



Cremanthodium liangshanicum (Asteraceae, Senecioneae), a new species from southwestern Sichuan, China

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Abstract

Cremanthodium liangshanicum (Asteraceae, Senecioneae), a new species from the Liangshan Mountains region in southwestern Sichuan, China, is illustrated and described. The new species is similar to *C. potaninii* and *C. cyclaminanthum* in habit and the relatively smaller leaves, but differs from both of them in the stem pubescence and the shape of the basal leaves. From the former it can be distinguished additionally by the phyllary indumentum, and particularly, by the shape and length of the ray laminae. From the latter it is distinct also in the shape of the involucre and the length of the pappus.

Key words: Compositae, Liangshan Mountains region, taxonomy

Introduction

In the course of checking specimens for the preparation of an account of the genus *Cremanthodium* Benth (1873: 38) for the *Flora of Pan-Himalaya* (www.flph.prg/index), three collections, *T.T. Yu 1313* (PE), *Sichuan Veg. Exped. 12907* (CDBI, PE, SWU) and *Z.X. Tang et al. 154* (PE), all from the Liangshan Mountains region in southwestern Sichuan, China, caught our attention. These specimens had been previously identified as *C. cyclaminanthum* Handel-Mazzetti (1925: 14), but they certainly do not belong to that species because of, among other characters, the campanulate (vs. hemispheric) capitula. In July 2016, we made a botanical trip to Zhaojue in the Liangshan Mountains region and successfully discovered a population of the plants in question. Upon careful observations we found they are somewhat similar to both *C. cyclaminanthum* and *C. potaninii* Winkler (1895: 150; “*potanini*”) in habit and the relatively smaller leaves, but they can be distinguished from the two species by an array of morphological characters. We therefore determined that they represent a hitherto undescribed species, which we describe below.

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

Type:—CHINA. Sichuan, Zhaojue, Qiliba, 27°52'44.83" N, 102°33'02.74" E, alpine meadows, 3136 m, 14 July 2016, *L. Wang & Y.P. Zeng 832* (holotype IBSC; isotypes CDBI, PE).

Perennial herbs. Stem solitary, erect, 20–30 cm tall, 1–2 mm in diam. at base, slender, glabrous proximally, sparsely purplish-black pilose and slightly white arachnoid distally. Basal leaves 3–8, petiolate; petiole 1–10 cm long, slender, glabrous, base slightly sheathed; leaf blade ovate or ovate-oblong, 1–3 cm long, 0.8–1.5 cm broad, bright green adaxially, pale green abaxially, glabrous on both surfaces, base rounded, obliquely cuneate, rarely very shallowly cordate, apex obtuse, margin shallowly crenate; pinnate veins slightly sunken adaxially, prominent abaxially. Stem leaves 1–4, proximal stem leaf 1, leaf-like, shortly petiolate, smaller than basal leaves, base slightly sheathed, middle to distal stem leaves absent or 1–3, bracteal, sessile, oblanceolate-ovate or oblanceolate to linear, margin entire. Capitula solitary. Involucre campanulate, ca. 1 cm high, 1.2–2 cm in diam., glabrous outside or slightly brown pilose on the lower part; phyllaries 8–10, in nearly 2 rows; outer ones lanceolate, 1–1.5 mm wide, apex acuminate; inner ones

narrowly oblong, 2.5–3 mm wide, margin membranous, apex acuminate, shortly white ciliate on upper edges. Ray florets 7–10, yellow, lamina oblong, 1–1.3 cm long, 4–5 mm wide, apex acute, sometimes shallowly 3-dentate; tube ca. 2.5 mm long. Tubular florets 8–13, yellow; limb campanulate, ca. 3.5 mm long, tube ca. 2.5 mm long. Achenes cylindrical, 2–3 mm long, conspicuously ribbed. Pappus whitish or brownish, as long as tubular corolla.



FIGURE 1. Holotype sheet of *Cremanthodium liangshanicum*.

