



Taxonomic notes on three species of *Epimedium* (Berberidaceae) endemic to China

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Abstract

Three species of *Epimedium* (Berberidaceae), *E. reticulatum*, *E. shuichengense* and *E. truncatum*, are controversial based on flower characteristics. In this paper, the descriptions of their flower characters of these three species are revised based on our extensive studies in herbaria and observations in the field and cultivation. *E. reticulatum* is transferred from ser. *Brachycerae* to ser. *Campanulatae*, and *E. shuichengense* is recognized as a member of ser. *Davidianae*. The holotype and isotypes of *E. reticulatum* represent two species, *E. reticulatum* and *E. membranaceum*, and the type material of *E. truncatum* has been lost. Here we lectotypify *E. reticulatum* and neotypify *E. truncatum*.

Key words: *Epimedium*, flower characters, revision, lectotype, neotype

Introduction

Epimedium Linnaeus (1753: 117) is the largest herbaceous genus of Berberidaceae, with about 58 species distributed disjunctly and very unevenly in temperate hilly or montane regions from Algeria in North Africa to Japan in Asia (Stearn 2002; Ying *et al.* 2011). China is the diversity center of *Epimedium*, and possesses about 48 species of the genus which are all endemics except *Epimedium koreanum* Nakai (1936: 63). Stearn's (2002) latest monograph of *Epimedium* used subgeneric, sectional and serial levels for the infrageneric classification, and classified all of China's endemic species of the genus into four series related with floral morphology, ser. *Campanulatae* Stearn (2002: 48), ser. *Davidianae* Stearn (2002: 55), ser. *Dolichocerae* Stearn (1938: 490), and ser. *Brachycerae* Stearn (1938: 500), in sect. *Diphyllon* (Kom.) Stearn (2002: 48), subgen. *Epimedium*.

Herb epimedii is a traditional Chinese medicine with verified functions against many diseases (Ma *et al.* 2011). Species of *Epimedium* also have been developed as new ornamental or shading plants (Ren *et al.* 2008, Avent 2010). About 30 Chinese species of *Epimedium* were published in the past three decades, and Chinese species of *Epimedium* have presented a number of taxonomic questions. *Epimedium reticulatum* C.Y. Wu ex S.Y. Bao (1987: 156), *Epimedium shuichengense* S.Z. He (1996: 209) and *Epimedium truncatum* H.R. Liang (1990: 322) are controversial on their floral characters (Stearn 2002, Guo *et al.* 2008, Ying 2001, Ying *et al.* 2011). Based on our extensive studies on the three species in herbaria, the field, and cultivation, we here revise their floral descriptions and adjust series regrouping for *E. reticulatum* and *E. shuichengense*. The holotype and isotypes of *E. reticulatum* include two species, *E. reticulatum* and *Epimedium membranaceum* K. Mey. (1922: 380), and all of the types of *E. truncatum* have been lost. We therefore designate a lectotype and five isolectotypes for *E. reticulatum*, and a neotype for *E. truncatum*.

Materials and Methods

Herbarium specimens were examined from the following herbaria: BCMM, GZTM, HGAS, HIB, HNNU, IMD, KUN, PE, SM, and SZ. Field investigation covered all the type localities of the three species. We also examined plants of the three species collected and transplanted to Wuhan Botanical Garden, the Chinese Academy of Sciences.

species of ser. *Davidianae*, *E. shuichengense* can be easily recognized by its long, elongated and slender rhizome, trifoliolate leaves and red ovate-oblong inner sepals.

Additional specimens examined:—CHINA. **Guizhou:** Shuicheng, *B.L. Guo 618* (IMD), *Q.H. Chen & P. Zhao 263* (HGAS), *Y.J. Zhang 302* (HIB), 375 (HIB).

3. *Epimedium truncatum* H.R. Liang (1990: 322).

Type:—CHINA. Hunan: Baojing, alt. 600–1000 m, 17 May 1986, *S.S. Yang 15* (BCMM, holotype), same locality, in thickets of slopes, alt. 250 m, 13 Apr. 1960, *Institute of Wildlife biology 1334* (neotype, **designated here!**: HNNU-00003009!). Fig. 1K–O, Fig. 2G–I.

Flowers ca. 1 cm in diam. Outer sepals purplish, apex obtuse, outer pair ovate-oblong, ca. 1 × 2 mm, inner pair broadly ovate, ca. 3 × 4 mm. Inner sepals white, ovate, ca. 5 × 3 mm, apex acute. Petals yellow, saccate with slightly lateral flanges at base, ca. 3 mm long.

Distribution and habitat:—*Epimedium truncatum* occurs in northwestern Hunan. It is often found in forest margins, thickets, weedy slopes, and stream sides in valleys, with elevations ranging from 250 m to 1400 m.

Phenology:—*Epimedium truncatum* flowers from April to May, and fruits from May to June.

IUCN Red List category:—*Epimedium truncatum* should be designated as Vulnerable (VU) according to IUCN Red List criteria (IUCN 2013), because of exploitation for medicinal use.

Notes:—In the protologue of *Epimedium truncatum* (Liang *et al.* 1990), the species was described with lanceolate and 2 mm long inner sepals and suborbicular, spurless and 1 mm long petals, but its illustration showed that its inner sepals were broadly ovate, and its petals were flabellate with slightly involute apex and broadly cuneate base. In *Flora Reipublicae Popularis Sinicae* (Ying 2001) and *Flora of China* (Ying *et al.* 2011), the inner sepals of *E. truncatum* were described as being consistent with its original description, while its petals were described colligating its original description and illustration. According to specimen examination, field investigation, and observations of material in cultivation, we found that its inner sepals are ovate, ca. 5 × 3 mm and with acute apex, and its petals are saccate, ca. 3 mm long and with slightly lateral flanges at base. Furthermore, the original descriptions on its outer sepals are also inaccurate and we here revise them.

No types of *E. truncatum* are found to exist, and according to Art. 9.7 of the ICN (McNeill *et al.* 2012), the specimen deposited in HNNU, *Institute of Wildlife Biology 1334*, sheet *Herb. 00003009*, is here designated as its neotype which was collected from the type locality and in good condition.

Additional specimens examined:—CHINA. **Hunan:** Baojing, *Institute of Wildlife biology 1334* (HNNU), *Y.J. Zhang 295* (HIB), 296 (HIB), 297 (HIB); Yongshun, *B.L. Guo A103* (IMD); Zhangjiajie, *B.L. Guo A35* (IMD), *B.L. Guo & X.Z. Luo 89018* (IMD), *Y.J. Zhang 231* (HIB).

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