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Rediscovery of *Senecio kundaicus* (Asteraceae), a critically endangered and stenoendemic species from Nilgiri Biosphere Reserve, India

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भारत में नीलगिरी जैव संरक्षित क्षेत्र से एक अति संकटाग्रस्त एवं स्टेनोएन्डेमिक प्रजाति *सेनेसिओ कुंडैकस* (एस्टेरेसी) का पुनः अन्वेषण

एम. प्रेम कुमार, बी. कार्थिक, एम. मुरुगेसन एवं आर. मणिकंदन

सारांश

एक अति संकटाग्रस्त एवं स्टेनोएन्डेमिक प्रजाति *सेनेसिओ कुंडैकस* सी. ई. सी. फिश्च. (एस्टेरेसी) का पुनः अन्वेषण भारत में तमिलनाडू के नीलगिरी जैव संरक्षित क्षेत्र अंतर्गत मुकुर्थी राष्ट्रीय उद्यान से प्राप्त संग्रह के आधार पर किया गया है। 93 वर्ष पूर्व 1928 में पी.वी. मयूरान्थम द्वारा नीलगिरी में कुंडाहस से इसका संग्रह किया गया था। इस आलेख में इसके सुगम पहचान हेतु इसका नामकरण, विस्तृत वर्णन, संकट स्थिति एवं फोटो प्लेट प्रदान किए गए हैं।

ABSTRACT

Senecio kundaicus C.E.C. Fisch. (Asteraceae), a critically endangered and stenoendemic species has been rediscovered from Mukurthi National Park, a part of Nilgiri Biosphere Reserve, Tamil Nadu, India, after its type collection from Kundahs in Nilgiris by P.V. Mayuranathan in 1928, after a gap of 93 years. Nomenclature, detailed description, threat status and photo plate of the species are provided here for its easy identification.

Keywords : Mukurthi National Park, Nilgiris, Recollection, Southern Western Ghats, Tamil Nadu

INTRODUCTION

Senecio L. (Asteraceae) is one of the largest genera of the tribe Senecioneae (Calvo & al., 2015). It is considered to be the most primitive genus in the entire family with high level of polymorphism (Mathur 1995). According to Plants of the World Online database, the genus comprises 1429 species in the world (POWO 2021), and its species occur in almost all kinds of habitats, ranging from aquatic to desert, low altitudes to alpine regions and from arctic regions to tropical areas. This cosmopolitan genus generally includes annual or perennial herbs, some shrubs or vines, and rarely trees or epiphytes (Pelser 2007). In India, the genus is represented by 53 taxa, including 47 species and 6 varieties (Karthikeyan & al., 2020), of which 21 taxa are endemic to the country (Singh & al., 2015). In Tamil Nadu, the genus is represented by 11 species (Narasimhan & Irwin, 2021), of which four species, namely *S. kundaicus* C.E.C. Fisch., *S. lawsonii* Gamble, *S. lessingianus* C.B. Clarke and *S. multiceps* N.P. Balakr. are strictly endemic to Nilgiris (Singh & al., 2015).

P.V. Mayuranathan, former Botanical Assistant of Indian Museum, Madras (now Chennai) collected a specimen of *Senecio* from Kundahs in Nilgiris during September 1928, and doubtfully identified/annotated it as "*Senecio neelgherryanus*, DC. "new.? var." on the herbarium sheet. Later, Fischer (1939) determined the correct identity of this specimen and described it as a new species, *Senecio kundaicus*. This species was known only by its type collection and since then it has never been collected or reported elsewhere (Ahmedullah 1993; Srivastava & al., 2015). However, this species has been included in various publications merely based on the type collection and variously categorised as 'Rare and Threatened' (Ahmedullah & Nayar, 1987), 'Rare' (Chandrasekaran 1987; Mathur 1995), 'Endangered' (Vivekananthan 1987; Vivekananthan & al., 1997; Mohanan & Daniel, 2002;

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Murthy & Benjamin, 2004) and 'Threatened' (Walter & Gillett, 1998; Rao & al., 2003).

During a botanical exploration to Mukurthi National Park in October 2021, an interesting species of *Senecio* in a small population of six individuals was collected. After critical study of the collected specimens, perusal of relevant literature (Sebastine 1962; Chandrasekaran 1987; Rao & al., 1988; Mathur 1995; Karthikeyan & al., 2009, 2020; Srivastava & al., 2015; Narasimhan & Irwin, 2021) and comparison with herbarium specimens of other allied species housed at MH, CAL and the digital images of specimens in Kew Herbarium Catalogue, the specimens were identified as *Senecio kundaicus,* a poorly known, critically endangered and stenoendemic species thus the present collection of the species forms a rediscovery after a gap of 93 years. Therefore, nomenclature, detailed description, photo plate and a brief taxonomic note comparing with its allied species, *S. wightii* Benth. ex C.B. Clarke are provided here for its easy identification.

