X.F. Gao et al. 9384* (CDBI!); Kangding, 14 Jun. 2010, *X.F. Gao et al. 11886* (CDBI!); Kangding, 7 Nov. 2007, *B. Xu & W.G. Tu 405* (CDBI!); Maoxian, 9 Jun. 1959, *S. Jiang & C.L. Jin 00657* (PE!); Maoxian, 26 Jul. 1983, *Z.X. Tang 1516* (PE!); Maoxian, 16 May 2001, *X.F. Gao & W.P. Zhang 1021* (CDBI!); Xiaojin, 1 Sep. 2012, *Y.D. Gao et al. ABA015* (CDBI!). Xizang: Chayu, Aug. 1935, *Q.W. Wang 65470* (PE!). Yunnan: Deqing, 5 Nov. 2007, *X.F. Gao 16314* (CDBI!); Deqing, 4 Sep. 2007, *S.S. Zhou 4204* (HITBC!).

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