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Short Communication: *Cremanthodium indicum* (Asteraceae, Senecioneae), a new species from the Eastern Himalaya, India

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Abstract. Borah D, Singh RK, Thungon LT. 2021. Short Communication: *Cremanthodium indicum* (Asteraceae, Senecioneae), a new species from the Eastern Himalaya, India. *Biodiversitas* 22: 1268-1272. *Cremanthodium indicum* D.Borah, R.Kr. Singh & Thungon (Asteraceae, Senecioneae), a new species from Eastern Himalayan state Arunachal Pradesh, India is described and illustrated. The new species is allied to *Cremanthodium nobile* (Franch.) Diels ex H.Lév. in having elliptic-obovate basal leaves, solitary, nodding capitula and hemispheric involucre, but differs by densely pale yellow tomentose stem, stem leaves 5–9, 1.6–2.1 cm distant, outer phyllaries 2.3–2.8 mm wide, inner phyllaries elliptic, 3–5 mm wide, apex acute, ray lamina creamy, oblong, 2–2.3 cm long, apex truncate, distinctly 3-dentate, ray tube 1.5–2 mm long, tubular florets creamy, 8–9 mm long and pappus 6–8 mm long.

Keywords: Alpine, *Cremanthodium nobile*, Himalaya, novelty, Penga-Teng Tso Lake, Tawang District

INTRODUCTION

Cremanthodium Benth. (Asteraceae, Senecioneae) is an alpine genus distributed in the Sino-Himalayan region with a total of 78 recognized species (POWO 2019). Around half of the species are endemic to China (Wang et al. 2015). In India, it is represented by 16 species and 1 subspecies (Hajra et al. 1995; Karthikeyan et al. 2009). While working on the floristic diversity of Eastern Himalayan state Arunachal Pradesh, India (Borah et al. 2019; 2020a, b, c, d, e, f), an unidentifiable and remarkable species of *Cremanthodium* was collected and photographed from alpine region of Tawang District at 4100 m altitude in August 2017. Detailed study of *Cremanthodium* species of India and adjoining countries, including protologues, type specimens, other herbarium specimens and relevant taxonomic literature (Good 1929; Hajra et al. 1995; Liu and Illarionova 2011; Wang et al. 2015; 2016a, b, c, d, e, f; 2017a, b; 2018a, b; 2019; Chen and Xu 2016; Fei et al. 2019) proved this to be a new species hitherto unknown to science, which is described here as a novelty. This new species was collected again from the same locality in September 2020.

MATERIAL AND METHODS

The new species of *Cremanthodium* was collected from Arunachal Pradesh, eastern Himalayan state of India during plant collection trip in the year 2017 and 2020. This species was growing along the banks of Penga-Teng Tso Lake, Tawang District at 4100 m altitude. The collected

specimens was processed using standard herbarium methods and voucher type specimens were deposited in CAL and ASSAM. Morphological observations and measurements were made on both freshly collected and dried specimens. The micromorphological characters were studied with a stereomicroscope and was compared with the protologues of reported *Cremanthodium* species of India and adjoining countries and digital images of type specimens housed at different herbaria, as well as actual herbarium sheets housed at ASSAM, BSD, and CAL. The number of mature individuals of the new species in the type locality was also recorded for the conservation status as per IUCN (2019). The new species *Cremanthodium indicum* D.Borah, R.Kr.Singh & Thungon is allied to *Cremanthodium nobile* (Franch.) Diels ex H.Lév. in having elliptic-obovate basal leaves, solitary, nodding capitula and hemispheric involucre, but differs in vegetative and floral characters as mentioned in diagnosis.

RESULTS AND DISCUSSION

Taxonomic treatment

Cremanthodium indicum D.Borah, R.Kr.Singh & Thungon, *sp. nov.* (Figure 1-3)

Type: India, Arunachal Pradesh, Tawang District, Penga-Teng Tso Lake, 4100 m, 24 August 2017, L.T. Thungon & D. Borah 98651 (holotype CAL; isotypes ASSAM).

