



Paris qiliangiana (Melanthiaceae), a new species from Hubei, China

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Paris Linnaeus (1753: 367) comprises 28 species of perennial herbs, mainly distributed in eastern Asia (Osalo & Kawano 1999, Liang & Vitor 2000, Li *et al.* 2017, Ji *et al.* 2017, Wang *et al.* 2017). These species are also known as *chong-lou* in Chinese and are used as traditional medicines, the thick rhizome being used as analgesic, haemostatic, anticarcinogen, antineoplastic and anti-inflammatory (Wang *et al.* 2015, Li *et al.* 2015, 2017, Ji *et al.* 2017). This genus traditionally was placed in Liliaceae or Trilliaceae, which was divided into two genera based on floral merosity, namely *Trillium* Linnaeus (1753: 340) and *Paris* (Li 1984; Zomlefer 1997; Li 1998). *Paris* was revised recently by molecular phylogenetic approaches and placed in Melanthiaceae (Ji *et al.* 2006, APG IV 2016, Kim *et al.* 2016).

In May 2017, during a field investigation in the area around the Daba Mountains, we found in the local plantation areas an unusual *Paris* species with slanting sepals, linear, erect petals, an equal number of petals, sepals and stigmas, stamens in two whorls (twice the number of sepals), the free portion of the connective 0.1–0.2 cm long, yellowish green or purple, rounded at apex and the stylar base usually white, occasionally pale purple. It clearly differs from other species of this genus. After careful examination of specimens from KUN and consultation of the relevant literature (Li 1984, 1998, Zomlefer 1997, Ji *et al.* 2006, 2017, Li *et al.* 2017, Wang *et al.* 2017), we concluded it did not match morphologically any of the existing species. We here describe it as a new species.

Paris qiliangiana H.Li, J.Yang & Y.H.Wang, *sp. nov.* (Fig. 1)

Type:—CHINA. Hubei Province: Daping Village, Fengxi Township, Zhuxi County, in plantation areas under the forest, 31° 55' N, 109° 40' E, elev. 1004 m, in flower, 6 May, 2017, Li & Yang 053-03, (holotype: KUN!; isotype: KUN!).

The new species differs from *P. delavayi* Franchet (1898: 190) by its slanting sepals; erect, linear petals as long as or slightly shorter than the sepals, usually equal to the number of sepals and stigmas; stamens in two whorls, two times the number of sepals, free portion of connective 1–2 mm long, yellowish green or purple, rounded at apex; stylar base usually white, occasionally pale purple.

Erect, glabrous, perennial herbs. Rhizome thickened, cylindrical, oblique or horizontal, yellowish brown outside, white and starchy inside, 3.0–8.0 cm long, 0.8–2.0 cm in diameter, fibrous roots borne on the three or four new nodes. Stems 1 or 2, green or purplish red, 18.0–62.0 cm, 0.3–0.5 cm thick, surrounded by three 1.0–2.0 cm long dark membranous scales at base, the scales leaving three inconspicuous scars on the rhizome when they wither. Leaves (4–)5–6(–7)–8 in a terminal whorl; petioles green or dark purple, 0.8–4.0 × 0.1–0.3 cm; leaf blades ovate, obovate or oblanceolate, 7.0–13.0 × 3.5–6.0 cm, green adaxially, pale green abaxially, apex acuminate, base subrounded, subcordate or cuneate; major veins 3–5, obvious, nearly basal, depressed adaxially and prominent abaxially, conspicuously net-veined. Flower solitary, terminal; pedicel 7.5–24.0 cm long and 0.2–0.4 cm thick, green or purplish red; sepals (3–)4–5(–6), green adaxially, pale green abaxially, ovate or lanceolate, 4.0–8.0 × 1.5–3.5 cm, base cuneate or rounded, apex acuminate, persistent; petals (3–)4–5(–6), usually equal to the number of sepals and stigmas, linear, 3.0–6.0 × 0.1 cm wide, as long as or slightly shorter than sepals, persistent, erect, light green in the lower 3/4 of its length, yellowish green or purple–black, slightly widening in the upper 1/3; stamens (6–)8–10(–12), in two whorls, usually equal to twice the number of sepals, 1.8–2.5 cm long, filaments yellow-green, 0.3–0.5 cm long, anthers yellow, 1.0–2.0 cm long, free portion of connective only 0.1–0.2 cm long, yellowish green or purple, rounded at apex; ovary ovoid, green, with (3–)4–5(–6) longitudinal ridges, carpels (3–)4–5(–6), rarely 2 (Li & Yang 053-1), unilocular with parietal placenta, ovate anatropous ovules, white, transparent, numerous, on two longitudinal rows along every placenta; stylar base usually white, occasionally pale purple, inflated and forming a pyramid over the top of ovary, style ca. 0.2–0.6 cm, pale yellow to orange; stigmas (3–)4–5(–6), rarely 2 (Li & Yang 053-1), free, ca. 0.1–0.3 cm long,

