

## *Saussurea wenchengiae* (Asteraceae), a new species from Qinghai, China

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*Saussurea wenchengiae* B.Q. Xu, G. Hao & N.H. Xia, a new species from Qinghai, China, of *Saussurea* subg. *Amphilaena* sect. *Pseudoamphilaena*, is described and illustrated. It is similar to *S. polycolea*, but differs in its shorter stature, narrowly elliptic middle and upper stem leaf blade with a denticulate margin, and a cylindrical or narrowly campanulate involucre. A color plate, line drawings, a distribution map of *S. wenchengiae*, and SEM microphotographs of the leaf surfaces of *S. wenchengiae* and *S. polycolea* are provided.

During field work undertaken in September 2008 to investigate *Saussurea* populations and collect seeds for the Southwest China Germplasm Bank of Wild Species, two unusual populations were found: one on grassy slopes with scattered *Rhododendron nivale* bushes and the second in a grazing meadow in Yushu Tibetan Autonomous Prefecture, Qinghai province, China. Because of their stature, elliptic or ovate basal and lower stem leaves, and pedunculate, solitary terminal capitula, at first glance the plants appeared to be *Saussurea polycolea* (Lipschitz 1979, Chen 1985, Liu 1996, Chen & Shi 1999, Shi & von Raab-Straube 2011). Upon closer examination, however, we found that the plants differed markedly from *S. polycolea* in several characters. They could not be assigned to any known species of *Saussurea*. Therefore, we concluded that the plants represented a hitherto undescribed species.

***Saussurea wenchengiae*** B.Q. Xiu, G. Hao & N.H. Xia, *sp. nova* (Figs. 1 and 2)

TYPE: China. Qinghai, Yushu Tibetan Autonomous Prefecture, Yushu County, Jiegu Town, Lebagou Valley, 4276 m, 32°5'37.26''N, 97°6'57.36''E, *Rhododendron nivale* bush scattered grassy slopes, 7 Sep. 2008 Bing-qiang Xu, Chao-han zheng & Wei Zhou Xianh 0316 (holotype IBSC). — PARATYPE: China. Qinghai, Yushu Tibetan Autonomous Prefecture, Chengduo County, Qingshuihe Town, side of National Highway No. 214, 4434 m, 33°7'42.3''N, 97°8'44.7''E, grazing meadow, 13 Sep. 2008 Bing-qiang Xu, Chao-han zheng & Wei Zhou Xianh 0432 (IBSC).

ETYMOLOGY. The specific epithet is in honor of Princess Wencheng, a famous and important woman in Chinese history. The Temple of Princess Wencheng (Wenchengmiao in Chinese) is situated at the type locality.

Herbs, perennial, 3–5 cm tall. Rhizomes slender. Stem solitary or cespitose, 1–1.5 mm in diam., erect, base covered with brown residue

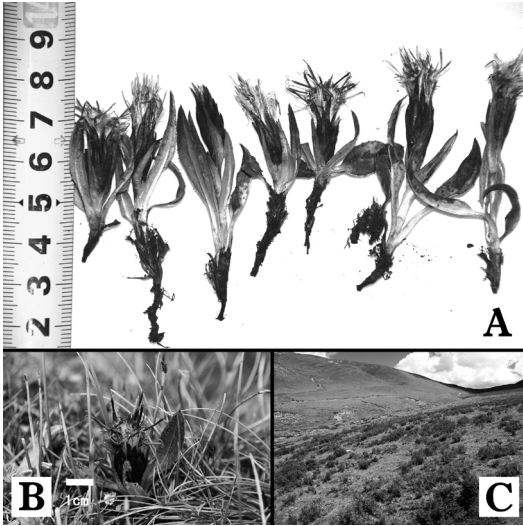


Fig. 1. *Saussurea wenchengiae*. — A: Habit (type material). — B: Habit in the wild. — C: Habitat.

