



## *Cremanthodium wumengshanicum* (Asteraceae, Senecioneae), a new species from Yunnan, China

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### Abstract

A new species, *Cremanthodium wumengshanicum*, is described and illustrated. It is most readily distinguishable in the genus by having 10–14 bracts subtending the head. Morphological differences between *C. wumengshanicum* and its putative closest allies and a distributional map of the new species are presented.

**Key words:** Compositae, taxonomy

### Introduction

*Cremanthodium* Benth (1873: 37) (Asteraceae, Senecioneae) is a typical alpine genus distributed in the Sino-Himalayan region, with ca. 70 species being recognized (Liu & Illarionova 2011). All the species occur in China, 46 of which are endemic to the country (Liu & Illarionova 2011).

During a botanical expedition to southwestern China in 2015, we found an unusual population of *Cremanthodium* on Jiaozi Xue Shan, Luquan county, northeastern Yunnan province. In general aspect the plants are similar to *C. decaisnei* Clarke (1876: 168) and *C. reniforme* (Candolle 1838: 315) Benth (1873: 37), but differ from them immediately by, among other characters, having 10–14 bracts subtending the head. A survey of the major Chinese herbaria resulted in the discovery of several previous collections (*E. D. Liu et al. 2215*, *H. Peng et al. 8661, 9016*, all in KUN, and *Y. S. Chen 9006*, *S. B. Lan 559*, both in PE) from northeastern Yunnan, which are identical with the above-mentioned population but had been variously misidentified as *C. principis* (Franchet 1896: 412) Good (1929: 283), *C. reniforme*, or *C. thomsonii* Clarke (1876: 169). On the basis of our observations of such significant herbarium materials and living plants in the wild, we determined that the plants in question represent a hitherto undescribed species, which we describe below.

*Cremanthodium wumengshanicum* L. Wang, C. Ren & Q.E. Yang, **sp. nov.** (Figs. 1, 2 & 3)

**Type:**—CHINA. Yunnan, Luquan, Jiaozi Xue Shan, 26°05'01.39''N, 102°51'48.27''E, 4100 m, 16 July 2015, *M. Tang, L. Wang & T. J. Tong 1299* (holotype IBSC; isotypes IBSC).

Perennial herbs with very short rhizome. Roots fleshy, ca. 2 mm in diameter. Stems solitary or 2, erect, 20–40 cm tall, 3–4 mm in diameter, proximally glabrous, distally densely purplish brown pilose. Basal leaves petiolate; petiole 4–10 cm long, slender, glabrous, base sheathed; leaf blade reniform or orbicular-reniform, 2–7 cm long, 3–12 cm broad, thick, adaxially bright green and glabrous, abaxially pale green, palmate veins prominent, veins purplish brown pilose, margin angular-dentate, base cordate, apex rounded. Stem leaves 1 or 2; middle leaves smaller than basal leaves, reniform, base sheathed, shortly petiolate or sessile; distal leaves bracteal, oblong. Capitula solitary, nodding. Involucre campanulate, 1–2 cm long, 1.5–2.5 cm broad, outside brown pilose; phyllaries papery, 12–15, in 2 rows;

outer phyllaries lanceolate, apex acuminate or caudate; inner phyllaries oblong, margin membranous, apex acuminate; bracts 10–14, oblong or narrowly ovate, 3–5 mm long, 2–3 mm broad, apex acuminate. Ray florets yellow; lamina lanceolate, 1–5 cm long, 4–7 mm broad, apex acute or acuminate, usually 3-denticulate. Tubular florets numerous, yellow, 1 cm long; tube 3 mm long; limb campanulate. Achenes brown, oblong, 3 mm long, 6–10-ribbed. Pappus white or sometimes purplish brown, 6–8 mm long, as long as or slightly shorter than tubular corolla.



FIGURE 1. Holotype sheet of *Cremanthodium wumengshanicum*.



**FIGURE 2.** *Cremanthodium wumengshanicum* in the wild (Jiaozi Xue Shan, Luquan, Yunnan, China). **A.** Habitat. **B.** Habit. Photos by L. Wang.

