A New Species of *Epimedium* (Berberidaceae) from Hubei, China

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Abstract. A new species of *Epimedium* L. (Berberidaceae), *E. shennongjiaensis* Yan J. Zhang & J. Q. Li, is described and illustrated from the Shennongjia National Nature Reserve, Hubei Province, China. The new species is distinctive and assigned to series *Davidianae* Stearn of section *Diphyllon* (Komarov) Stearn because of its large flowers and petals with expanded lamina and elongated spurs. Based on corolla characteristics, it is similar to *E. epsteinii* Stearn but is distinguished by its compact rhizomes, narrowly ovate and acuminate inner sepals (1.5–1.9 × 0.7–0.9 cm), and petals slightly shorter or nearly as long as the inner sepals with straight spurs (1.5–1.7 cm).

Key words: Berberidaceae, China, *Epimedium*, Hubei, IUCN Red List.

Epimedium L., as a temperate genus of Old World distribution, is the largest genus of herbaceous Berberidaceae with ca. 57 species distributed broadly from Japan to Algeria. China, where 47 species have been reported and the evolution of *Epimedium* has continued without interruption probably since the origin of the genus, is not only the richest in species of *Epimedium*, it is the only region where new species continue to be found (Ying, 2001; Stearn, 2002; He & Xu, 2003; Guo et al., 2007).

The new species was collected from Muyuping, Shennongjia National Nature Reserve, Hubei Province, China, on 2 May 2004, when it was flowering; it was then transplanted into the Wuhan Botanical Garden, Chinese Academy of Sciences, also in Hubei Province. It appears most closely related to *Epimedium epsteinii* Stearn, but differs from the latter in its rhizomes, leaflets, and perianth.

Epimedium shennongjiaensis Yan J. Zhang & J. Q. Li, sp. nov. TYPE: China. Hubei: cultivated at Wuhan Botanical Garden, CAS [collected in Muyuping, Shennongjia Natl. Nature Reserve], 30 Mar. 2007, *Y. J. Zhang 148* (holotype, HIB; isotype, HIB). Figure 1.

Species nova *Epimedio epsteinii* Stearn affinis, sed ab eo rhizomatibus compactis, foliis basi profunde cordatis, sepalis interioribus anguste ovatis apice acuminatis atque petalis sepalis interioribus paulo brevioribus vel aequilongis calcaribus strictis differt.

Flowering stems 18 cm or longer, bearing 2 opposite leaves or a single leaf; *rhizome* compact, 4.5–8 mm diam. *Basal and cauline leaves* with 3 leaflets; leaflets narrowly ovate, 6.5–11.2 × 3.7–6.1 cm, apex acuminate, margin spinose-serrate, base deeply cordate with a narrow sinus, lobes of the terminal leaflet equal and acute, those of the lateral leaflets very unequal with the inner lobe smaller and acute, and the outer one much larger and acute, coriaceous, persisting as green all winter, glossy adaxially, glaucous abaxially when mature and glabrate with scattered, minute, erect hairs. *Inflorescence* simple, racemose, few-flowered, with 8 to 22 flowers, 10–17 cm; pedicels ca. 2–2.7 cm, glabrous or sometimes glandular. *Flowers* large, 3–3.8 cm diam.; *outer sepals* soon falling, green or purple, outer pair oblong, to 4 mm, inner pair broadly ovate with white margins, to 5 mm; *inner sepals* narrowly ovate, white, 1.5–1.9 × 0.7–0.9 cm, apex acuminate; *petals* slightly shorter or nearly as long as inner sepals, deep purple; spur subulate, straight, 1.5–1.7 cm, expanded at base into lamina 5–6 mm high; *stamens* enclosed by the upward corolla extension, ca. 4 mm; filaments white, ca. 1 mm; anthers ca. 3 mm, pale yellow; pollen yellow. *Capsule* ca. 1 cm.

Habitat and distribution. *Epimedium shennongjiaensis* is found in forests and on valley slopes at ca. 1500 m elevation in Muyuping, Shennongjia National Nature Reserve, Hubei Province, China.

IUCN Red List category. *Epimedium shennongjiaensis* is assessed as a taxon of Least Concern (LC) according to IUCN Red List criteria (IUCN, 2001).

Phenology. The new species is known to flower in May in the field and in late March to mid April in cultivation.

Etymology. The specific epithet refers to the type locality.

