

NEW COMBINATIONS IN THE GENUS JURINEA CASS. (CARDUEAE – ASTERACEAE)

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Abstract

Molecular evidence suggested that the *Saussurea* DC. (s. l.) was not a monophyletic genus. Number of small genera were splitted from *Saussurea* (s. l.) to make it monophyletic. However, recent molecular studies based on molecular evidences (Hyb. Seq data) revised generic boundaries of the subtribe Saussurinae (Cardueae – Asteraceae) which resulted in the merger of these small/ satellite genera with the genus *Jurinea* Cass. or *Dolomiaea* DC. Most of the taxa formerly treated under the genera such as *Himalaiella* and *Lipschitziella* are now transferred under the genus *Jurinea*. However, few taxa are still left which need new combination. In the present paper five new combinations in the genus *Jurinea* are proposed.

Key words: Carudeae, Phylogeny, *Saussurea*, *Jurinea*, New Combinations, Pakistan

The advent of 21st century saw a flood of papers on phylogenetic studies of various taxa of all levels on the basis of molecular data, which has completely revolutionized the traditional concept of taxonomic interpretation based on macro and micro morphological characters (Peer, 2019; Qaiser & Abid, 2021). The unravelling of phylogenetic relationship based on monophyletic concept is the main driving force for this reshuffling. A number of taxa not only at the lower level such as species or infraspecific taxa but also the higher categories including genera, tribes and families are either reshuffled or some established old taxa are merged on the basis of molecular data, sometimes even ignoring the apparant morphological characters. The largest family Asteraceae is no exception, has also gone/ still going on through this exercise as the molecular sequencing/ data is continuously pouring in. There are large number of papers dealing with the phylogeny of various groups of Asteraceae including Cardueae, Inuleae, Cichorieae (Karis *et al.* 1992; Häffner, 2000; Kita *et al.*, 2004; Kilian *et al.*, 2017). Based on the current taxonomic circumscription the family Asteraceae is divided into 16 subfamilies and 50 tribes (Susanna *et al.*, 2020)

While finalizing and publishing an account of the tribe Cardueae for Flora of Pakistan (Ghafoor *et al.*, 2019), we tried to adopt the most recent available information particularly dealing with the genera *Saussurea* DC., *Jurinea* Cass. and *Dolomiaea* DC. (Raab Straube, 2003; Shih & Raab-Straube, 2011; Chen & Raab-Straube, 2013) and accepted satellite genera such as *Frolovia* (Candolle) Lipschitz (1954), *Lipschitziella* Kamellin (1993) and newly described genera such as *Himalaiella* Raab Straube (2003) and *Shangwua* Wang *et al.*, (2013). Most of these genera were separated from the polyphyletic genus

Saussurea. However, just after the completion of Flora of Pakistan (Asteraceae – Cardueae) two comprehensive studies by Kasana *et al.* (2020) and Herrando-Moraira *et al.* (2020) revised the generic boundaries of *Saussurea* and its allied genera based on the morphological and molecular data resulting in the merger of smaller and substitute genera mentioned above either in *Saussurea*, *Dolomiaea* or *Jurinea*. Herrando-Moraira *et al.* (2020) treated newly described genera *Himalaiella* Raab Straube and *Shangwa* Wang *et al.* as congeneric with the genus *Jurinea* on the basis of molecular data (Hyb. Seq data).

The genus *Jurinea* Cass. was established by Cass. in 1821, distinguished from the related genera by its typical outer involucral bracts (spiny tipped, spreading bracts) and typical cypselas bearing a distinct umbo and a membranous crown around the base of pappus. The generic circumscription of *Jurinea* was broadened by Häffner & Hellwig (1999) and Häffner (2000) using morphological and molecular data. However the recent studies by Kasana *et al.* (2020) and Herrando-Moraina *et al.*, (2020) not only broadened its generic circumscription based on molecular data but also merged *Lipschitziella* Kamelin, *Himaliella* Raab-Straube, *Hyalochaete* Dittrich & Rech. f. and *Jurinella* Jaub. & Spach. In Flora of Pakistan (2019) most of the taxa treated under different satellite genera of *Saussurea* are now transferred either under *Jurinea* or *Dolomiaea*. The current taxonomic status of these combinations is also confirmed from POWO (Plants of the World Online), The Plant List and IPNI (International Plant Name Index). However, few taxa are still left that need the new combinations, based on the recent systematic and phylogenetic studies 5 new combinations in the genus *Jurinea* are proposed. Most of these taxa are distributed in Western Himalayas including Hindukush regions (Fig. 1).