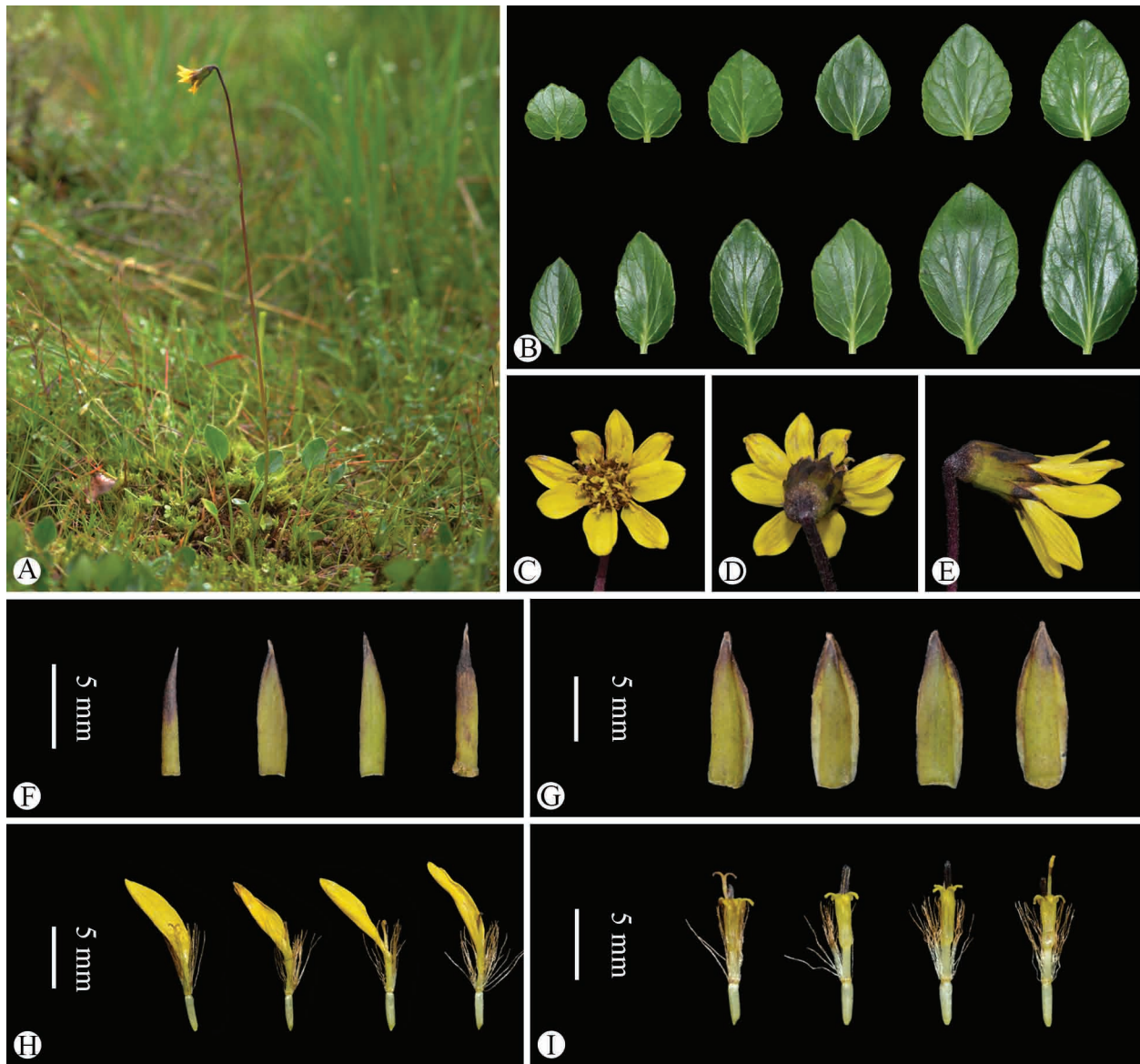


FIGURE 2. *Cremanthodium liangshanicum* in the wild (Zhaojue, Sichuan, China). **A.** Habitat and habit. **B.** Basal leaves. **C.** Capitulum (top view). **D.** Capitulum (back view). **E.** Capitulum (side view). **F.** Outer phyllaries (abaxial surface). **G.** Inner phyllaries (abaxial surface). **H.** Ray florets. **I.** Tubular florets.

Distribution and Habitat:—*Cremanthodium liangshanicum* is currently known only from Xichang and Zhaojue in the Liangshan Mountains region, southwestern Sichuan, China (Fig. 3). It grows in alpine meadows or among alpine scrub at elevations of 2900–3450 m above sea level. The distribution of this species is rather peripheral, nearly on the southeastern margin of the range of the whole genus. It is one of the few *Cremanthodium* species that can grow at relatively lower elevations below 3000 m.

Phenology:—*Cremanthodium liangshanicum* is a somewhat earlier-flowered species in the genus, flowering in middle June to early July and fruiting in middle July to early August.