Discussion. Stearn (2002) established section *Diphyllon* (Komarov) Stearn, which comprised all the Chinese species of *Epimedium* except for *E. koreanum* Nakai, and he divided the section into four series

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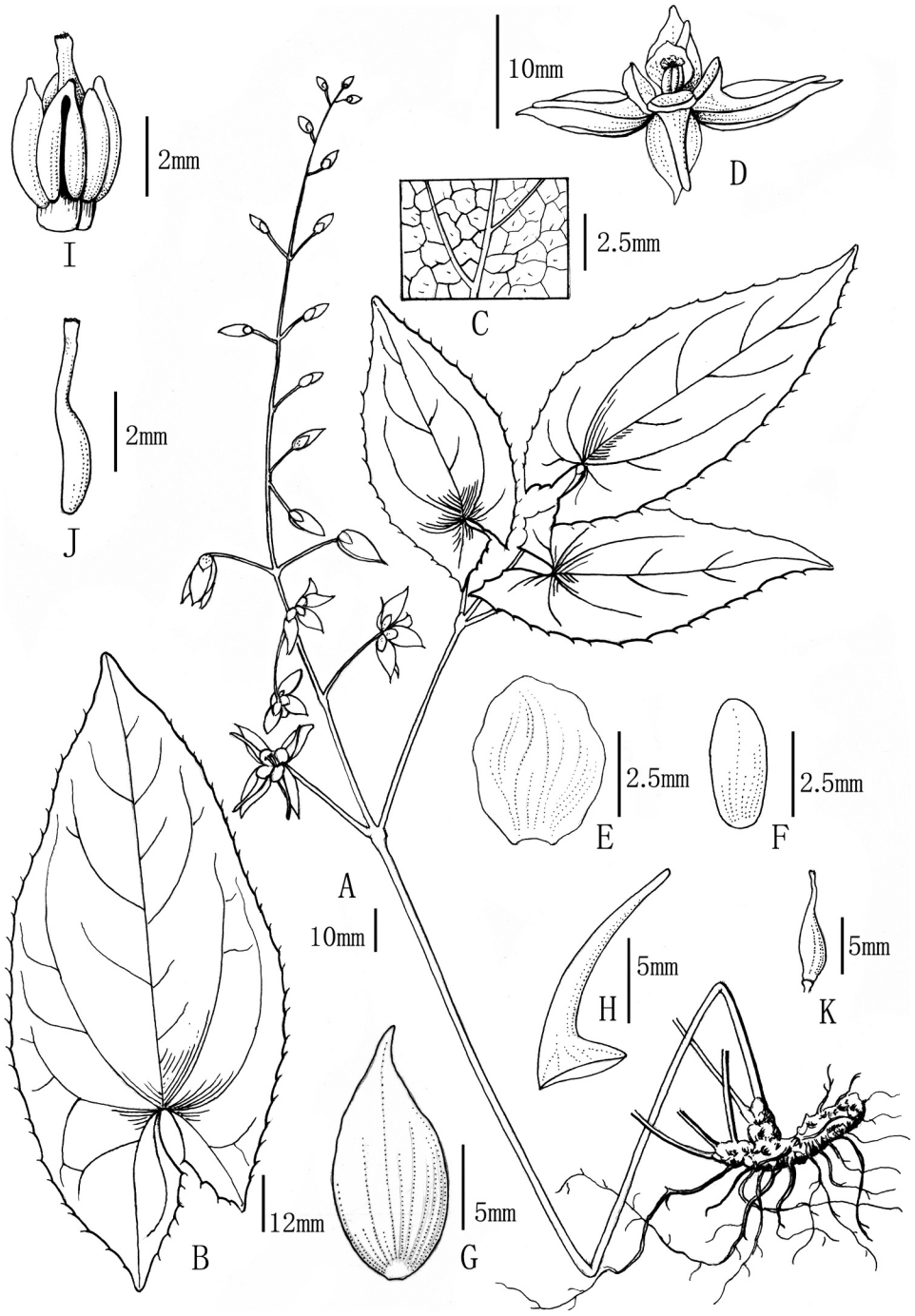

Figure 1. *Epimedium shennongjiaensis* Yan J. Zhang & J. Q. Li. —A. Habit. —B. Mature lateral leaflet. —C. Detail of abaxial leaf surface. —D. Flower. —E. Outer sepal, inner pair. —F. Outer sepal, outer pair. —G. Inner sepal. —H. Petal. —I. Stamens and gynoecium. —J. Gynoecium. —K. Fruit. Drawn by G. X. Chen from the holotype *Y. J. Zhang 148* (HIB).

based on corolla characteristics. *Epimedium shennongjiaensis* belongs to series *Davidianae* Stearn of section *Diphyllon*, which is characterized by large flowers and petals with expanded lamina and elongated spurs. Stearn (2002) ascribed 10 species to series *Davidianae*, differentiated mostly by rhizome morphology, leaflet number and morphology, and inflorescence and corolla characteristics. Recently,

Guo et al. (2007) reported *E. pseudowushanense* B. L. Guo and placed the new species in series *Davidianae*, bringing the total number of species in series *Davidianae* to 12.

