

A New Species of *Saussurea* DC. (Asteraceae) from the Nepal Himalaya

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A new species, *Saussurea rolwalingensis* (subgenus *Saussurea* section *Cyathidium*) is described from the Nepal Himalaya. It differs from *S. donkiah* C. B. Clarke ex L. S. Springate in having a well-developed fibrous rhizome and tubular involucre. Morphological comparisons between the new species and allied members of sect. *Cyathidium* from Nepal are presented.

Key words: Compositae, Flora of Nepal, new species, *Saussurea*, section *Cyathidium*.

Saussurea DC. subgenus *Saussurea* section *Cyathidium* (Lindl. ex Royle) Ling is distributed in the alpine to the subnival zones of the Himalayas and Central Asia and is characterized by pinnatisect leaves and a single capitulum borne on a simple stem (Lipschitz 1979). Eight species are currently recognized from the Nepal Himalaya; *Saussurea polystichoides* Hook. f., *S. leontodontoides* (DC.) Sch. Bip., *S. sughoo* C. B. Clarke, *S. nepalensis* Spreng., *S. taraxacifolia* Wall. ex DC., *S. roylei* (DC.) Sch. Bip., *S. stoliczkae* C. B. Clarke, *S. donkiah* C. B. Clarke ex L. S. Springate (Lipschitz 1979, Chater and Kitamura 1982, Grierson and Springate 2000, Fujikawa et al. 2007). During the fieldwork towards a revision of *Saussurea* for the Flora of Nepal, a number of interesting plants belonging to subgen. *Saussurea* sect. *Cyathidium* were collected at Rolwaling, Central Nepal in 1983 (Anonymous 1986, Ohba 2002). A specimen among these collections superficially

resembled *S. donkiah*, but was subsequently found to differ from the latter in the presence of a fibrous rhizome as well as several other morphological characters, as shown in Table 1. The material is formally recognized as a new species here, and a full description and illustration are presented below.

Saussurea rolwalingensis K. Fujikawa & H. Ohba, sp. nov. [Figs. 1–2]

Saussureae donkiahae primo ad aspectu maxime similis, sed rhizomate fibroso et involucro tubuloso bene differt.

Type: Nepal, Dolakha Distr., Rolwaling Khola, Na–Sangma–Khabun–Na, alt. 4050–4400 m, 6 Sept. 1983, H. Ohba, M. Wakabayashi & S. Akiyama 8331885 (TI–holotype; KATH–isotype).

Acaulous, rosulate, polycarpic herb. Rhizome elongate, thick, fibrous, well-branched at ground level. Flowering stem erect, solitary, simple, base with up to 18 vegetative shoots (based on herbarium

Table 1. Morphological comparisons of *Saussurea rolwalingensis* and similar species in subgenus *Saussurea* section *Cyathidium*

	<i>S. rolwalingensis</i>	<i>S. donkiah</i>	<i>S. leontodontoides</i>
Rhizome	fibrous, thick, elongated	slender, short	fibrous, short to elongated
Involucre shape	tubular	campanulate	tubular or campanulate
Pappus seriation	bi-seriate	bi-seriate	bi-seriate
Pappus uniformity	uniform	uniform	dimorphic
Pappus shape	plumose	plumose	outer pappus bristles scabrid to barbate, deciduous, inner ones plumose

Voucher specimens of *Saussurea rolwalingensis* were shown in taxonomic treatment. Those of *S. donkiah* were J. D. Hooker s. n. (E); J. D. A. Stainton 1325 (E); S. Macpherson 118 (E); R. E. Cooper 1734 (E); G. & S Miehe 00-318-06 (E); KEKE 569 (E). Those of *S. leontodontoides* were F. Miyamoto & al. 9580313, 9584195 (TI).

specimens observed here) and enclosed with numerous withered dark brown leaves of previous years. Rosulate leaves petiolate or subsessile; up to 15 mm long, reddish purple; lamina lanceolate or oblong, 2.5–3.5 × 0.6–1.0 cm, pinnatisect, with 7–12 paired lobes, adaxial surface dark green, glandular hairy and sparsely araneous, with inconspicuous midrib, abaxial surface densely white-tomentose, with conspicuous midrib; lobes transversely oblong, broadly ovate or triangular, ca. 3 mm long, with 2 or 3(–4) irregular teeth, each tooth with a mucron, apex acute and mucronate.

