

Saussurea bijiangensis (Asteraceae), a new species from Yunnan, China

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Saussurea bijiangensis Y.L. Chen ex B.Q. Xu, N.H. Xia & G. Hao (Asteraceae), a new species from Yunnan, China, is described and illustrated. This species is similar to *S. delavayi* var. *hirsuta* and *S. atrata*; the distinctions among them are presented in a table. We show that the name *S. hirsuta* has been misapplied.

Saussurea, consisting of about 400 species, is one of the largest genera in the Asteraceae. The genus is mainly distributed in temperate and subarctic regions of Eurasia. *Saussurea* subg. *Eriocoryne*, the topic of the present paper, with about 40 species, occurs mainly on the higher altitudes of the Qinghai–Xizang Plateau and the adjacent areas (Lipsch 1979, Shih 1999, Shi & von Raab-Straube 2011).

In September 2010, field work was undertaken to investigate *Saussurea* populations and collect seeds for the Southwest China Germplasm Bank of Wild Species in the Yunnan Province of China. Specimens of *Saussurea* deposited in the herbarium KUN were examined. A specimen (*Wu Sugong* 8802) from Bijiang, northwestern Yunnan, caught our special attention. It was labeled in mandarin Chinese ‘*Yingmao Xuetuzi*, (*Yunnan Zhi*)’, meaning it was identified as *Saussurea hirsuta* and cited as such in *Flora Yunnanica* (Liu 2004). The taxon is currently recognized as *S. delavayi* var. *hirsuta* (Shi & von Raab-Straube 2011). At first glance the speci-

men is indeed somewhat similar to *S. hirsuta*, but upon careful examination, we found that the specimen differed markedly from *S. hirsuta*. The specimen could not be assigned to any known species of *Saussurea*. Therefore, we concluded that the plant represents a hitherto undescribed species. Later, a duplicate of the specimen was found by the first author at KUN, labeled as ‘*Saussurea bijiangensis* Y. L. Chen sp. nov.’, so we use that name for the species.

Saussurea bijiangensis Y.L. Chen ex B.Q. Xu, N.H. Xia & G. Hao, *sp. nova* (Fig. 1)

Type: China. Yunnan, Fugong County, Biluoxueshan (Biluo snow mountain), mountain ridge to the south of an emergency shelter, grassy scree slopes, 4400 m a.s.l., 12 September 1964 *Wu Sugong* 8802 (holotype KUN 0729144; isotype KUN 0483982).

Saussurea hirsuta auct., non (Anth.) Hand.-Mazz.: Liu Shangwu in Wu Zhengyi (ed.), *Flora Yunnanica* 13: 535–537. 2004 (p. p.).

ETYMOLOGY. The specific epithet *bijiangensis* is derived from the name of type locality, Bijiang County (an old