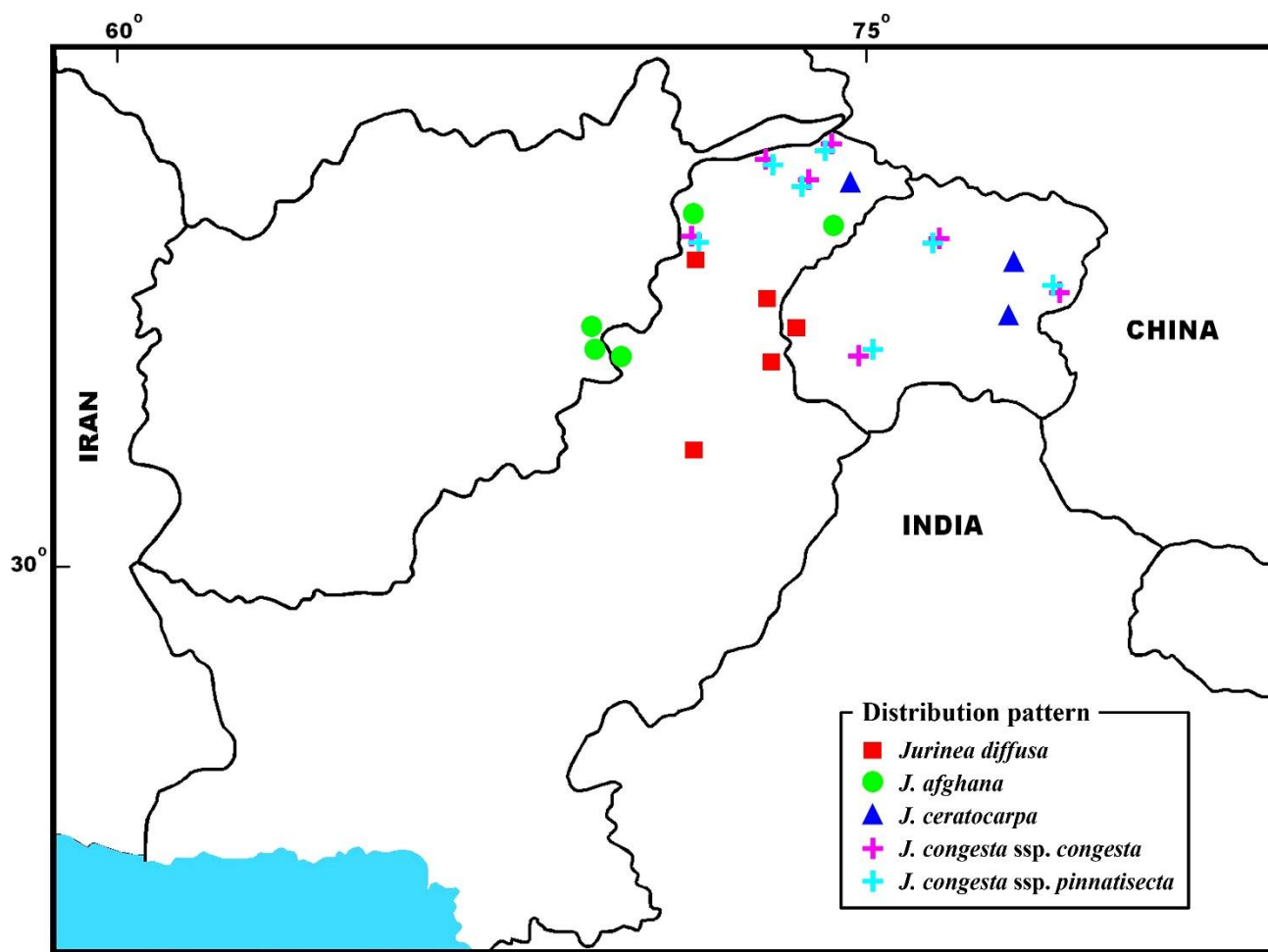


Fig. 1. Distribution of various taxa of *Jurinea*.