Etymology:—The specific epithet is derived from the Liangshan Mountains region, southwestern Sichuan, China, where the type locality of this species, Zhaojue, is situated.

Additional specimens examined:—CHINA. Sichuan, Xichang, alpine meadows, 2900–3100 m, 10 August 1932, *T.T. Yu 1313* (PE); Zhaojue, Jiefang, alpine meadows, 3200 m, 9 July 1976, *Sichuan Veg. Exped. 12907* (CDBI, PE, SWU); Zhaojue, Nidi, alpine meadows among scrub, 3450 m, 24 June 1987, *Z.X. Tang et al. 154* (PE).

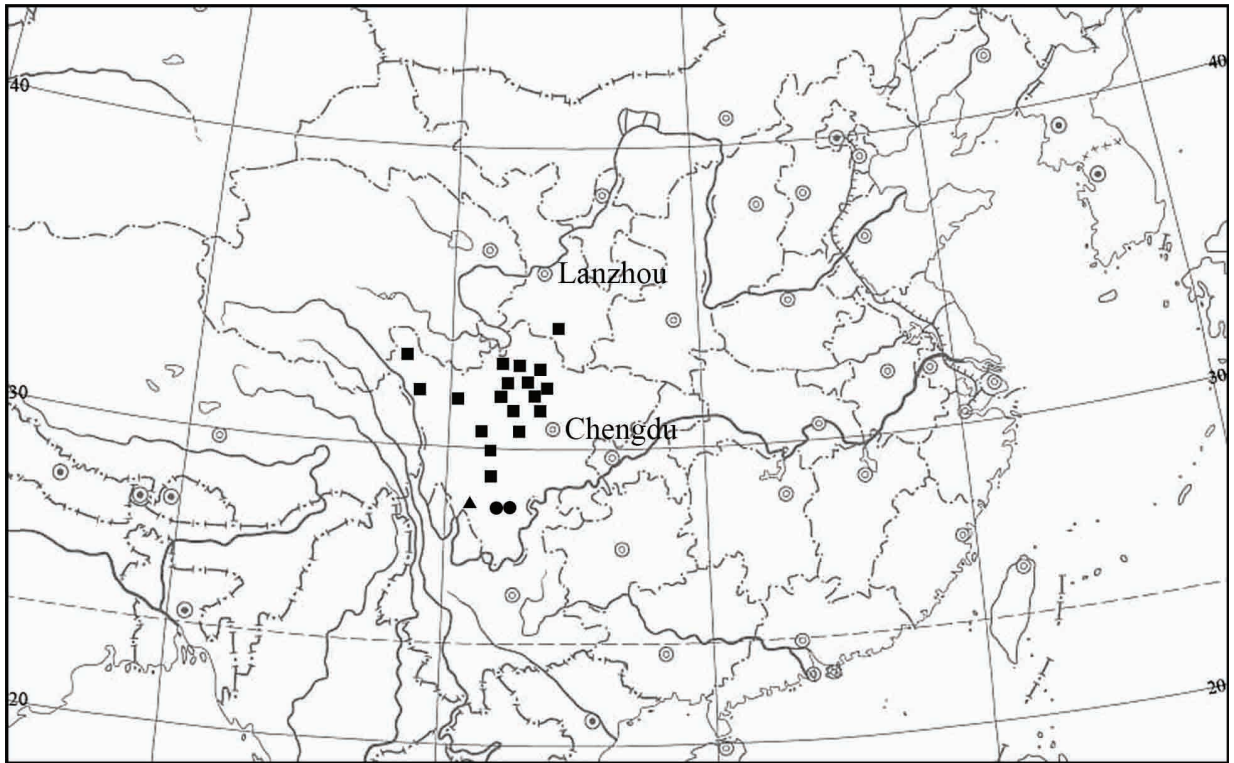


FIGURE 3. Distribution of *Cremanthodium cyclaminanthum* (▲), *C. liangshanicum* (●), and *C. potaninii* (■).