light yellow to purple, revolute at flowering. Capsule yellowish green at maturity, spheroidal, with (3–)4–5(–6) longitudinal ridges, 2.0–3.0 cm in diameter, irregularly dehiscent between ridges. Seeds subglobose, ca. 0.3 cm in diameter, white, wholly enveloped by a red, succulent testa.

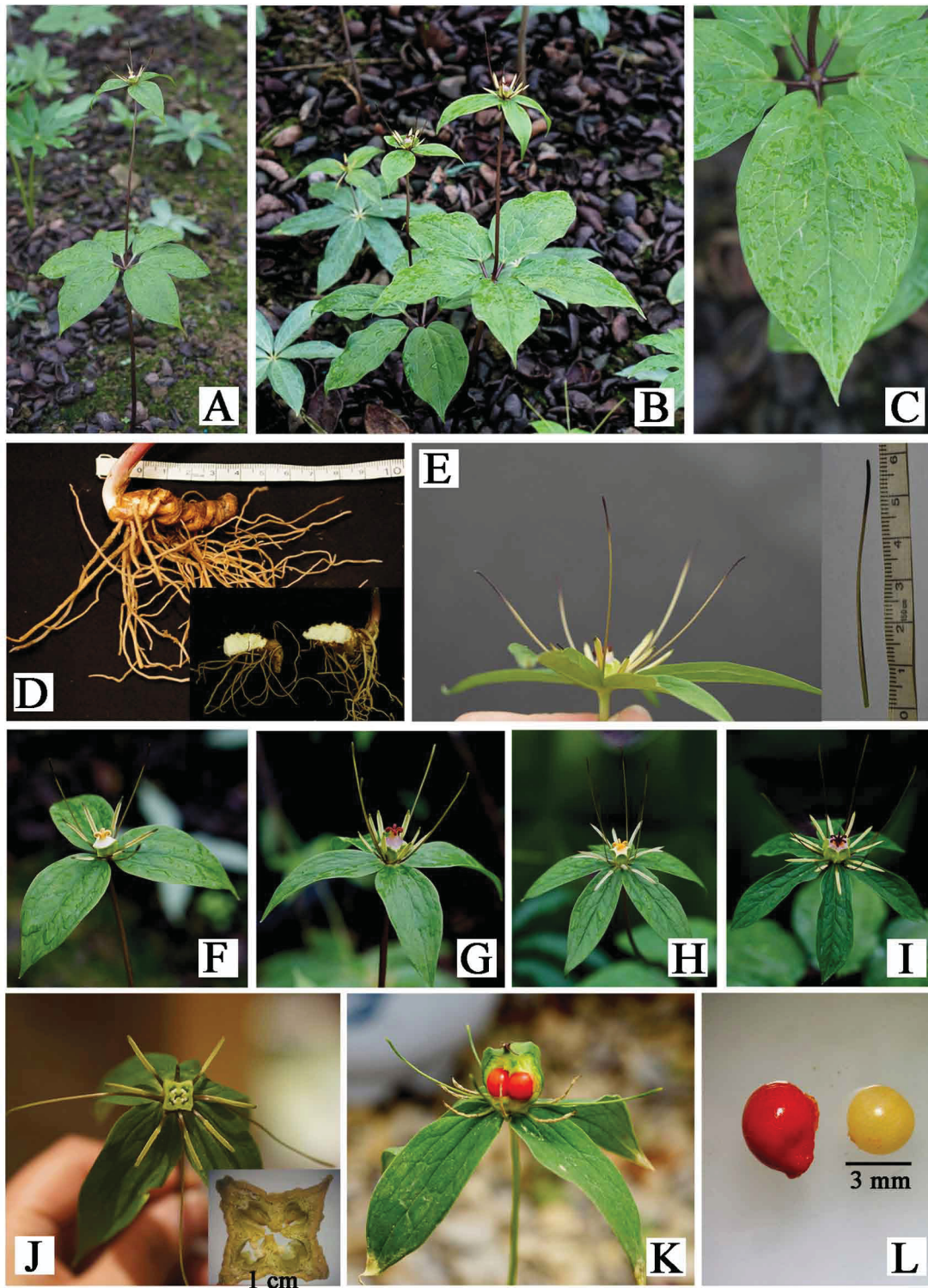


FIGURE 1. *Paris qiliangiana* H.Li, J.Yang & Y.H.Wang. A–B. Habit. C. Leaves adaxial surface. D. Rhizome (outside and inside) and roots. E. A flower showing the characters of the petals. F–I. Flowers with (3–)4–5(–6)-merous petals, stigmas equal to the number of sepals, stamens (6–)8–10(–12), in two whorls, equal to two times the number of sepals and showing the color of the styler base white or pale purple. J. Transverse section of ovary showing parietal placentas and white ovules. K. A dehiscent capsule with red seeds. L. A red-arrillate seed and a seed with the fleshy juicy testa removed showing white tegumen.

Distribution:—The new species is known only from Daping Village, Fengxi Township, Zhuxi County, western Hubei Province. Our investigations in the Daba mountainous areas bordering on Shangxi Province and Chongqing Municipality, Zhuxi County, Shengnongjia County, Shiyan City and Enshi County Hubei Province, and Chengkou County, Chongqing Municipality found some individuals of this species cultivated by local farmers, who announced that these plants were collected from the mountains around there, but the exact localities were unknown. It is possible that *Paris qiliangensis* has a relatively wide distribution in western China, and more explorations are needed.

Ecology:—*Paris qiliangiana* grows under subtropical evergreen forests at 720–1140 m.