of petioles. Basal and lower stem leaves petiolate, petiole 0.5–0.8 cm; leaf blade elliptic or ovate, 1–1.5 × 0.5–0.8 cm, both surfaces dark green, with a covering of white early dehiscent trichomes, base rounded to broadly cuneate,

margin denticulate, midvein thick and abaxially raised and densely white villous, apex cuspidate. Middle stem leaves petiolate, petiole 1–2 cm, base semiamplexicaul, leaf blade narrowly elliptic, 1.8–2.5 × 0.3–0.7 cm, both surfaces dark green, indumentum white and then largely dehiscent, base narrowly cuneate, margin denticulate, midvein thick and abaxially raised and densely white villous, apex acuminate. Upper stem leaves similar and smaller in form to middle stem leaves, sessile, base semiamplexicaul. Uppermost stem leaves triangular and boat-shaped, 1.2–2 × 0.3–0.5 cm, not aggregated below capitulum, distant from each other, not covering capitulum, both surfaces purplish red and white villous. Capitulum solitary, pedunculate, terminal on stem. Involucre cylindrical or narrowly campanulate, 0.6–1 cm in diam. Phyllaries blackish purple, in 4 or 5 rows, abaxially glabrous, apex acuminate to long acuminate; outer phyllaries oblong-lanceolate, ca. 1.4 cm × 3 mm; middle phyllaries oblong-lanceolate, ca. 1.5 cm × 2 mm; inner phyllaries narrowly lanceolate to linear, ca. 1.7 cm × 1.2–1.5 mm. Receptacle bristles 5–7 mm. Florets ca. 15, tubular, bisexual, corol-

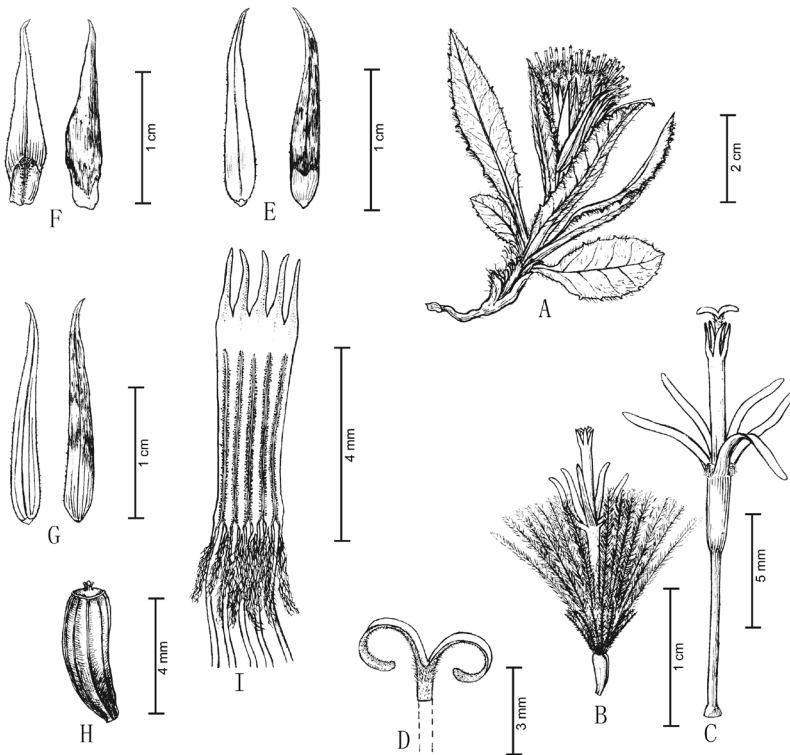
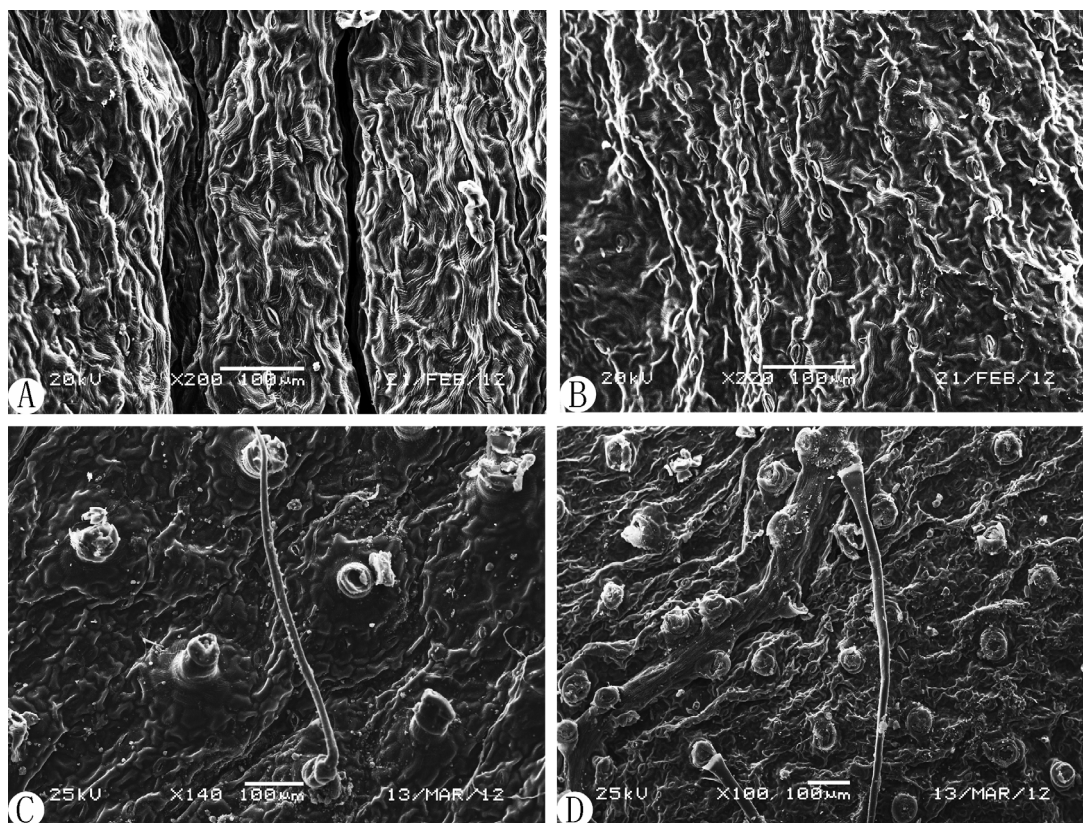