Flowering from August to September. Capitulum solitary. Involucre tubular, 5–10 mm in diameter. Involucral phyllaries 4- or 5-seriate, imbricate, abaxial surface sparsely to densely araneous with glandular hairs in upper part; outer phyllaries ovate to broadly ovate, 9–14.5 × 2.8–3.8 mm, base coriaceous, light brown, brown or purplish-brown, apex attenuate, rarely pinnatifid in upper part, reflexed or occasionally erect, herbaceous, dark green or green; inner phyllaries linear, narrowly lanceolate or lanceolate, 13.2–18 × 1.3–2 mm, base coriaceous, light brown, apex attenuate, reflexed or occasionally erect, herbaceous, araneous, dark green, blackish or purplish. Receptacle convex, setaceous, setae 5–7 mm long.

Corolla actinomorphic, 13–15 mm long, bright bluish or purple; tube 7.5–9 mm long; limb (including lobes) 6.2–7 mm long; lobes 3.2–4.5 mm long, reflexed at flowering. Anthers sagittate, 4.8–6.6 mm long (including tails), tails 1.2–2.9 mm long, minutely incised, dark purple or bluish-purple. Style 14.5–16.9 mm long; branches 1.8–2.5 mm long, base and abaxial surface of branches papillose. Achenes at anthesis cylindrical, 2.0–2.5 × 0.5–0.9 mm, 4- or 5-angled, rugulose or rugulose in upper part, with pericarpal crown on rim. Pappus 2-seriate; outer pappus bristles (9–)20–32, caducous, plumose, 2.2–10 mm long, free, light brown; inner pappus bristles 12–19, persistent, plumose, 10–13 mm long, basally connate, light brown or brown.

Ecology: Alpine to icebound zone, alt. 4050–5300 m.

Distribution: Central Nepal. Endemic.

Other specimens examined: **NEPAL**; Central Nepal, Dolakha Distr. Rolwaling Khola, Na–Yalung Kharka, alt. 4050–4750 m, 7 Sept. 1983, H. Ohba & al. 8351361 (TI, KATH, KYO); Yalung Kharka–Yalung La–Pam Lhang, alt. 4300–5300 m, 8 Sept. 1983, H. Ohba & al. 8331926 (TI, KATH, KYO).

This species is similar to *Saussurea donkiah* C. B. Clarke ex S. L. Springate and *S. leontodontoides* (DC.) Sch. Bip. in its acaulous, polycarpic habit, its pinnatisect,

