



## Two new synonyms in Himalayan *Saussurea* (Asteraceae)

QIAN YUAN<sup>1,2</sup> & YOU-SHENG CHEN<sup>1\*</sup>

<sup>1</sup> State Key Laboratory of Systematic and Evolutionary Botany, Institute of Botany, Chinese Academy of Sciences, 20 Nanxincun, Xiangshan, Beijing 100093, China

<sup>2</sup> University of Chinese Academy of Sciences, Beijing 100049, China.

\* Author for correspondence: e-mail: [maple@ibcas.ac.cn](mailto:maple@ibcas.ac.cn)

*Saussurea* Candolle (1810: 156) is one of the largest genera in the tribe Cardueae (Asteraceae) which includes over 400 species (Lipschitz 1979; Shi & Raab-Straube 2011).

Lipschitz (1982) described the name *Saussurea stafleuana* based on materials from Dhaulagiri Himal, Nepal. Lipschitz (1982) noted *S. stafleuana* is similar to *S. columnaris* Handel-Mazzetti (1937: 652) but characterized it by having much smaller cushions, smaller capitula and hidden in sericeous snowy hairs, narrower leaves, apex not cartilaginous-mucronate, white pappus bristles, densely white sericeous villous phyllaries. However the above characters are shared by *S. graminifolia* Wallich ex Candolle (1838: 536), which was described based on materials from Kumaon, India. The type material of *S. stafleuana* is stemless or shortly stemmed, and forming cushions, while the stem of *S. graminifolia* is usually recorded as being 7–20 cm long and solitary. During the field expedition to Nylam, Xizang, China, we found that the length and number of stems are very variable in *S. graminifolia*, sometimes solitary, sometimes several and forming small cushions. *Saussurea stafleuana* and *S. graminifolia* both are characterized by their narrowly linear leaves and phyllaries densely white sericeous villous. After having checked the type material of *S. stafleuana*, we found that this name should be reduced into the synonymy of *S. graminifolia*.

Chen *et al.* (1981: 95) described *S. lyratifolia* Y. L. Chen & S. Yun Liang based on specimens from Bomi County, southeastern Xizang, China. They noted that *S. lyratifolia* is similar to *S. auriculata* (Candolle 1838: 541) Schultz Bipontinus (1846: 331) (which is now in the genus *Himalaiella* Raab-Straube 2003: 390) but differs in its leaf blade lyrate-pinnatisect, lateral segments ovate, capitula 5 and shortly pedunculate, phyllaries in ca. 4 series, achenes smooth, and pappus in 2 series. Shih & Jin (1999) placed *S. lyratifolia* in *S.* subgen. *Frolovia* (Candolle 1838: 538) Lipschitz (1961: 370), whereas Shi & Raab-Straube (2011) moved *S. lyratifolia* to *S.* subgen. *Saussurea* and noted its similarity to *S. laneana* Smith (1911: 74). We agree with the opinion of Shi & Raab-Straube. *Saussurea laneana* was described from Sikkim and was only known from its type material since its publication (Hajra 1995; Kumar & Singh 2001), though it was doubtfully recorded from Bhutan based on a sterile plant (Grierson & Springate 2001). Smith (1911) noted *S. laneana* is most similar to *S. costus* (Falconer 1841: 475) Lipschitz (1964: 131) [which is now in the genus *Aucklandia* Falconer (1841: 475)] in the general appearance but is usually 0.6–0.9 m tall and has capitula much smaller (1–1.5 cm in diameter) and leaves abaxially densely whitish woolly. However, *S. laneana* is distinctly different from *S. costus* in its lanceolate phyllaries and two series of pappus. In fact, the above morphological characters of *S. laneana* are shared by *S. lyratifolia*. After examining the type material of both *S. lyratifolia* and *S. laneana*, we found no difference in these two taxa. During expeditions to southeastern Xizang, we collected more specimens of *S. lyratifolia* and confirmed that these two taxa are in fact the same species. Consequently *S. lyratifolia* should be treated as a new synonym of *S. laneana*.

**1. *Saussurea graminifolia*** Wallich ex Candolle (1838: 536). Type:—INDIA. Uttarakhand: Kumaon, *R. Blinkworth* in *Wallich 2911/21* (holotype G; isotypes E!, GH!, K!, LE!, M!, NY!, P!).