1. *Jurinea diffusa* (Lipsch.) R. Abid and M. Qaiser, comb. nov.

Saussurea diffusa Lipsch., Rod *Saussurea* 140. 1979.
Saussurea albescens var. *brachcephala* Franch in Bull. Herb. Boiss. 5(7), 540. 1891
Himalaiella diffusa (Lipsch.) A. Ghafoor, R. Abid & M. Qaiser, Pak. J. Bot. 51(4) 1438. 2019.

Type: Kashmir, Junction of Jehlum and Kishenganga (Neelum) rivers, Muzaffarabad, Sept. 1937, Falconer s. n. (K).

Distribution: Pakistan (Khyber Pakhtunkhwa) and India

2. *Jurinea afghana* (Lipsch.) R. Abid and M. Qaiser, comb. nov.

Saussurea afghana Lipsch. in Bol. Zurn. SSSR 60(10): 146. 1975.
Himalaiella afghana (Lipsch.) Raab-Straube in Willdenowia 33: 90. 2003.

Type: Afghanistan, Jai in Cederato Supra Kotgai in declivibus borealibw 2500, Freitag (holo LE, Iso, W, Herb. Freitag).

Distribution: E. Afghanistan and NW Pakistan.

3. *Jurinea congesta* (M. Qaiser, A. Ghafoor & R. Abid) Roohi Abid & M. Qaiser comb. nov.

Lipschitzziella congesta M. Qaiser, A. Ghafoor & R. Abid in Pak. J. Bot. 51(4): 1432. 2019; in Ali & Qaiser (eds.) Flora of Pakistan, Asteraceae (V) Cardueae, 223: 228-230. 2019. *Jurinea ceratocarpa* (Decne.) var. *depressa* Clarke ex Hook. f., Fl. Brit. Ind. 3: 378. 1881.

Type: Gilgit dist. 8 km from Babusar village on way to Babusar top, erect, 5.9.1988, S. Omer & M. Qaiser 2638 (KUH).

Distribution: Pakistan and India

4. *Jurinea congesta* (M. Qaiser, A. Ghafoor & R. Abid) var. *pinnatisecta* R. Abid & M. Qaiser, comb. nov.

Lipschitzziella congesta M. Qaiser, A. Ghafoor & R. Abid var. *pinnatisecta* R. Abid & M. Qaiser in Pak. J. Bot. 51(4): 1434. 2019; in Ali & Qaiser (eds.) Flora of Pakistan, Asteraceae (V) Cardueae, 223: 230. 2019.

Type: Baltistan Dist. Behind in grassland of Soesar, Deosai, stemless perennial herb up to 1.2-inch tall, purple heads, 12800 ft., infrequent of this area, August 2002, Jan Alam & Fazal Karim Ja 406 (KUH).

Distribution: Pakistan and Kashmir

5. *Jurinea ceratocarpa* (Decne.) Benth. ex C. B. Clarke
var. ***astorii*** R. Abid and M. Qaiser, **comb. nov.**

Lipschitzziella ceratocarpa (Decne.) Kamelin var. *astorii* R. Abid and M. Qaiser in Pak. J. Bot. 51(4): 1434. 2019; in Ali & Qaiser (eds.) Flora of Pakistan, Asteraceae (V) Cardueae, 223: 228. 2019.

Type: Pakistan: Astor: Rayat nullah, Kala Pani 23.8.2009, Ali Noor 2063 (KUH)

Distribution: Pakistan (Northern Areas) and Kashmir

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