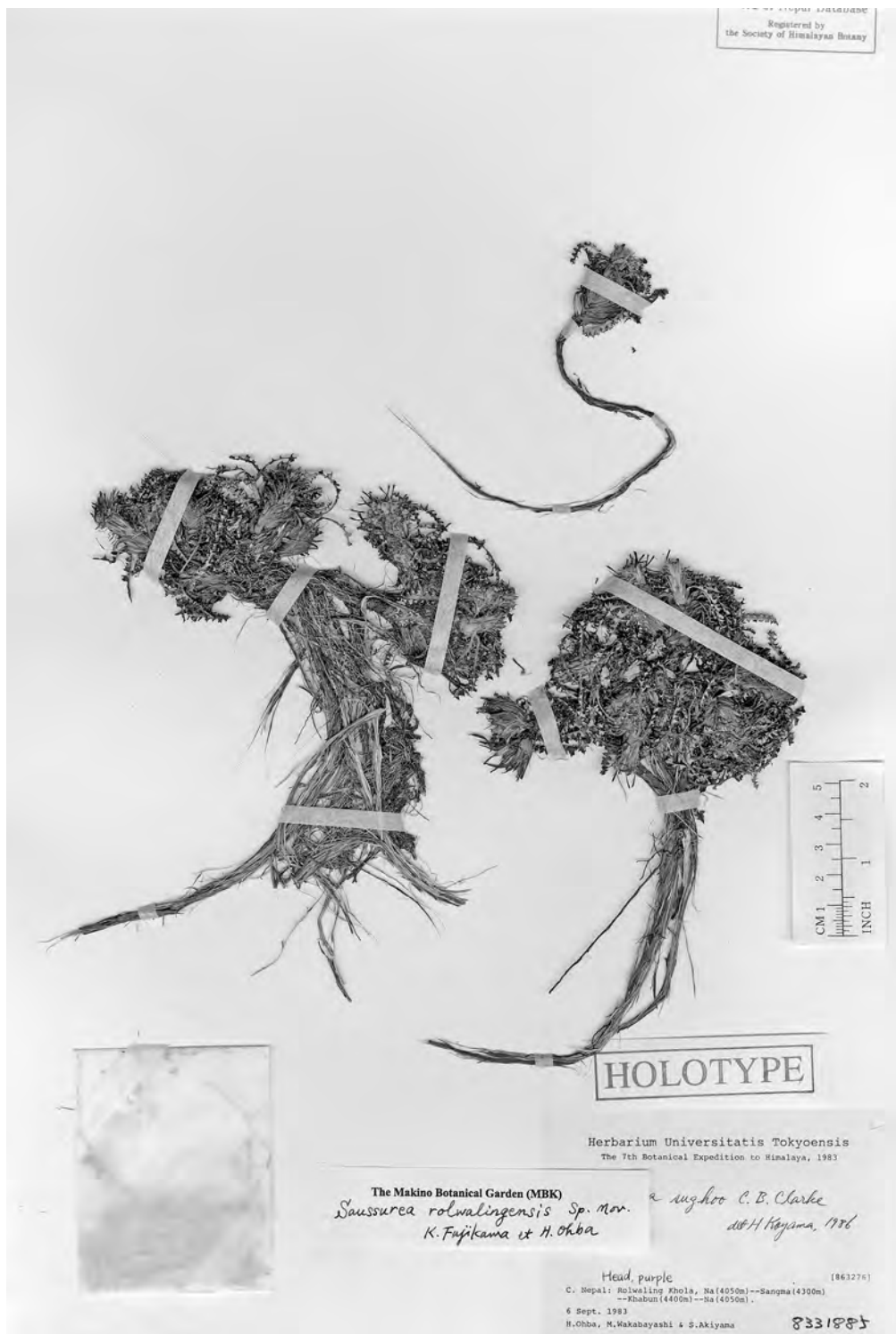


Fig. 1. Holotype of *Saussurea rolwalingensis* K. Fujikawa & H. Ohba (NEPAL: Rolwaling Khola, Na-Sangma-Khabun-Na, 4050–4400 m, 6 Sept. 1983, H. Ohba & al. 8331885, TI).