TAXONOMIC TREATMENT

Senecio kundaicus C.E.C. Fisch., Bull. Misc. Inform. Kew: 45. 1940; Sebastine, Bull. Bot. Surv. India 4: 219. 1962; V. Chandras. in A.N. Henry & al., Fl. Tamil Nadu 2: 47. 1987; R.R. Rao & al., Fl. Ind. Enum. Asterac.: 69. 1988; Uniyal in Hajra & al., Fl. India 13: 262. 1995; Karthik. & al. Fl. Pl. India 1: 272. 2009; Karthik. & al. in A.A. Mao & S.S. Dash, Fl. Pl. India, Annot. Checkl. 1: 788. 2020; D. Naras. & S.J. Irwin., Fl. Pl. Tamil Nadu: 196. 2021. **(Plate 1)**

Type: INDIA, Tamil Nadu, Nilgiris District, Nilgiri Hills on the Kundahs, Sept. 1928, *P.V. Mayuranathan s.n.* (K [K000852210, digital image!]).

Perennial herb, 30–90 cm high. Stem erect, unbranched except near inflorescence, grooved, ribbed, glabrous or sparsely minutely puberulous; internodes 3–5 cm long. Leaves sessile, simple, alternate-spiral, linear-oblong, 4–12 × 1–2.2 cm, narrowed, semi-amplexicaul at base with rounded auricles, distantly, irregularly, minutely toothed at margins, obtuse with an apicula at apex, glabrous; primary veins 10–12 pairs, obscure (grooved when fresh) on adaxial surface, prominent on abaxial surface; terminal leaves smaller, acute or subacute at apex, becoming bract-like towards heads. Inflorescence axillary or terminal corymb, branched; peduncles up to 5 cm long. Capitula 3–5, heterogamous, 4–7.5 × 2–5 mm, glabrous. Involucral bracts 25–32 (including a few smaller ones at base), linear, 4–8 mm long, scarious at margins, obtuse or subacute at apex. Receptacle flat, naked, smooth. Ray florets 8–13, one-whorled, 7–12 mm long; tubular portion 3–4 mm long; ligule oblong, 4–5 × 2–3 mm, glabrous, yellow, shortly 3-denticulate, usually 3-veined, with central one forking near apex, rarely 4-veined. Pistil 3–4 mm long, glabrous; style slender, bifid; stigmatic lobes 0.8–1 mm. Disc florets 35–70, tubular, 5–6 mm long, 5-lobed; lobes ovate, acute-acuminate at apex, apically hairy outside, yellow. Androecium 2–2.5 mm long; stamens 5, syngenesious; filaments 1–1.5 mm long, slightly swollen near anther base; anthers basifixed, linear, 0.8–1.5 mm long, acute-obtuse at apex. Cypsela oblongoid, 1–4 mm long, slightly tapering towards apex, truncate at ends, distinctly 10–12-ribbed, glabrous, brown; pappus many, 2-seriate, 2–4 mm long, antrorsely barbellate, white.

Phenology: August–December.

Distribution: INDIA: Tamil Nadu, Nilgiris District, Mukurthi National Park, on way to Bangitappal. Endemic to upper Nilgiris of Tamil Nadu.

Habitat & Ecology: It grows in moist localities in high altitude grasslands, between 2000 and 2500 m in association with *Anaphalis leptophylla* DC., *Eriocaulon* spp., *Eulalia phaeothrix* (Hack.) Kuntze, *Fimbristylis kingii* Gamble ex Boeckeler, *Habenaria cephalotes* Lindl., *Impatiens clavicornu* Turcz., *I. pendula* B. Heyne ex Wight & Arn., *Ischaemum indicum* (Houtt.) Merr., *Leucas suffruticosa* Benth., *Pedicularis zeylanica* Benth., *Senecio wightii* (DC.) Benth. ex C.B. Clarke and *Tripogon bromoides* Roth.

Specimens examined: INDIA, Tamil Nadu: Nilgiris District, Mukurthi National Park, on way to Bangitappal, 11°15'29" N, 76°31'32" E, ± 2200 m, 21.10.2021, *M. Premkumar & M. Murugesan* 149613 (MH).

Conservation Status: During the present investigation, only six matured individuals were observed in Bangitappal, covering about 2 km^2 geographical area. Therefore, it is provisionally assessed here as Critically Endangered (CR) according to the guidelines of IUCN Red List Categories and Criteria (IUCN 2019). Hence, this species requires urgent need of conservation by means of *ex situ* conservation measures to prevent it from extinction.