Fig. 2. *Saussurea wenchengiae* (from the holotype). — A: Habit — B: Floret. — C: Floret without achene and pappus. — D: Style arms. — E: Middle phyllary (left, adaxial surface; right, abaxial surface). — F: Outer phyllary (left, adaxial surface; right, abaxial surface). — G: Inner phyllary (left, adaxial surface; right, abaxial surface). — H: Achene. — I: Stamens (opened up).



**Fig. 3.** SEM microphotographs of leaf surfaces of *Saussurea wenchengiae* and *S. polycolea*. — **A** and **B**: *Saussurea wenchengiae* (from the holotype). **A**: Adaxial surface of middle stem leaf. **B**: Abaxial surface of middle stem leaf. — **C** and **D**: *Saussurea polycolea* (from *You-sheng Chen and Ze-huan Wang 9373*, KUN). **C**: Adaxial surface of middle stem leaf. **D**: Abaxial surface of middle stem leaf.

las purple, ca. 1.6–1.8 cm, tubes 5–9 mm, limbs 7–9 mm, lobes ca. 3.5–4 mm, anthers sagittate, base caudate, appendages 2.2–2.5 mm, apical sterile appendages 1.5–2 mm; styles 1.8–2 cm, branches 3.2–3.7 mm; sweeping hairs mainly confined to base of style branches. Achene straw-colored, obconic, 3–4.5 mm, 5-ribbed. Pappus dirty white, in 2 rows; outer bristles 3–3.5 mm, scabrous; inner bristles 1.2–2 cm, plumose. Flowering and fruiting August–September.