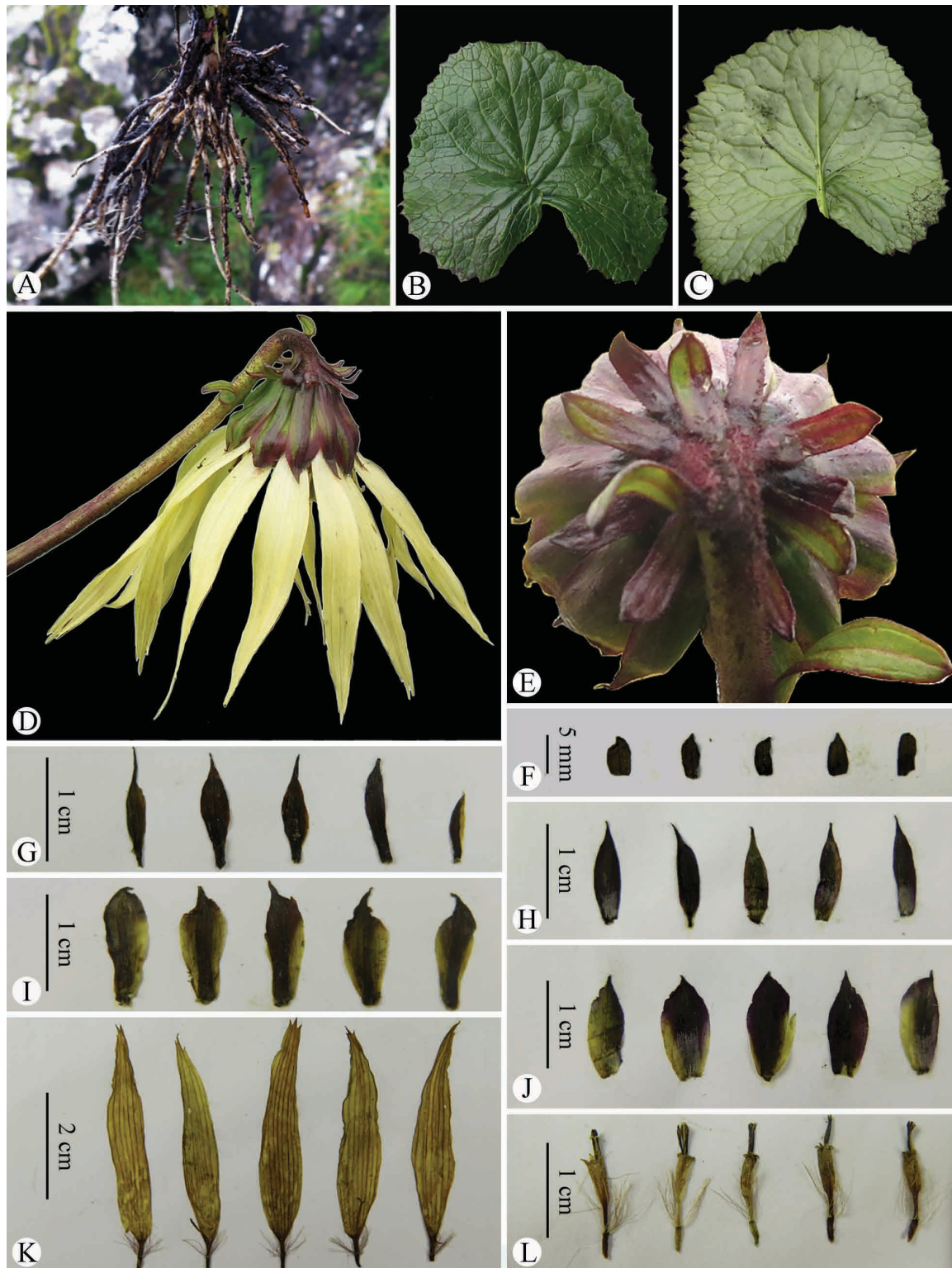
**Distribution and Habitat:**—*Cremanthodium wumengshanicum* is currently known from northeastern Yunnan (Dongchuan, Luquan), China (Fig. 4). It grows in alpine meadows or cliff crevices between 3500 and 4300 m above sea level.