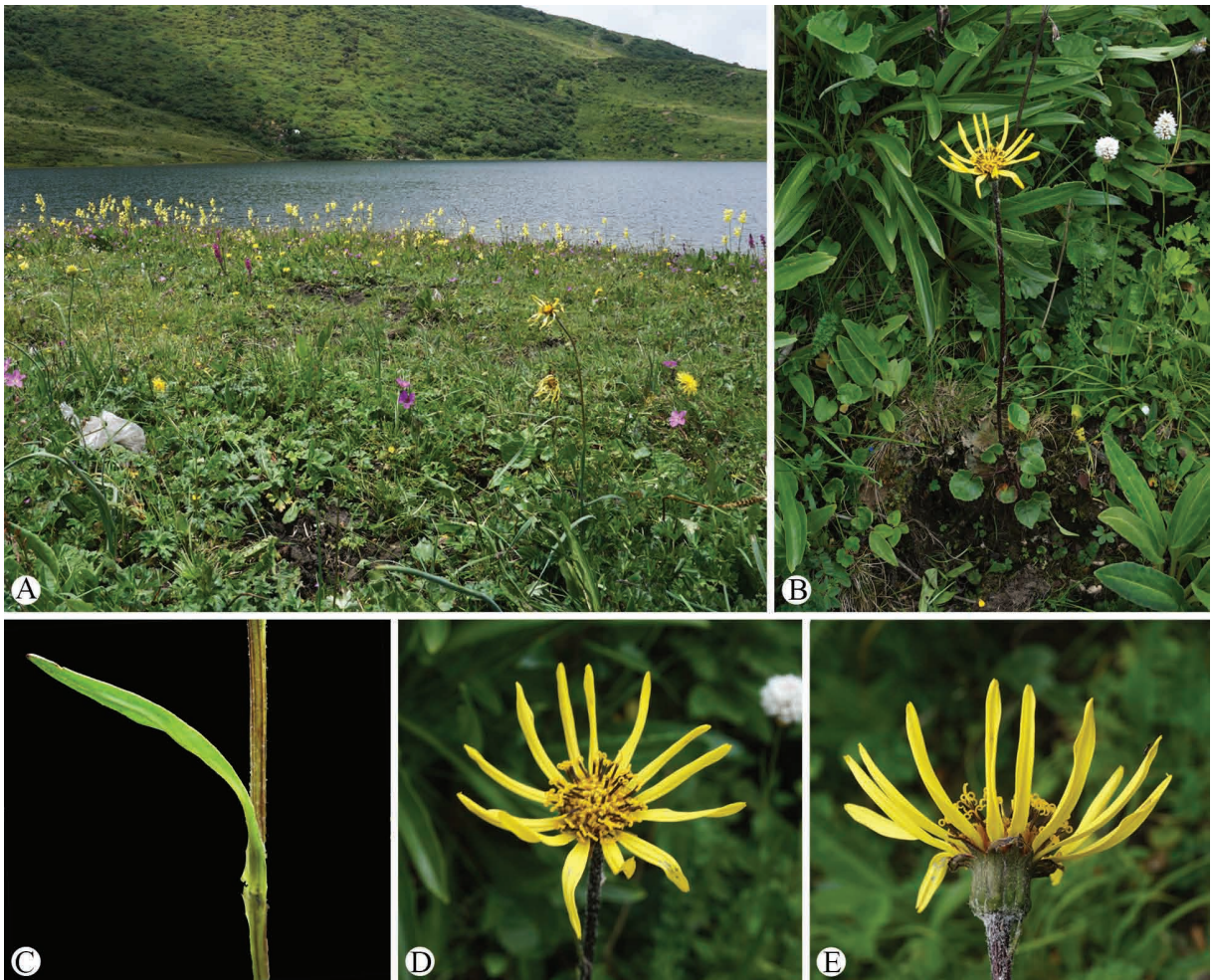


FIGURE 4. *Cremanthodium potaninii* in the wild (Maoxian, Sichuan, China). A. Habitat. B. Habit. C. Stem leaf. D. Capitulum (top view). E. Capitulum (side view).