*Saussurea stafleuana* Lipschitz (1982: 181), **syn. nov.** Type:—NEPAL. Mutsang District: Dhaulagiri Himal, Below Marpha Peak between Yak pass and Dhampus Pass, 4267–4724 m, 5 Sept.–15 Oct. 1980, *Wendy Jones s. n.* (holotype: LE!).

**Additional specimens examined:**—BHUTAN. Kaug la, 4720 m, 28 September 1949, *Ludlow & Sherriff 17332* (BM); Marlung, Tsawpa, 4720 m, 14 July 1949, *Ludlow & Sherriff 19430* (BM). CHINA. Xizang: Nylam, 4500–4700 m, 9 September 2012, *FLPH Tibet Expedition 12-356* (PE). INDIA. Uttarakhand: Kumaon, 4270 m, *R. Strachey & J. E. Winterbottom 3*(K), Panjab: Kunawar, *J. R. Drummond 22083* (K); Panjab: Labrang, 19 September 1886, *J. R.*

*Drummond 22081* (K); Punjab: Sunguam, 18 September 1886, *J. R. Drummond 22082* (K); Tehri Garhwal: Gangdltari, 4270–4870 m, 1 September 1897, *J. S. Gamble 11* (K); Tehri Garhwal: Bamsor pass, 4270–4570 m, 26 August 1883, *J. F. Duthie 823* (K). NEPAL. Dolkha District: Yalung Kharka–Yalung La, 8 September 1983, *H. Ohba et al. 8351376* (BM); Dolpa District: Jengla west of Namdo, 5300 m, 25 August 1973, *Grey-Wilson & Phillips 717* (K); Gorkha District: Jargeng Khola, 2 July 1950, *D. G. Lowndes 1104* (BM); Manang District, Annapurna Himal, Sabche valley, 4700 m, 3 October 1969, *T. Wraber 36471* (K); Mustang district, Damodar kund, north of Muktinath, 4720 m, 31 July 1954, *Stainton, Sykes & Williams 2114* (A, BM); Mustang District: Taglung, South of the Tukucha, Kali Gandaki, 3660 m, 11 July 1954, *Stainton, Sykes & Williams 1735* (BM); Mustang district: Thorong La, east of Muktinath, 5120 m, 9 September 1977, *G. Miehe 647* (BM); Mustang District: Kali Gandaki, ESE Thini, 3960 m, 18 July 1977, *G. Miehe 218* (BM); Rukum District: East of Chalike Pahar, 4420 m, 2 August 1954, *Stainton, Sykes & Williams 3719* (A); Sankhuwasabha District: Arun valley, Wabak Khola, 12 August 1956, *J. D. A. Stainton 1336* (A, BM); Sankhuwasabha District: Barun Khola, 4800 m, 28 August 1981, *Grey-Wilson et al. 4293* (K).

**2. *Saussurea laneana*** Smith (1911: 74). Type:—INDIA. Sikkim: Na Tung, 24 August 1878, *Dungboo s. n.* (lectotype designated by Lipschitz 1966: K000250104!).

*Saussurea lyratifolia* Chen *et al.* (1981: 95), **syn. nov.** Type:—CHINA. Xizang: Bomi, Guxiang, in *Betula* forests, 3800 m, 20 Aug. 1965, *T. S. Ying & D. Y. Hong 1218 B* (holotype PE!; isotype PE!).

**Additional specimens examined:**—BHUTAN. Somana: 4370 m, 23 August 1971, *R. Bedi 948* (K). CHINA. Xizang: Bomi, Galongla Shan, 3900–4100m, 8 August 2009, *Y. S. Chen & Z. H. Wang 9324* (KUN, PE); Bomi, Galongla Shan, 4000 m, 6 September 1980, *Z. C. Ni et al. 1483* (PE), Galongla Shan, 3780 m, 19 September 2009, *FLPH Tibet Exped. 12-1594* (PE); Bomi, Guxiang, 4170 m, 2 August 1965, *T. S. Ying & D. Y. Hong 650828* (PE); Mêdog, Nage, 31 July 1974, *Qinghai-Xizang Exped. 74-3805* (KUN, PE), Mêdog, Galongla Shan, 4150 m, 14 August 1982, *S. Z. Cheng & B. S. Li 20* (PE). INDIA. Sikkim: Bhola, 4270 m, 28 July 1910, *W. W. Smith 3920* (syntype K); Changu, 3960 m, 8 September 1913, *R. E. Cooper 823* (A, BM, K); Changu, 3660 m, 6 November 1917, *G. H. Cave s. n.* (A, E); Changu, September–October 1914, *Ribu & Rhomoo 4549* (syntype E).