**Phenology:**—Flowering July–August; fruiting August–September.

**Etymology:**—The specific epithet is derived from Wumeng Shan in southwestern China, with Jiaozi Xue Shan, the type locality of the species, being one of its highest peaks.

**Additional specimens examined:**—CHINA. Yunnan, Dongchuan, alpine meadow, 3900–4000 m, 18 July 2009, *Y. S. Chen 9006* (PE); Yunnan, Dongchuan, alpine meadow, 4300 m, 25 August 1985, *S. B. Lan 559* (PE); Yunnan, Dongchuan, alpine meadow, 4200 m, 28 July 2008, *H. Peng et al. 8661* (KUN); Yunnan, Dongchuan, alpine meadow, 3500 m, 31 July 2008, *H. Peng et al. 9016* (KUN); Yunnan, Luquan, cliff crevices, 3920 m, 8 August 2009, *E. D. Liu et al. 2215* (KUN); Yunnan, Luquan, cliff crevices, 4050 m, 15 September 2013, *M. Tang & C. Ren 781* (IBSC).

**Discussion:**—*Cremanthodium wumengshanicum* is somewhat similar to *C. reniforme* in the leaf shape and head size, but more or less differs in the size and indumentum of leaves, number and indumentum of phyllaries, and shape and size of the ray lamina. It also resembles *C. decaisnei* in leaf shape, indumentum of phyllaries, and shape of the ray lamina, but differs in size and indumentum of leaves, number of phyllaries, and shape and size of the ray lamina. In particular, *C. wumengshanicum* is most readily distinguishable from both *C. reniforme* and *C. decaisnei* in the presence of 10–14 bracts subtending the head. The morphological differences between the three species are detailed in Table 1. It is worth noting that the presence of numerous bracts in *C. wumengshanicum* is a unique character in the whole *Cremanthodium*. Interestingly, in *Ligularia* Cassini (1816: 198), a genus closest to *Cremanthodium*, *L. pyrifolia* Liu (1985: 68) also has numerous (to 15) bracts (Liu & Illarionova 2011). *Ligularia pyrifolia* is a very distinctive species distributed in southwestern Yunnan (Jingdong), China.



**FIGURE 3.** *Cremanthodium wumengshanicum* in the wild (Jiaozi Xue Shan, Luquan, Yunnan, China). **A.** Rhizome and roots. **B.** Leaf blade (adaxial surface). **C.** Leaf blade (abaxial surface). **D.** Capitulum (side view). **E.** Capitulum (back view). **F.** Bracts. **G.** Outer phyllaries (abaxial surface). **H.** Outer phyllaries (adaxial surface). **I.** Inner phyllaries (abaxial surface). **J.** Inner phyllaries (adaxial surface). **K.** Ray florets. **L.** Tubular florets. Photos by L. Wang.