Discussion:—*Cremanthodium liangshanicum* is similar to both *C. potaninii* (Figs. 4, 5) and *C. cyclaminanthum* (Fig. 6) in habit and the relatively smaller leaves. It is distinguishable from *C. potaninii* by the sparsely purplish-black pilose and slightly white arachnoid (vs. densely white arachnoid) stem, ovate or ovate-oblong (vs. ovate-cordate, ovate-triangular or ovate-lanceolate) basal leaves, sparsely brown pilose or glabrous (vs. white arachnoid) phyllaries, and oblong (vs. narrowly linear), shorter (1–1.3 vs. 1.5–3.5 cm) ray laminae. From *C. cyclaminanthum* it is different in the sparsely purplish-black pilose and slightly white arachnoid (vs. brown velvety pilose) stem, ovate or ovate-oblong (vs. suborbicular-cordate or suborbicular) basal leaves, campanulate (vs. hemispheric) involucre, and the longer (5–6 vs. ca. 2 mm) pappus. A detailed comparison of the three species is given in Table 1. It is worth mentioning that *C. cyclaminanthum* was often recorded to occur in southwestern Sichuan and northwestern Yunnan (Dêqên, Ninglang, Zhongdian) (Wu 1984, Chen & Li 1994, Min 2004, Liu & Illarionova 2011), but actually this species is only known from its type locality, i.e. Muli in southwestern Sichuan, with its type collection, *H. Handel-Mazzetti* 7450, being the only gathering ever made. The record of the occurrence of *C. potaninii* in southwestern Gansu by Liu (1989) and Liu & Illarionova (2011) is also not correct. In Gansu this species is only known from Zhugqu in the southeastern part of the province, which is closely contiguous to northwestern Sichuan, the primary distribution area of *C. potaninii*. Liu & Illarionova (2011) suspected *C. potaninii* to occur in Shaanxi. No *Cremanthodium* species have thus far been known from that province, although the distributional range of *Cremanthodium* was extended to Taibai Shan in Shaanxi by Good (1929) who treated *Ligularia hookeri* (Clarke 1876: 169) *Handel-Mazzetti* (1938: 69) as *C. hookeri* Clarke (1876: 169).

TABLE 1. Comparison of *Cremanthodium cyclaminanthum*, *C. liangshanicum*, and *C. potaninii*.

	<i>C. cyclaminanthum</i>	<i>C. liangshanicum</i>	<i>C. potaninii</i>
Stem	1–3, 15–20 cm tall, glabrous proximally, brown velvety pilose distally	solitary, 20–30 cm tall, glabrous proximally, slightly purplish-black pilose and slightly white arachnoid distally	solitary or 2, 5–30 cm tall, slightly white arachnoid-pubescent proximally, densely white arachnoid distally
Basal leaf	4–14; leaf blade suborbicular-cordate or suborbicular, base cordate, apex rounded or obtuse	3–8; leaf blade ovate or ovate-oblong, base rounded, obliquely cuneate, or rarely shallowly cordate, apex obtuse	2–10; leaf blade ovate-cordate, ovate-triangular or ovate-lanceolate, base cordate or truncate, apex acuminate or acute
Stem leaf	absent or 1, linear, ca. 1 cm long	1–4, oblanceolate-ovate or oblanceolate to linear, 0.5–1 cm long	2–7, linear, 1.5–6 cm long
Capitulum	nodding	nodding	erect, semi-erect, or nodding
Involucre	hemispheric, 0.8–1 cm high, ca. 2 cm in diam.	campanulate, ca. 1 cm high, 1.2–2 cm in diam.	campanulate or broadly campanulate, 0.8–1.4 cm high, 1.4–2.4 cm in diam.
Phyllary	10–12, outer ones 2.5–3 mm wide, inner ones 3.5–4 mm wide, sparsely brown pilose or glabrous	8–10, outer ones 1–1.5 mm wide, inner ones 2.5–3 mm wide, outside glabrous or sparsely black pilose on the lower part	12–16, outer ones ca. 1.5 mm wide, inner ones 2–3 mm wide, outside white arachnoid
Ray floret	9–13; lamina oblong, 1–1.3 cm long, 4–5.5 mm wide, apex acute	7–10; lamina oblong, 1–1.3 cm long, 4–5 mm wide, apex acute	12–16; lamina linear, 1.5–3.5 cm long, 2–3 mm wide, apex acuminate or acute
Achene	cylindrical, ca. 2 mm long	cylindrical, 2–3 mm long	cylindrical, 5–6 mm long
Pappus	ca. 2 mm long, brownish	5–6 mm long, whitish or brownish	6–8 mm long, purplish or brownish
Distribution	southwestern Sichuan (Muli) (Fig. 3)	southwestern Sichuan (Xichang, Zhaojue) (Fig. 3)	southeastern Gansu (Zhugqu), northwestern Sichuan (Aba, Baoxing, Barkam, Dawu, Dêgê, Heishui, Hongyuan, Jinchuan, Jiulong, Kangding, Lixian, Luhuo, Maoxian, Sêrxù, Songpan, Wenchuan, Xiaojin) (Fig. 3)