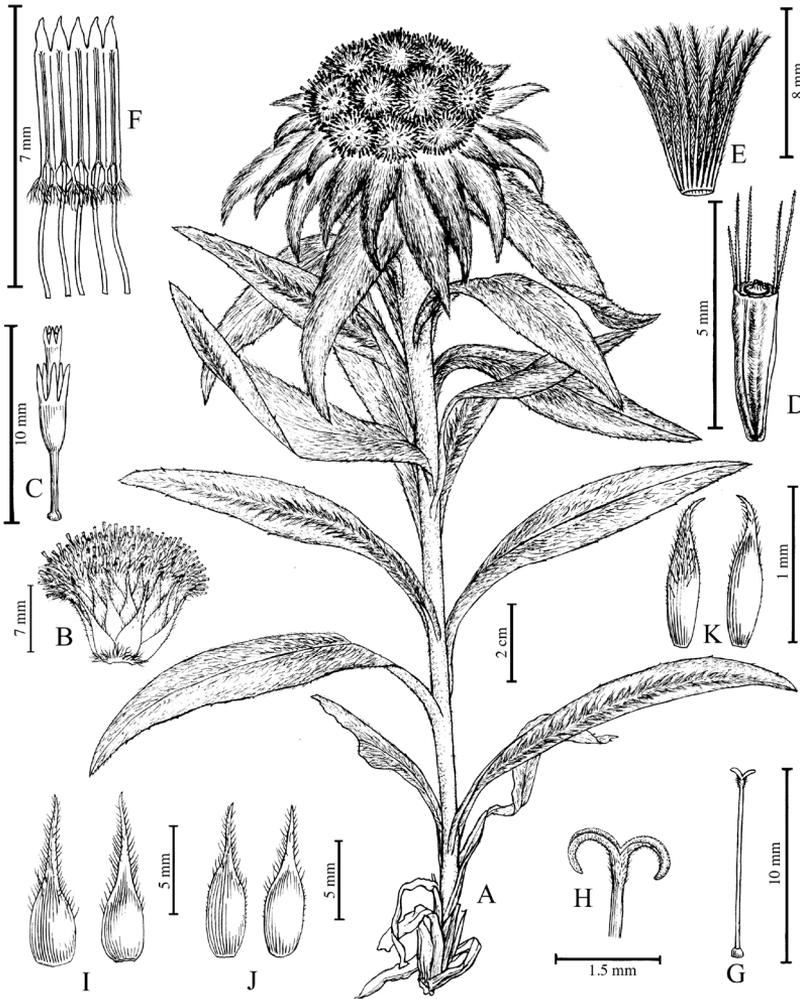


Fig. 1. *Saussurea bijiangensis* (from the holotype). — **A:** Habit. — **B:** Capitulum. — **C:** Corolla, anther cylinder, and style. — **D:** Achene (immature) with part of outer bristles. — **E:** Inner bristles. — **F:** Stamens (opened up). — **G:** Style. — **H:** Style arms. — **I:** Outer phyllary (left, abaxial surface; right, adaxial surface). — **J:** Middle phyllary (left, abaxial surface; right, adaxial surface). — **K:** Inner phyllary (left, abaxial surface; right, adaxial surface).

administrative county name, now refers to the south part of Fugong County and north part of Lushui County) in Yunnan, China.

Herbs ca. 30 cm tall, perennial, monocarpic. Caudex stout, simple, covered with reddish-brown remains of petioles. Stem solitary, 5–8 mm in diam., erect, simple, hollow, pilose. Basal and lower stem leaves petiolate; petiole 2–2.5 cm; leaf blades lanceolate, 10–12 × 1.5–1.8 cm, papery, abaxially grayish green, pilose and white-villous, ca. 0.5–0.8 mm long, adaxially dark green and pilose, margin flat and denticulate, apex acuminate; middle and upper stem leaves sessile, lanceolate, 8–12 × 1.5–1.8 cm, papery, abaxially grayish green, pilose and white-villous, ca. 0.5–0.8 mm long, adaxially

dark green and pilose, margin flat and denticulate, apex acuminate; uppermost stem leaves stellately spreading, clustered and deflexed under synflorescence, pilose and white-villous, triangular-lanceolate, 2–4 × 1–1.2 cm, apex acuminate. Capitula homogamous, 12–20, in a hemispheric synflorescence 5–6 cm diam., sessile; involucre campanulate, 0.7–1.0 cm diam, 1.2–1.5 cm high; phyllaries 4- or 5-seriate, imbricate, blackish, outer phyllaries ovate, 10–12 × 2.5–3 mm; middle phyllaries elliptic, 9–10 × 2.5–2.8 mm; inner phyllaries narrowly elliptic, 7–9 × 1.8–2 mm, all phyllaries caudate and abaxially pilose in upper part; receptacle bristles 5–7 mm long, straw-colored, persistent. Florets 15–20, tubular, bisexual, fertile, corollas rose-purple, glabrous, 8–10

mm long, tubes 4–5 mm long, limbs 2.5–3 mm long, lobes ca. 2.5 mm long, anthers sagittate, apical appendage acute, base caudate with long lacerate tails ca. 0.8 mm long; styles ca. 10 mm, bifid, branches ca. 1.2–1.5 mm long. Achenes immature, grayish brown, obconic, ca. 3 mm long, 1–1.2 mm wide, smooth, glabrous; pappus brown, biseriate, outer bristles 1.8–3 mm, scabrous; inner bristles 8–9 mm, plumose. Flowering and fruiting in September and October.

Saussurea bijiangensis, with its numerous capitula aggregated in a densely congested hemispherical synflorescence in the center of a leaf rosette on the stem and subtended by uppermost stem leaves, belongs to *Saussurea* subg. *Eriocoryne* sect. *Cincta* (cf. Lipschitz 1979). It is closely related to *S. delavayi* var. *hirsuta* and *S. atrata* (cf. Evans 1921). The main morphological differences among the three taxa are summarized in Table 1.

DISTRIBUTION AND HABITAT. Only one specimen *Saussurea bijiangensis* — collected in Biluoxue-shan, south part of Fugong County, Yunnan, China — is currently known. It was growing on a grassy scree slope on a mountain ridge to the south of an emergency shelter, at an elevation of 4400 m a.s.l.

