Rediscovery of *Melanoseris bracteata* (Hook. f. & Thomson ex C.B. Clarke) N. Kilian (Asteraceae) in India with its nomenclatural notes and lectotypification of its basionym

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Abstract

Lactuca bracteata Hook.f. & Thomson ex C.B. Clarke, presently treated as *Melanoseris bracteata* (Hook.f. & Thomson ex C.B. Clarke) N. Kilian of Cichorieae–Asteraceae was described based on multiple specimens collected from Lachung valley of Sikkim Himalaya. Typification of *Lactuca bracteata* Hook.f. & Thomson ex C.B. Clarke is analyzed and the name is lectotypified following provisions of the present Code of nomenclature. Status of *Melanoseris bracteata* Hook. f. & Thomson is discussed. In India this species is rediscovered after 107 years from Lachen valley of Sikkim. Detailed description, field photographs, illustration, notes on distribution and ecology are provided. Its IUCN threat status in India is also proposed based on the present observation.

Key words: *Lactuca bracteata*, Asteraceae; Cichorieae, lectotypes IUCN status

INTRODUCTION

Melanoseris bracteata (Hook.f. & Thomson ex C.B. Clarke) N. Kilian belongs to Cichorieae of Asteraceae is a very rare species of India and has narrow distributional range in the country restricted only in the state of Sikkim. While collecting plant materials in high Himalayan mountain of North Sikkim to study the floristic diversity of Sikkim Himalaya authors came across few individuals in two populations of the species in Lachen and Zemu valley in two successive years 2016 and 2017. The population in Lachen valley consists of about 5 individuals, whereas, 7 individuals were observed at Zemu valley population.

Comprehensive examination of the Indian literature (Rao *et al.* 1988; Mamgain & Rao 1995; Maity 2005) and critical search of herbaria, like CAL, BSHC, CUH, K, E, BM, P, etc. revealed that the species has never been collected or recorded after 1909 from India, although the state Sikkim including the type locality Lachung is one of the most explored areas of the country. Apart from the type collections, only five specimens are available at CAL and all of them were collected during 1892 to 1909 and remained as the representation in Indian herbaria. While studying the floristic diversity of North Sikkim, authors rediscovered this species from Lachen valley as well as from India after more than a century.

The species was primarily described based on at least eight herbarium specimens – the syntypes, but no lectotype have been selected. Accordingly, in this article the lectotypification of the species has been made under the provisions of the Nomenclatural Code (McNeill *et al.* 2012).

The present study deals with the notes on rediscovery of the species giving details of the taxonomic description, distributional and threat status along with lectotypification of the basionym the *Lactuca bracteata* Hook.f. & Thomson ex C.B. Clarke

MATERIALS AND METHODS

Recent collections were made from the Lachen valley of North Sikkim in India. Specimens were studied both from the presently collected materials as well as previously collected specimens deposited at CAL. Photographs of habitat, plant habit and other floral parts were taken. Plant specimens were properly preserved and herbarium specimens were prepared following standard method (Lakshminarhasimhan 2012) and are deposited at CUH. A few specimens were kept unmounted for detailed study. Flowers were dissected under a stereo binocular microscope for detail characterization and illustrations were done for most of the plant parts. Photographs of floral parts were taken in Leica EZ4 HD stereo zoom microscope fitted with camera. All original materials of the name *Lactuca bracteata* Hook.f. & Thomson ex C.B. Clarke were examined in different herbaria, viz. CAL, P, K, BM, E either directly or through high resolution digital images for explanation of typification process. Pertinent literatures of both the names, *Lactuca bracteata* Hook. f. & Thomson ex C.B. Clarke and *Melanoseris bracteata* Hook.f. & Thomson were examined to elucidate the correct nomenclature and typification.

RESULTS

Rediscovery:

Melanoseris bracteata (Hook.f. & Thomson ex C. B. Clarke) N. Kilian was described from Lachung valley of Sikkim Himalaya based on the collections of Sir J. D. Hooker and Thomas Thomson in the year 1849. Later this species were reported from the neighbouring countries like Nepal, Bhutan and China. After type collections the species was recorded in India only for three times, by G.A. Gammie (three specimens), Smith and Cave (one specimen) and Lepcha collector (one specimen). Gammie collected his material from Lachung valley in 1892, whereas, Smith and Cave and ‘Lepcha collector’ collected the species from Lachen and Thangu respectively in 1909. All these collections are deposited at CAL. Apart from these materials one type specimen is also traced at CAL. The scrutiny of literature and herbarium specimen reveals that the species has never been collected and described after 1909 from India. Hence the present collection of the species forms its rediscovery after a long gap of about 107 years and proves its existence in the country. To date in India habitat of the species recorded only in Lachung and Lachen–Zemu–Thangu areas. Though the existence of the species confirmed in Lachen–Zemu–Thangu habitat, however, existence of Lachung population is yet to be confirmed.