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## References

- Candolle, A.P. de (1810) Observations sur les plantes composées ou syngénèses (I). *Annales du Muséum National d’Histoire Naturelle* 16: 135–208.
- Candolle, A.P. de (1838) *Prodromus systematis naturalis regni vegetabilis*, vol. 6. Treuttel & Würtz, Paris, 687 pp.  
<http://dx.doi.org/10.5962/bhl.title.286>
- Chen, Y.L., Liang, S.Y. & Pan, K.Y. (1981) Taxa nova compositarum e flora Xizangensi (Tibetica). *Acta Phytotaxonomica Sinica* 19(1): 85–106.
- Falconer, H. (1841) Description of *Aucklandia*, a new genus of Compositae, supposed to be the Costus of Dioscorides. *The Annals and Magazine of Natural History* 6(39): 474–475.
- Grierson, A.J.C. & Springate, L.S. (2001) Compositae (Asteraceae). In: Grierson, A.J.C. & Long, D.G. (Eds.) *Flora of Bhutan*, vol. 2(3). Royal Botanic Garden Edinburgh & Royal Government of Bhutan, pp. 1397–1641.
- Hajra, P.K. (1995) Tribe Cardueae Cass. In: Hajra, P.K., Rao, R.R. & Singh, D.K. (Eds.) *Flora of India*, vol. 12. Botanical Survey of China, Calcutta, pp. 150–226.
- Handel-Mazzetti, H. (1937) Neue und bemerkenswerte chinesische Compositen, besonders aus dem Berliner Herbar. *Notizblatt des Botanischen Gartens und Museums zu Berlin-Dahlem* 13: 607–661.  
<http://dx.doi.org/10.2307/3994954>

- Kumar, S. & Singh, V. (2001) *Asteraceae of Sikkim*. Deep Publications, Dew Delhi, 209 pp.
- Lipschitz, S. (1961) Ad cognitionem generis *Saussurea* DC. fl. URSS. *Novosti Sistematiki Vysshikh Rastenii* 21: 369–381.
- Lipschitz, S. (1964) *Aucklandia* Falconer (Compositae). *Botanicheskii Zhurnal* 49: 130–132.
- Lipschitz, S. (1979) Genus *Saussurea* DC. (Asteraceae). Nauka, Leningrad, 281 pp. [In Russian and Latin]
- Lipschitz, S. (1982) *Saussurea stafleuana* Lipsch. (Asteraceae)—species nova ex India. *Novosti Sistematiki Vysshikh Rastenii* 19: 181–182.
- Raab-Straube, E. von (2003) Phylogenetic relationships in *Saussurea* (Compositae, Cardueae) sensu lato, inferred from morphological, ITS and *trnL-trnF* sequence data, with a synopsis of *Himalaiella* gen. nov., *Lipschitziella* and *Frolovia*. *Willdenowia* 33: 379–402.
- Schultz Bipontinus, C.H. (1846) Bemerkungen zu der Tribus der Cynareen Less. *Linnaea* 19: 321–336.
- Shi, Z. & Raab-Straube, E. von (2011) *Saussurea* Candolle. In: Wu, Z.Y. & Raven, P.H. (Eds.) *Flora of China*, vol. 20–21. Science Press, Beijing & Missouri Botanical Garden Press, St. Louis, pp. 56–149.
- Shih, C. & Jin, S.Y. (1999) *Saussurea* DC. In: Chen, Y.L. & Shih, C. (Eds.) *Flora Reipublicae Popularis Sinicae*, vol. 78(2). Science Press, Beijing, pp. 1–213. [In Chinese]
- Smith, W.W. (1911) Plantarum novarum in herbario Horti Regii Calcutensis cognitarum decas. *Journal and Proceedings of the Asiatic Society of Bengal* 7: 69–75.