Phenology:—Flowering March–May and fruiting September–October.

Etymology:—The specific epithetic is in honour of Qi-Liang Gan, in appreciation of his excellent contribution to the study of plants in Zhuxi, Hubei Province.

Taxonomic relationships:—The species is morphologically similar to *P. delavayi* in leaf shape and texture (Li 1984, 1998, Zomlefer 1997, Ji *et al.* 2006, 2017, Li *et al.* 2017, Wang *et al.* 2017). However, *P. qiliangiana* clearly differs in several characteristics (Table 1).

Additional specimens examined:—CHINA. Hubei Province: Daping Village, Fengxi Township, Zhuxi County, 31° 55' N, 109° 40' E, elev. 1004 m, 6 May, 2017, *Li & Yang 053-01, 053-02, 053-04, 053-05, 053-06, 053-07* (KUN); Songbai Township, Shengnongjia County, 31° 44' N, 110° 39' E, elev. 931 m, 7 May 2017, *Li & Yang 053-013* (KUN); Shiyan County, elev. 720 m, 8 May 2017, *Li & Luo 053-014, 053-015* (KUN); Xingtian Village, Bangqiao Township, Enshi County, 30° 31' N, 109° 11' E, elev. 1759 m, 13 May 2017, *Wang wz-0710* (HNNU).

TABLE 1. Morphological comparisons between *Paris qiliangiana* and *P. delavayi*.

Character	<i>Paris qiliangiana</i>	<i>P. delavayi</i>
Sepals	slanting, 4.0–8.0 × 1.5–3.5 cm	recurved, 4.0–9.0 × 2–4 cm
Petals	erect, 3.0–6.0 cm long, as long as sepals	pendent under sepals, 0.5–1.5 cm long, obviously shorter than sepals
Stamens	anthers yellow, only 1.0–2.0 cm long, free portion of connective 0.1–0.2 cm long	anthers purple, 0.6–1.8 cm long, free portion of connective 0.7–0.8 cm long,
Pistil	stylar base usually white	stylar base purple

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