Diagnosis: The new species superficially resembles *Cremanthodium nobile* (Franch.) Diels ex H.Lév. in having elliptic-obovate basal leaves, solitary, nodding capitula and

hemispheric involucre, but differs by densely pale yellow tomentose stem (versus densely purplish-black pilose), stem leaves 5–9, 1.6–2.1 cm distant (versus 2–5, 4.2–7.5 cm), outer phyllaries 2.3–2.8 mm wide (versus 3–4 mm), inner phyllaries elliptic, 3–5 mm wide, apex acute (versus broadly oblong, 5–8 mm, acuminate), ray lamina creamy,

oblong, 2–2.3 cm long, apex truncate, distinctly 3-dentate (versus bright yellow, narrowly lanceolate or narrowly elliptic, 2.5–3.5 cm, acuminate or acute, shallowly 3-denticulate), ray tube 1.5–2 mm long (versus 3–3.5 mm), tubular florets creamy, 8–9 mm long (versus bright yellow, 5–6 mm) and pappus 6–8 mm long (versus 3.5–4 mm).



Figure 1. *Cremanthodium indicum* D.Borah, R.Kr. Singh & Thungon. A. Habitat, B. Habit, C. Capitula, D. Front view of Capitula, E. Back view of Capitula.



Figure 2. *Cremanthodium indicum*. A. Outer phyllaries, B. Inner phyllaries, C. Ray florets, D. Tubular florets.

Description: Perennial herb, 16–24 cm tall. Roots numerous, stout, fleshy; rootlets fibrous. Stem solitary, erect, 4–5 mm in diameter, densely pale yellow tomentose throughout. Basal leaves petiolate; petioles 1.5–4.5 cm long, pale yellow pubescent, winged; wings entire, margins ciliate; leaf blades elliptic-obovate, 2–6 × 1–3 cm, apex acute-obtuse or rounded, base attenuate, margins ciliate, entire or shallowly crenate, adaxially glabrous, abaxially pubescent on lateral veins; lateral veins 5–6 pairs. Stem leaves 5–9, sessile; the lowest one like basal leaf, base amplexicaul; the middle and distal ones smaller, lanceolate,

margin entire, apex acute. Capitula solitary, nodding. Involucre hemispheric, 1.5–1.7 × 2.5–3.3 cm, outside purplish pubescent; phyllaries 12–14 in 2 rows; outer phyllaries lanceolate, 12–15 × 2.3–2.8 mm, light green with purplish tinge, purplish pubescent, margins purplish ciliate, apex acuminate; inner phyllaries elliptic, 12–14 × 3–5 mm, light green with purplish tinge, purplish pubescent, margins purplish ciliate, apex acuminate. Ray florets creamy, 12–14; lamina oblong, 2–2.3 × 0.5–0.7 cm, apex truncate, distinctly 3-dentate; tube 1.5–2 mm long. Tubular florets numerous, creamy, 8–9 mm long; tube 2–2.5 mm long;

limb 6–6.5 mm long; style 8–9 mm long; style branches creamy. Achenes obovoid, 2.5–3.5 mm long. Pappus creamy or pale white, 6–8 mm long.

Phenology: Flowering from July to August and fruiting from August to September.

Distribution: The new species is apparently endemic to Tawang District of Arunachal Pradesh state, India.

Paratypes: India, Arunachal Pradesh, Tawang District, Penga-Teng Tso Lake, 4100 m, 5 September 2020, *L.T. Thungon & D. Borah 1784* (ASSAM).

Etymology: The specific epithet '*indicum*' refers to the country of origin India.



Figure 3. Herbarium specimen of *Cremanthodium indica*

Habitat: *Cremanthodium indicum* grows in boggy soil among mosses along the banks of alpine Lake in association with *Bergenia ciliata* (Haw.) Sternb., *Bistorta vivipara* (L.) Delarbre, *Cirsium eriophoroides* (Hook.f.) Petr., *Cyananthus pedunculatus* C.B. Clarke, *Jacobaea raphanifolia* (Wall. ex DC.) B. Nord., *Pedicularis* spp., *Saxifraga hispidula* D. Don, *Swertia* spp., grasses and sedges. Apart from *Cremanthodium indicum*, other species of this genus recorded from this area are *Cremanthodium conaense* S.W. Liu, *Cremanthodium oblanciligulatum* L. Wang, C. Ren & Q.E. Yang (ined., in press) and *Cremanthodium palmatum* Benth.

Conservation status: The new species *Cremanthodium indicum* is known from type locality, Penga-Teng Tso Lake, Tawang District, Arunachal Pradesh, India. During botanical explorations trips in the year 2017 and 2020, about 270 mature individuals were recorded. Extent of occurrence is about 3 km² and area of occupancy is about 1 km². Natural disasters and anthropogenic threats have been noticed for this species around the lake. Based on its limited range distribution and number of mature individuals, it is provisionally assessed as critically endangered according to the criteria B1 and B2 of the IUCN (2019) guidelines.

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