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## A New Species of *Triaenophora* (Scrophulariaceae) from China

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**ABSTRACT.** A new species of *Triaenophora* Solereder, *T. shennongjiaensis* X. D. Li, Y. Y. Zan & J. Q. Li (Scrophulariaceae), is described and illustrated from Shennongjia National Natural Reserve, Hubei Province, China. The new species is related to *T. rupestris* (Hemsley) Solereder, from which it differs in having densely glandular leaves, dentate bract margins, and pale yellow petals that are retuse or rarely obtuse at their apices.

**Key words:** China, Scrophulariaceae, *Triaenophora*.

*Triaenophora* Solereder (Scrophulariaceae) was separated from the genus *Rehmannia* Liboschitz ex Fischer & C. A. Meyer, on the basis of its three-lobed calyx (Solereder, 1909). *Triaenophora* is distributed in western and northwestern Hubei and Chongqing in China, with only two species, *T. rupestris* (Hemsley) Solereder in Hubei and *T. integra* (Li) Ivanina in Chongqing (Forbes & Hemsley, 1890; Li, 1948; Ivanina, 1955; Chin, 1979). These two species are similar in general appearance, but the latter species has smaller leaves, which are rounded at the tip and entire instead of acute and serrate.

The new species was collected from the Panlong cavern, Shennongjia National Natural Reserve, Hubei, China. It appears most closely related to *T. rupestris* (Hemsley) Solereder, but differs from it in having densely glandular leaves, dentate bract margins, and pale yellow petals that are retuse or rarely obtuse apically.

***Triaenophora shennongjiaensis*** X. D. Li, Y. Y. Zan & J. Q. Li, sp. nov. TYPE: China. Hubei: Shennongjia Nat. Nat. Res., Panlong cavern, 110°27'58"E, 31°24'41"N, 8 Aug. 2003, Yanyan Zan 238 (holotype, HIB). Figure 1.

Species *T. rupestris* Solereder affinis, sed foliis utrinque dense glandulosis vel laxe pilosis, bracteis margine dentatis, corollas luteolis, apice retusis vel raro rotundatis differt.

Perennial herbs, 10–60 cm tall, leaves and stems with sparse non-glandular and dense glandular hairs; roots pale yellow, fleshy, brittle; stem very short; leaves in a basal rosette, oblong to elliptic, 8–20 × 5–10 cm, densely glandular or pilose on both surfaces, base subcordate to cuneate, margins dentate, apex obtuse; petioles 3–6 cm long. Inflorescence racemose, main raceme suberect, lateral racemes prostrate, bracts in lower parts resembling basal leaves, 20–50 cm long, compact, 12- to 54-flowered; bracts similar to leaves but smaller, oblong, margins dentate; pedicels 5–25 mm long; bracteoles 2 at middle of pedicels, linear, opposite, 3–20 mm long. Flower with calyx cylindrical, tube 5–8 mm long, erect, 5-lobed with each lobe 3-toothed, the teeth linear, irregularly acuminate, 6–12 mm long; corolla pale yellow, 4–6.5 cm long, pilose abaxially, glabrous adaxially, corolla tube elongate, erect or slightly curved, 3–4.5 cm long, 1–1.5 cm diam., often with purplish red spots and glands within the throat, corolla 2-lipped, lobes with apices obtuse or rarely retuse, superior lobe separated by deeper sinuses, narrower, 2-toothed, 8–15 × 6–10 mm, inferior lobes 3-toothed, 8–15 × 4–8 mm; stamens 4, included, anthers 2–3 mm long; ovary ovoid, glabrous, ca. 3.5 cm long, styles included, stigma bifid. Capsules oblong, 8–15 × 8 mm; seeds numerous, minute, ca. 1 × 0.5 mm, oblong, laevigate.

**Distribution.** China, Hubei Province, Shennongjia National Natural Reserve and elsewhere, including Badong and Xingshan counties (see paratypes); 700 to 1200 m. The distribution of this new species indicates that it is rare. Only 6 populations containing a total of about 600 to 700 individuals were found in Shennongjia and neighboring mountains. The type population consists of only about 100 individuals in nearly inaccessible sites on the limestone cliff near Panlong cavern. *Triaenophora shennongjiaensis* is an endangered species that is



Figure 1. *Triaenophora shennongjiaensis* X. D. Li, Y. Y. Zan & J. Q. Li. —A. Habit. —B. Longitudinal section of flower. —C. Calyx, showing teeth. —D. Corolla. Drawn by G. X. Chen.

endemic to the limestone habitats. Intensive searches to locate additional native populations as well as strict conservation measures to safeguard the known populations are urgently needed. *Triaenophora shennongjiaensis* and *T. rupestris* have allopatric distributions: the former in Shennongjia National Natural Reserve, Badong, Xingshan, and Baokang; and the latter in Lichuan, Zhuxi, and

Fang counties of Hubei and Wuxi, Wulong, Wushan, and Chengkou counties of Chongqing.

*Phenology.* Flowering late June to mid October.

Both species have been cultivated in Wuhan Botanical Garden for one year, from July 2003 to July 2004. *Triaenophora shennongjiaensis* flowers in early May, whereas *T. rupestris* flowers in mid June.

The diagnostic characters of both species, namely, the morphology of the bracts, the floral morphology, the color of the petals, and the pubescence, are basically stable and show no differences between cultivated and native specimens.

*Paratypes.* CHINA. **Hubei:** Badong County, Yutougou village, 20 Aug. 2003, *Xiaodong Li 0122* (HIB); Baokang County, 38.5 km along road from Maqiao to Xiema, 31 July 2003, *Xiaodong Li 0138* (HIB); 12 Aug. 2004, *Xiaodong Li 0158* (HIB); Xingshan County, Xiangping village, 16 July 2003, *Xiaodong Li 0131* (HIB).

KEY TO THE SPECIES OF *TRIAENOPHORA*

- 1a. Leaves bigger, tip acute, and margin serrate.
  - 2a. Bract margins entire; corolla purple-red, apices obtuse . . . . . 1. *T. rupestris*
  - 2b. Bract margins dentate; corolla pale yellow, apices retuse or rarely obtuse . . . . . 2. *T. shennongjiaensis*
- 1b. Leaves relatively smaller, tip rounded, and margin entire . . . . . 3. *T. integra*

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