Notes: *Senecio kundaicus* C.E.C. Fisch. closely resembles *S. wightii* (DC.) C.B. Clarke but differs from it by having sparsely puberulous stem (vs glabrous); leaves linear-oblong with obtuse apex (vs oblong-lanceolate with acute apex), minutely distantly toothed at margins (vs serrate at margins); involucral bracts 25–32, equal (vs 15–20, unequal); ligulate florets with 4–5 mm long tubular portion (vs 1–2 mm long tubular portion) and cypsela distinctly 10–12-ribbed (vs indistinctly ribbed).

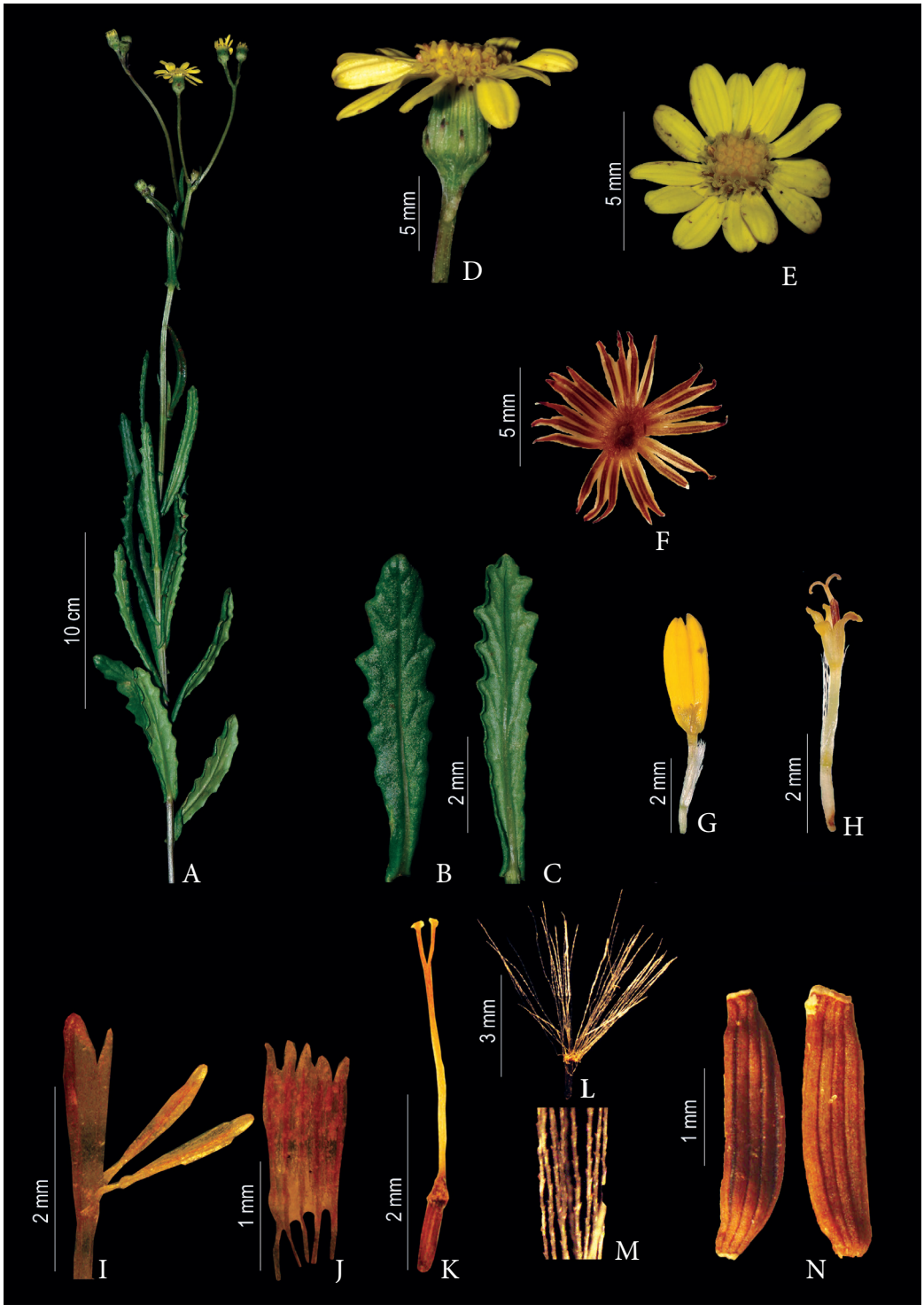

Plate 1. *Senecio kundaicus* C.E.C. Fisch.: **A**. Habit; **B**. Leaf adaxial view; **C**. Leaf abaxial view; **D**. Side view of capitulum; **E**. Top view of capitulum; **F**. Involucral bracts; **G**. Ray floret; **H**. Disc floret; **I**. Anther close-up; **J**. Androecium; **K**. Pistil; **L**. Cypsela with pappus; **M**. Pappus (close-up); **N**. Cypselae without pappus.

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