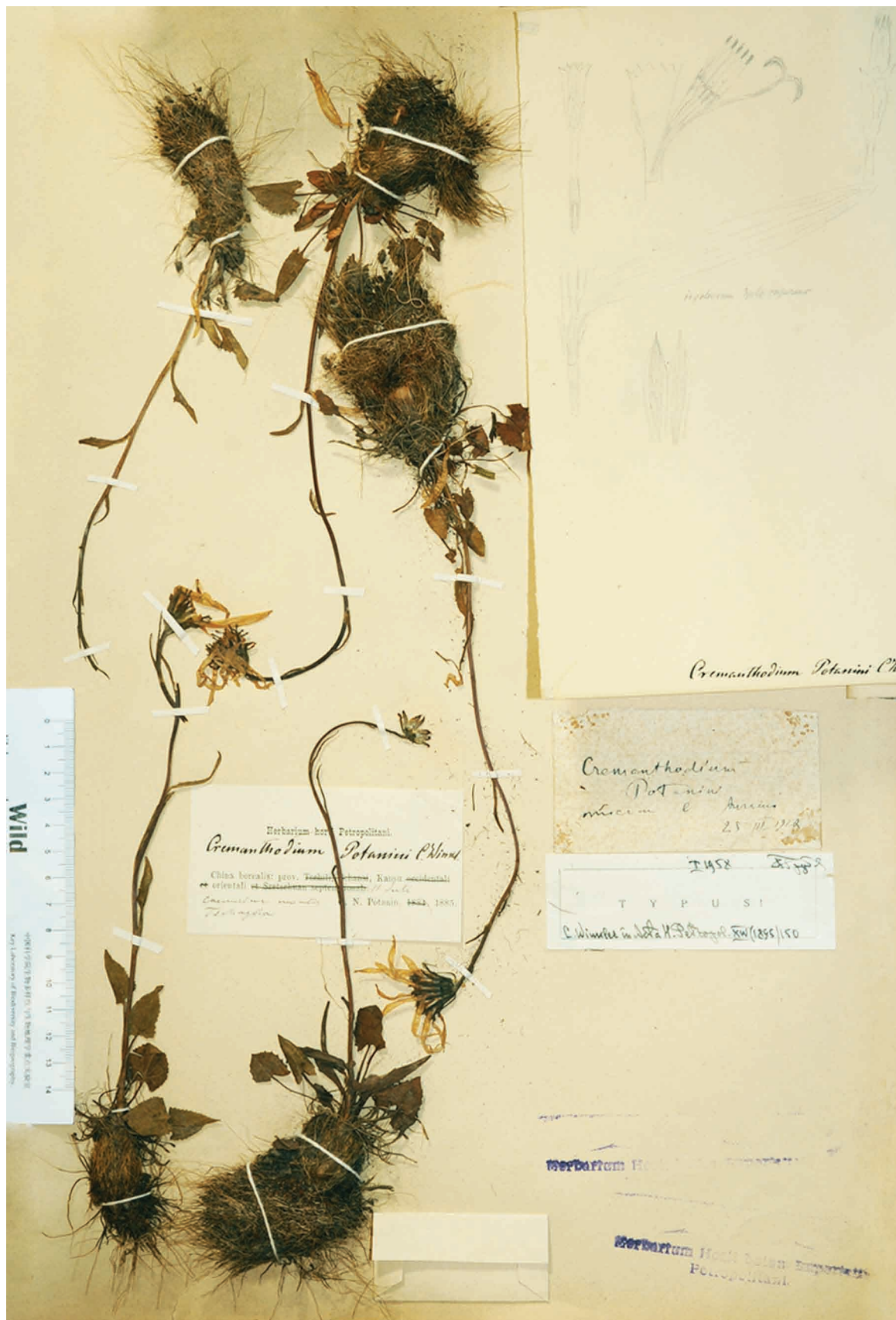


FIGURE 5. Holotype sheet of *Cremanthodium potaninii*.



FIGURE 6. Type specimens of *Cremanthodium cyclaminanthum*. **A.** China, Sichuan, Muli, *H. Handel-Mazzetti* 7450 (WU, syntype). **B.** Same locality, *H. Handel-Mazzetti* 7450 (W, syntype).

According to the infrageneric classification of *Cremanthodium* by Liu (1982, 1989), *C. liangshanicum* can be referred to *C. ser. Oblongata* Ling & Liu in Liu (1989: 145) under *C. sect. Pinnatinervia* Ling & Liu in Liu (1982: 51; “*Pinnatinervus*”) by having ovate or ovate-oblong leaves with pinnate veins and oblong ray laminae with an acute apex. Both of its putative close relatives, *C. cyclaminanthum* and *C. potaninii*, have also been previously placed in this series by Liu (1989).

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