Among the 12 species of series *Davidianae*, *Epimedium shennongjiaensis* presents greatest affinity with *E. epsteinii* from Hunan Province in their similar flower form. However, *E. shennongjiaensis* is distinguished by its compact rhizomes (vs. creeping and slender in *E. epsteinii*), narrowly ovate and acuminate inner sepals (vs. ovate and acute), and petals slightly shorter or nearly as long as the inner sepals with straight spurs (vs. petals a little longer than the inner sepals with slightly curved spur). In addition, *E. shennongjiaensis* has leaflets with the base deeply cordate and with a narrow sinus (vs. shallowly cordate with the lobes separated by moderately wide sinus) and the lobes of the terminal and lateral leaflets are acute (vs. rounded except for the larger lobes of lateral leaflets which are acute). In general, *E. shennongjiaensis* is a distinct species that can be distinguished from the other species of series *Davidianae* by its compact rhizome, leaflet number and morphology, simple inflorescence, flower color, and shape and size of inner sepal and petal.

KEY TO SPECIES OF *EPIMEDIUM* SER. *DAVIDIANAE*

1a. Leaflets 5, rarely 3.
  2a. Inner sepals reddish, ca. 4 × 1 mm; spur of petals much longer than inner sepals, 10–15 mm long . . . . . *E. davidii* Franchet
  2b. Inner sepals pale sulphur yellow, ca. 11 × 4 mm; spur of petals slightly longer than inner sepals, ca. 13 mm long . . . . . *E. flavum* Stearn
1b. Leaflets 3.
  3a. Inflorescences racemes.
    4a. Rhizome compact, 4.5–8 mm diam. . . . . *E. shennongjiaensis* Yan J. Zhang & J. Q. Li
    4b. Rhizome long-creeping, 1–3 mm diam.
      5a. Leaflets broadly ovate or almost orbicular, 1.3–2.5 × 1.2–2.5 cm . . . . . *E. pauciflorum* K. C. Yen
      5b. Leaflets ovate or narrowly ovate, 3–11 cm long.
        6a. Spur of petals much longer than inner sepals.
          7a. Inner sepals cymbiform, reddish, ca. 6 × 2.5 mm, apex obtuse; petals pale yellow . . . . . *E. fangii* Stearn
          7b. Inner sepals elliptic, white, ca. 16 × 8–9 mm, apex shortly acuminate; petals white . . . . . *E. latisepalum* Stearn
        6b. Spur of petals a little longer than inner sepals, or almost as long as inner sepals.
          8a. Inner sepals ovate, ca. 13 × 9 mm, apex acute; petals purple, spurs a little longer than inner sepals, 15–16 mm long. . . . . *E. epsteinii* Stearn
          8b. Inner sepals lanceolate, 16–19 × 7–9 mm, apex acuminate; petals white, spurs almost as long as inner sepals, 15–18 mm long . . . . . *E. ogisui* Stearn
  3b. Inflorescences panicles.
    9a. Petals with obvious basal lamina 7–8 mm high.
      10a. Leaflets narrowly ovate, 10–13 × ca. 6 mm, apex acuminate; inner sepals broadly elliptic, reddish, 5–6 × 3–4 mm . . . . . *E. hunanense* (Handel-Mazzetti) Handel-Mazzetti
      10b. Leaflets lanceolate, 5–7 × 1.2–3 mm, apex long acuminate; inner sepals elliptic or narrowly ovate, pale yellow, 10–12 × 5–6 mm. . . . . *E. ilicifolium* Stearn
    9b. Petals with slight basal lamina 2–3.5 mm high.
      11a. Inner sepals ovate or broadly ovate, 8–13 × 4–8 mm; spur of petals almost as long as or slightly longer than inner sepals, 10–15 mm long . . . . . *E. pseudowushanense* B. L. Guo
      11b. Inner sepals elliptic, 11–12 × 4–5.5 mm; spur of petals obviously longer than inner sepals, 17–20 mm long. . . . . *E. mikinorii* Stearn

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