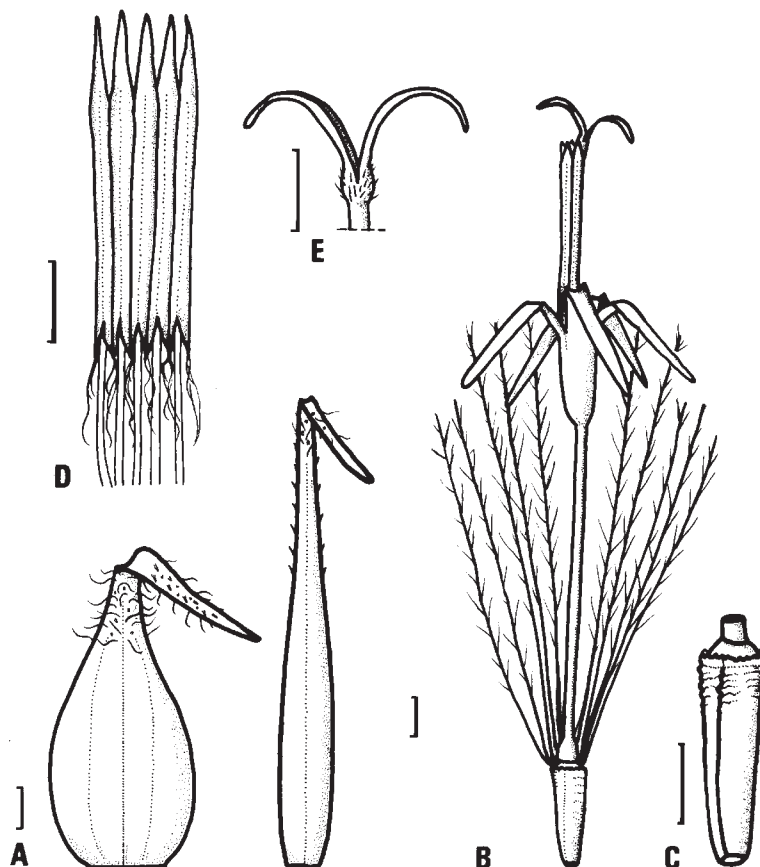


Fig. 2. *Saussurea rolwalingensis* K. Fujikawa & H. Ohba (voucher: NEPAL: Rolwaling Khola, Na-Yalung Kharka, 4050–4750 m, 7 Sept. 1983, H. Ohba & al. 8351361, TI). A. Outer and inner involucre phyllaries. B. Floret (removed front pappus). C. Achene at anthesis. D. Opened anthers (abaxial side). E. Style branches. Scale bars indicate 1 mm.

tomentose leaves with glands on abaxial surface and setaceous receptacles. However, *S. donkiah* has short rhizomes with slender stolons and campanulate involucre, while *S. rolwalingensis* has a well-developed fibrous thick rhizome and tubular involucre (Table 1). The distribution of *Saussurea donkiah* spreads over eastern Nepal, Sikkim, Tibet (Chumbi) and Bhutan (Grierson and Springate 2000), whereas *S. rolwalingensis* is restricted to Central Nepal. On the other hand, *S. leontodontoides* has dimorphic pappus bristles, with those of the outer series being scabrid and those of inner series being

plumose, as opposed to the uniformly plumose pappus bristles in *S. rolwalingensis* (Table 1). *Saussurea fibrosa* W. W. Sm. is also similar in being acaulous and having a stout, fibrous rhizome. However, it differs from *S. rolwalingensis* in having campanulate involucre and lyrate to runcinate leaves (observations made on the type material at CAL). *Saussurea fibrosa* is known from Bhutan and northeastern Dajileeng.

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specimens: CAL, E, KYO and TI. We express our appreciation to Stephan Gale, The Kochi Prefectural Makino Botanical Garden, for checking the English and for his comments on the text. This study was partly supported by a Grant-in-Aid for Scientific Research (A) from the Japan Society for the Promotion of Science, No. 18255004 (to H.O.).

References

- Anonymous 1983. Cooperative botanical researches between the University of Tokyo and the Department of Medicinal Plants, Nepal in 1983 and 1985. *Newslet. Himal. Bot.* (1): 1–9.
- Chater A. O. and Kitamura S. 1982. *Saussurea*. In: Hara H. and Williams L. W. J. (eds.), *An Enumeration of the Flowering Plants of Nepal*. 3: 37–41. British Museum (Nat. Hist.), London.
- Fujikawa K., Kita Y. and Ohba H. 2007. Taxonomic status of *Saussurea yakla* (Asteraceae) from the Himalayas. *J. Jpn. Bot.* 82: 130–136.
- Grierson A. J. C. and Springate L. S. 2000. Notes relating to the Flora of Bhutan: XLI. Compositae (Asteraceae). *Edinb. J. Bot.* 57(3): 397–412.
- Lipschitz S. 1979. Genus *Saussurea* DC. (Asteraceae). 283 pp. Nauka, Leningrad.
- Ohba H. 2002. Three epochs of Himalayan botany and prospects for this century. In: Noshiro S. and Rajbhandari K. R. (eds.), *Himalayan Botany in The Twentieth and Twenty-first Centuries*. pp. 30–71. The Society of Himalayan Botany, Tokyo.
- 藤川和美^a, 大場秀章^b: ネパールより見いだされたトウヒレン属 *Cyathidium* 節 (キク科) の1新種
- ネパール産トウヒレン属 (*Saussurea*) の再検討を行う過程で, 第2著者らが1983年中央ネパール, ロールワリン地域で採集した標本が *Cyathidium* 節に属する新種であることが判明したので, *Saussurea rolwalingensis* K. Fujikawa & H. Ohba として記載した. 本種は *S. leontodontoides* (DC.) Sch.
- Bip. と混同されていたが, 2列ある冠毛がいずれも羽毛状である点で異なる. また, *S. donkiah* C. B. Clarke ex S. L. Springate に類似するが, 繊維質の根茎が地際でよく発達することや総苞が筒状であることで明らかに異なる.

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