Taxonomic treatment:

Melanoseris bracteata (Hook.f. & Thomson ex C.B.Clarke) N. Kilian, Fl. China 20-21: 225. 2011.

Basionym: *Lactuca bracteata* Hook.f. & Thomson ex C.B.Clarke Compos. Ind. 270. 1876; J. D. Hooker in J. D. Hooker, Fl. Brit. India 3: 409. 1881; Maimgain & Rao in Hajra *et al.*, Fl. India 12: 287. 1995.

Typus: “Hab. In Sikkim ad 8,000-10,000 ped. alt. detexit cl. J. D. Hooker”.

Melanoseris bracteata Hook.f. & Thomson in J.D. Hooker, Fl. Brit. India 3: 409. 1881; *nom. inval.*

Figure 1. *Melanoseris bracteata* : **A.** habit (inset: whole plant with basal leaves), **B.** Capitula in full bloom.

Figure 2. *Melanoseris bracteata* : **A.** habit (part), **B.** basal leaves, **C-E.** outer bracts, **F.** inner bract, **G.** floret, **H.** immature cypsel with pappus and closed floret.

Mulgedium bracteatum (Hook. f. & Thomson ex C.B. Clarke) C. Shih Acta Phytotax. Sin. 26(5): 390 (1988); Grierson & Springate in Grierson & Long, Fl. Bhutan 2(3): 1470. 2001.

Lectotypus (designated here): Sikkim, Lachung, 8–10000 ft (2400–3000 m), Oct.1, 1849, *Hooker & Thomson, s.n.*, K [K000250915, digital image seen]; *iso*– K [K000250913, K000250914, K000250916, digital images seen], E [E00387050, digital image seen]; P [P03732710, digital image seen]; BM [BM000035231, digital image seen]; CAL! (Acc. no. CAL257612).

Perennial, slender, erect, hispid or glandular hairy herb, to 1 m high; basal leaves ovate, elliptic, elliptic–ovate, or oblanceolate, 3.5–11 × 1–4 cm, semi–amplexicaul at base, dentate or denticulate along margin, acuminate at apex, sparsely glandular hairy; stem leaves lanceolate or oblanceolate, smaller than basal leaf, less dentate or entire along margin, acute or acuminate at apex; capitula many arranged in racemose or paniculate cyme, ligulate; heads to 1.5 cm long; involucre bracts in two rows; inner bracts lanceolate, 1–1.4 cm long, reddish, entire along margin, acute at apex; outer bracts lanceolate or elliptic ovate, smaller than inner, c 0.8 cm long, entire along margin, acute to acuminate at apex; ligule 18–30, pale mauve to blue or violet; cypselas ellipsoid with distinct beak, 5–10 mm, brownish; pappus uniseriate, white.

Phenology: Flowering: June–September. Fruiting: August–October.

Distribution : INDIA : Himalaya : Sikkim; NEPAL; BHUTAN; TIBET. [800–4000 m].

Habitat: Grows in open slopes in evergreen temperate to alpine forests, often amongst scrubs. Commonly associated with *Anaphalis margaritacea*, *Epilobium* sp., *Fragaria nubicola*, *Galium* sp., *Rhododendron thomsonii*, *Sarcococca hookeriana*, *Tussilago furfuracea*, etc.

Under proposed IUCN conservation status in India. Critically Endangered (CR). In India the species is endemic to Sikkim only with restricted distribution. Repeated exploration revealed that the species is presently growing in two small populations occupying two different localities with an extent of area about 2 km² having 5–6 individuals each. The AOO and EOO of the species is <10 km² and <100 km², respectively. The habitat is also facing tremendous anthropogenic hazards and severely fragmented. Considering this high risk situation we propose the IUCN conservation category Critically Endangered (CR D) for this species in India (IUCN Standards and Petitions Subcommittee 2016).

Specimen examined: Sikkim, Jakthang, 9–10000 ft (3000–3200 m), 27.09.2013, Dey 20749 [deposited at CUH]; Lachen, 8–10000 ft. (2400–3000 m), *Smith & Cave* 2433; Sikkim, Lachung, 8–10000 ft (2400–3000 m), Oct.1, 1849, *Hooker & Thomson, s.n.*, CAL, acc. no. CAL257612 [deposited at CAL].