The purplish red, boat-shaped, membranous uppermost stem leaves which are distant from each other and not aggregated below the capitulum, or covering the capitulum suggest that *S. wenchengiae* is a member of *Saussurea* subg. *Amphilaena* sect. *Pseudoamphilaena* (Lipschitz 1979).

Eckhard von Raab-Straube of Botanischer Garten und Botanisches Museum Berlin, the

co-author of the *Flora of China* for the genus *Saussurea*, compared this new species with *S. erubescens* (Lipschitz 1979, Chen 1985, Liu 1996, Chen & Shi 1999, Shi & von Raab-Straube 2011) and *S. gymnocephala* (von Raab-Straube 2011, Shi & von Raab-Straube 2011). He indicated in an e-mail message to the first author that the presumably new species differs from both of the above-mentioned species by the large cylindrical involucre with much longer phyllaries, and by the pilose or villous (*vs.* glabrous or glandular) indumentum, and from *S. gymnocephala* by the denticulate (*vs.* entire) leaf margin (von Raab-Straube 2011, Shi & von Raab-Straube 2011). Additionally, the coloured uppermost stem leaves of *S. gymnocephala* are aggregated below and half-enclosing the synflorescence (*vs.* not aggregated and not enclosing the synflorescence), and *S. erubescens*



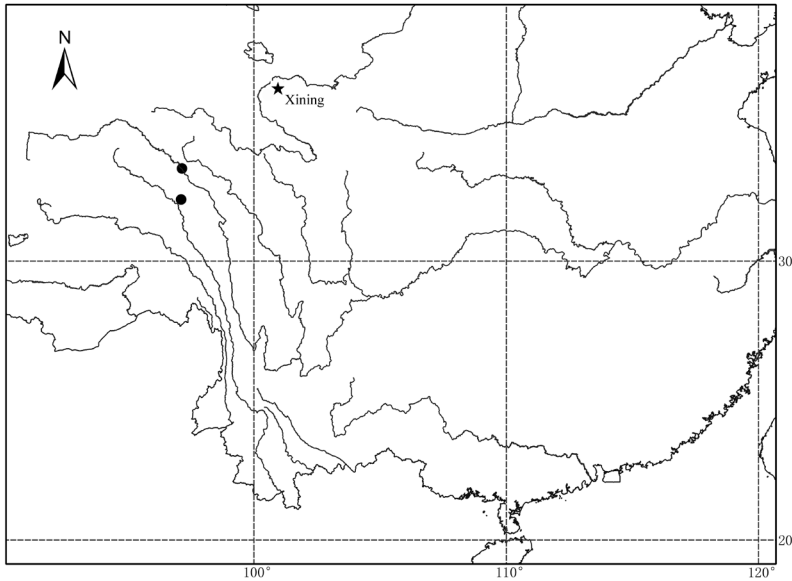


Fig. 4. Distribution of *Saussurea wenchengiae* (●).

usually possesses numerous capitula (2–5 vs. always one). We think *S. wenchengiae* is more similar to *S. polycolea* in its uppermost coloured leaves and solitary capitulum, but differs from the latter in its shorter stature, symmetric base of basal and lower stem leaves (vs. asymmetric), sparsely pilose surfaces of the middle leaves (middle leaves with a covering of dehiscent trichomes, Fig. 3A–B) (vs. villous, Fig. 3C–D), and cylindrical or narrowly campanulate involucre, 0.6–1 cm in diam. (vs. obconic to campanulate, 1–2.5 cm in diam.).

**DISTRIBUTION AND HABITAT.** Southwest Qinghai, China (Fig. 4), rare, currently only known from two localities in Three-River-Source (Sanjiangyuan) Nature Reserve, southern Qinghai Province, China. It grows on grassy slopes with scattered *Rhododendron nivale* bushes in a valley, at 4276 m a.s.l. and in a grazing meadow, near a stream, mainly scattered with *Agrimonia pilosa*, *Leontopodium nanum*, *Taraxacum leucanthum* and *Gentiana syringea*, at 4434 m a.s.l.

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