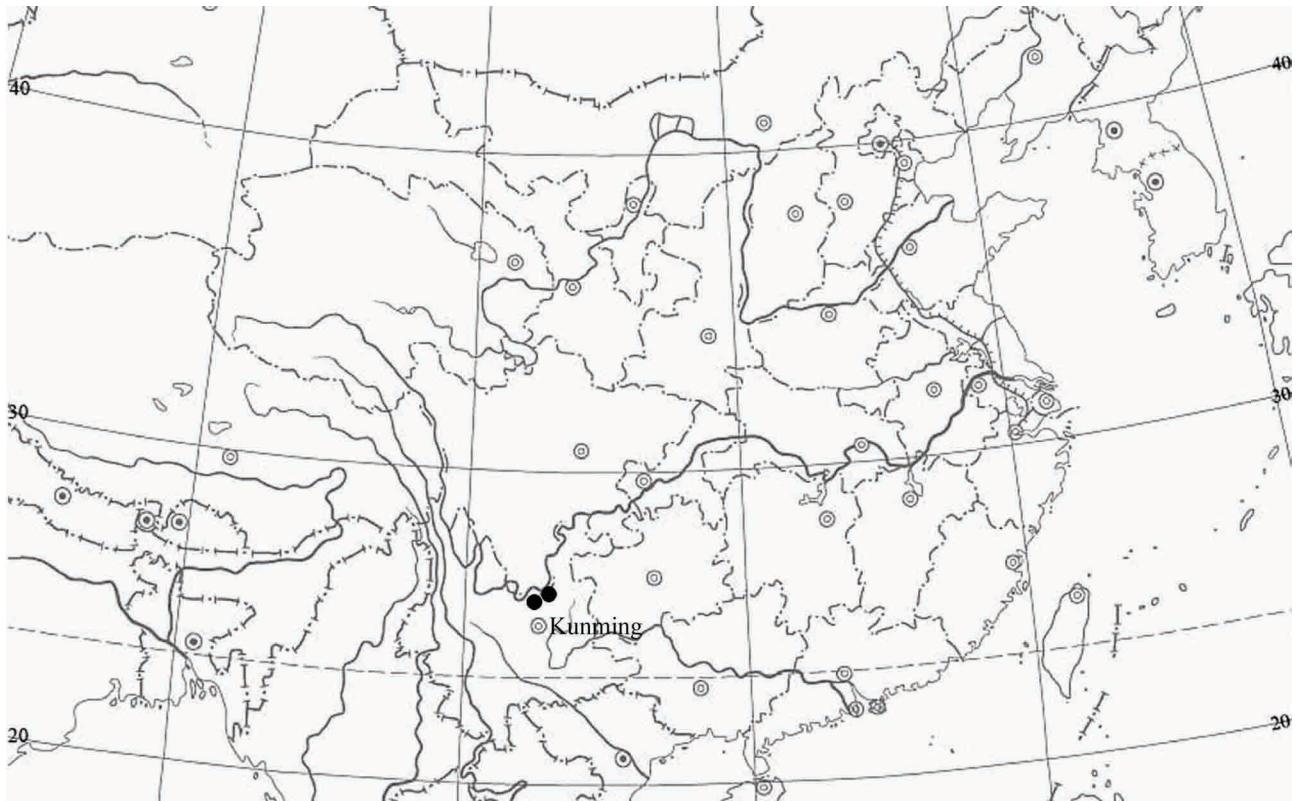


FIGURE 4. Distribution of *Cremanthodium wumengshanicum* (●).

TABLE 1. Morphological differences between *Cremanthodium decaisnei*, *C. reniforme*, and *C. wumengshanicum*.

	<i>C. decaisnei</i>	<i>C. reniforme</i>	<i>C. wumengshanicum</i>
Leaf size	0.5–4.5 × 0.9–5 cm	2–3.5 × 2.5–7 cm	2–7 × 3–12 cm
Leaf indumentum	densely brown pilose abaxially, glabrous adaxially	glabrous on both surfaces	purplish brown pilose abaxially, particularly so on veins, glabrous adaxially
Number of phyllaries	8–12	10–12	12–15
Indumentum of phyllaries	brown pilose outside	black glandular pilose outside	brown pilose outside
Bracts	absent	0–1, linear	10–14, oblong or narrowly ovate
Shape of ray lamina	narrowly elliptic or oblong	oblanceolate	lanceolate
Size of ray lamina	1–2 cm × 3–6 mm	1.5–2 cm × 4–8 mm	1–5 cm × 4–7 mm

On the basis of morphological characters, Liu (1982, 1989) divided the genus *Cremanthodium* into three sections and seven series. Regrettably this classification has not as yet been tested by any molecular phylogenetic analysis. *Cremanthodium wumengshanicum* can be referred to *C. sect. Cremanthodium ser. Decaisneana* Ling & S. W. Liu by having reniform leaves with palmate veins, phyllaries papery, apex usually acuminate, and ray lamina oblong or lanceolate, apex acute or acuminate.

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