Nomenclatural note:

Sir J.D. Hooker and Thomas Thomson proposed two names, viz. *Lactuca bracteata* and *Melanoseris bracteata* on same herbarium specimens collected by them in 1849 from Lachung valley of Sikkim, India. However, C.B. Clarke (1876) validated *Lactuca bracteata* Hook.f. & Thomson ex C.B. Clarke and remained silent about the other name. Along with the description of the species Clarke (1876) gave his source of knowledge of the species as “Hab. in Sikkim ad 8,000–10,000 ped. alt. detexit cl. J. D. Hook” but did not mention any Type. Later Kilian (in Zhu and Kilian, 2011) transferred the species to the genus *Melanoseris* as *Melanoseris bracteata* (Hook.f. & Thomson ex C.B. Clarke) N. Kilian.

The name *Melanoseris bracteata* Hook.f. & Thomson is still maintained as unresolved in The Plant List (www.theplantlist.org). However, it should be treated as an invalid name (*nom. inval.*) as referred in the IPNI (<http://www.ipni.org>). Importantly C.B. Clarke (1876) did not comment on *Melanoseris bracteata* Hook. f. & Thomson in his publication. Sir J.D. Hooker (1881) included it as a synonym, under *Lactuca bracteata* as “*Melanoseris bracteata*, Herb. Ind. Or. H. f. & T.”. This is not a validly published name under Art. 36.1(c) of ICN (McNeill *et al.* 2012) and hence it is nomenclaturally invalid (“*nom. inval.*”). Moreover, it is not a name at all as not accepted by any one, therefore, not even nomen nudum (Art. 38; McNeill *et al.* 2012).

Typification of the name *Lactuca bracteata* Hook.f. & Thomson ex C.B. Clarke

C.B. Clarke (1876) validated the name *Lactuca bracteata* Hook. f. & Thomson ex C.B. Clarke, originally proposed by Sir J. D. Hooker and Thomas Thomson based on herbarium specimens collected from Lachung valley of north Sikkim, India. Clarke in his description indicated the source of the species as “Hab. In Sikkim ad 8,000-10,000 ped. alt. detexit cl. J. D. Hook”. Though there is no word “Type” anywhere in Clarke’s account, however, he intended to provide information on where the species grew and what specimens existed or by whom it was collected. Till date eight herbarium specimens representing original materials of the species have been traced in different herbaria: four at K (K000250913, K000250914, K000250915, K000250916), one at E (E00387050), one at P (P03732710), one at BM (BM000035231) and one at CAL (Acc. no. CAL257612) which constitute syntypes. As no specimen were indicated as “Type”, the authors intended to select a Lectotype in accordance with Art. 9.2, 9.11 & 9.12 of The International Code of Nomenclature for Algae, Fungi and Plants (McNeill *et al.* 2012. Among all the specimen the specimen of Kew i. e. K000250915 is found a suitable one and has been chosen and designated here as the lectotype of the name *Lactuca bracteata* Hook. f. & Thomson ex C.B. Clarke in accordance with Art. 9.2, 9.11.

CONCLUSION

Melanoseris bracteata (Hook.f. & Thomson ex C.B. Clarke) N. Kilian was described (as *Lactuca bracteata* Hook.f. & Thomson ex C.B. Clarke) based on multiple specimens (syntypes) collected from North Sikkim. Until now, eight herbarium specimens have been traced in different world herbaria including CAL. Based on the present findings necessary lectotypification has been accomplished to complete the taxonomic account of the species. *M. bracteata* is a rare plant in India and possibly in other parts of the world too. The rediscovery of the species in Sikkim is worth mentioning as it proves the existence of the taxon in India. In India it grows only in two places namely Lachung, the type locality and Lachen-Zemu-Thangu area of North Sikkim district. Both the areas are facing ruthless habitat fragmentation due to tremendous anthropogenic activities like building constructions, roadways construction and overall massive tourism pressure. Though part of Lachen-Zemu-Thangu area is now under Kanchenjunga Biosphere Reserve, however, the village areas of this region and entire Lachung still unprotected. Both the places are rigorously explored by several institutes including Botanical Survey of India, however, failed to relocate the habitat of the species in the type locality. As part of the present endeavor, we could able to relocate the species in the Lachen and Zemu valleys. Presently Forests, Environment & Wildlife Management Department, Government of Sikkim takes initiative to protect the plant diversity of these regions and hopefully these populations will survive. The necessary lectotypification of the name following McNeill *et al.* (2012; Art. 9.2, 9.11 & 9.12) completes the taxonomic circumscription of the species.

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