Discussion

There is a special explanation in the description given to *S. hirsuta* in Chinese in *Flora Yunnanica* (Liu 2004): ‘*Xiaohua Guanzhuang, Zise (Jilu wei Huangse)*’, which in English means ‘florets tubular, purple (recorded as yellowish)’. We found the same Chinese words labeled on the field records in the top left corner of the specimen *Wu Sugong 8802*. The term ‘yellowish’ was an error, for the corolla color of almost all species of *Saussurea* is purple. The specimen also has the words ‘*Ying-mao Xuetuzi, (Yunnan Zhi)*’ in the lower right corner of the sheet, meaning ‘*Saussurea hirsuta, (Flora Yunnanica)*’. Checking the collection and comparing it with the whole description of *S. hirsuta* in *Flora Yunnanica*, we concluded that Prof. Liu Shang-wu’s description of *S. hirsuta* in *Flora Yunnanica* was mostly based on this specimen. So the citation of *Wu Sugong 8802* from Fugong County as a part of materials of *S. hirsuta* in *Flora Yunnanica* (Liu 2004) represents a misidentification. *Saussurea hirsuta* (*S. delavayi* f. *hirsuta*) is nevertheless present in Lijiang, as the holotype of *S. delavayi* f. *hirsuta* (Rock J. F. 9522) was collected in Lotueshan, mountains of Labako, Lijiang County, Yunnan.

Table 1. Morphological differences between *Saussurea bijiangensis*, *S. delavayi*, *S. delavayi* var. *hirsuta* and *S. atrata*.

Character	<i>S. bijiangensis</i>	<i>S. delavayi</i>	<i>S. delavayi</i> var. <i>hirsuta</i>	<i>S. atrata</i>
Stem	ca. 30 cm long, 5–8 mm in diameter, pilose	15–35 cm long, 4–6 mm in diameter, glabrous or sericeous-villous	15–35 cm long, 4–6 mm in diameter, glabrous or sericeous-villous	ca. 50 cm long, 10–12 mm in diameter, puberulent
Basal leaves	usually withered, 15–18 mm wide, thinly papery-leathery	usually numerous, 2–5(8) mm, leathery	usually numerous, 5–8 mm, leathery	usually withered, 10–15 mm wide, leathery
Leaf shape	lanceolate	linear, adaxially	linear, adaxially	broadly linear,
indumentum	adaxially pilose, abaxially pilose and white-villous	glabrous, abaxially sericeous-villous and gland-dotted	sericeous-villous, abaxially sericeous-villous and gland-dotted	adaxially sparsely lanate, abaxially densely lanate
margin	flat and denticulate	revolute, entire or denticulate	revolute, entire or denticulate	revolute and entire
Bracts or uppermost stem leaves	deflexed under synflorescence	overtopping synflorescence	overtopping synflorescence	overtopping synflorescence

The type localities of *S. bijiangensis* and *S. delavayi* f. *hirsuta* are in the Three Parallel Rivers of Yunnan protected areas, one of the most diverse biodiversity hotspots in the world. The Jinsha, Lancang and Nujiang rivers originate from the Qinghai–Xizang Plateau, and flow abreast southward from the Hengduan Mountains to the sea. Due to isolation of the three rivers and the high altitudes, various kinds of alpine habitats are present in the protected areas. The type locality of *S. bijiangensis*, Biluoxueshan, in the south part of Fugong County, is to the west of the Lancang river. The type locality of *S. delavayi* var. *hirsuta*, Lotuoshan, mountains of Labako, west of the Yangtze bend at Shiku, is to the east of the Lancang river. As for *S. atrata*, so far it has not been found in China, the provenance being in the adjacent Myanmar.

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References

- Anthony, J. 1934: Diagnoses specierum novarum in herbaria Horti Regii Botanici Edinburgensis Cognitarum DLXX–DC. — *Notes from the Royal Botanic Garden, Edinburgh* 18: 205.
- Evans, W. E. 1921: Diagnoses specierum novarum in herbario Horti Regii Botanici Edinburgensis cognitarum DI–DL. — *Notes from the Royal Botanic Garden, Edinburgh* 13(63–64): 180–181.
- Handel-Mazzetti, H. 1937: Neue und bemerkenswerte chinesische Compositen, besonders aus dem Berliner Herbar (mit Abb. 13). — *Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem* 13: 649–699.
- Lipschitz, S. [Липшиц, С.] 1979: [*Genus Saussurea* DC. (Asteraceae)]. — *Nauka, Sectio Leninopolitana, Leningrad*. [In Russian].
- Liu, S. W. 2004: *Saussurea* DC. — In: Wu, Z. Y. (ed.), *Flora Yunnanica* 13: 518–579. Science Press, Beijing. [In Chinese].
- Shih, C. & Jin, S. Y. 1999: Compositae (8): II. Cynareae, *Saussurea* DC. — In: Chen, T. L. & Shih, C. (eds.), *Flora Reipublicae Popularis Sinicae* 78(2): 1–213. Science Press, Beijing. [In Chinese].
- Shi, Z. & von Raab-Straube, E. 2011: *Saussurea* DC. — In: Wu, Z. Y., Raven, P. H. & Hong, D. Y. (eds.), *Flora of China*, vol. 20–21 (Asteraceae): 56–149. Science Press (Beijing) & Missouri Botanical Garden Press, St. Louis.