

Rediscovery of *Impatiens laticornis* C.E.C. Fisch. (Balsaminaceae), a stenoendemic and critically endangered species from Nilgiri Biosphere Reserve, southern India

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दक्षिण भारत में नीलगिरी जैव संरक्षित क्षेत्र से प्राप्त इमपेशिएंस लेटिकोर्निस सी.ई.सी. फिश. (बालसमिनेसी) नामक एक स्टेनोएन्डेमिक एवं अति संकटाग्रस्त प्रजाति का पुनः अन्वेषण

आर. थरानी, एम. मुरुगेशन, वी. रविचंद्रन, बी. कार्थिक एवं वी. अनुसुबा

सारांश

इमपेशिएंस लेटिकोर्निस सी.ई.सी. फिश. (बालसमिनेसी) नामक एक स्टेनोएन्डेमिक एवं अति संकटाग्रस्त जाति का पुनः अन्वेषण 92 वर्ष बाद भारत में तमिलनाडू के नीलगिरी जैव संरक्षित क्षेत्र के अंतर्गत मुकुर्थी राष्ट्रीय उद्यान से इसके विशेष निवासस्थल से किया गया है। इसके प्ररूप का संग्रहण 1929 में एडवर्ड बार्नेस द्वारा किया गया था। भविष्य संदर्भ तथा सुगम पहचान हेतु सचित्र वर्णन तथा फोटो प्लेट के साथ साथ नामकरण संबंधी व्याख्या, ताजे पादप सामग्रियों, पुष्पण समय एवं प्राप्ति विस्तार का वास्तविक प्रक्षेप का भी विवरण प्रदान किया गया है।

ABSTRACT

Impatiens laticornis C.E.C. Fisch. (Balsaminaceae), a stenoendemic and critically endangered species has been rediscovered from the type locality, Mukurthi National Park, a part of Nilgiri Biosphere Reserve in Nilgiris district, Tamil Nadu, India after a gap of 92 years. The type was collected by Edward Barnes in 1929. Nomenclatural citation, detailed description based on fresh plant materials, phenology and notes on its actual range of distribution are provided here along with illustration and colour photo plate, for its easy identification and future reference.

Keywords: Edward Barnes, Mukurthi National Park, Nilgiri Mountains, Tamil Nadu, Western Ghats

INTRODUCTION

The genus *Impatiens* L. (Balsaminaceae) is one of the largest genera of flowering plants with 1067 accepted species, and widely distributed in the tropical and subtropical regions of the Old World as well as in the northern temperate regions (POWO, 2021) with maximum concentration in tropical and subtropical montane forests of Southeast Asia (Stevens, 2001; Richard & al., 2021). The genus is characterized by the presence of zygomorphic flowers with remarkable diversity in its morphology and flower colour (Yuan & al., 2004; Richard & al., 2021).

In India, *Impatiens* is mainly found in Western Ghats, the Eastern Himalayas and Northeastern states, with disjunctive distribution of more than 100 species in each hotspot (Bhaskar, 2012; Gogoi & al., 2020).

The genus is represented by c. 280 species in India, of which approximately 210 species are endemic, and c. 130 species occur in Western Ghats, of which 124 are endemic, exhibiting 90% of endemism (Vivekananthan & al., 1997; Bhaskar, 2012; Gogoi & al., 2020). About 85 species of *Impatiens* that occur in the Western Ghats have become endangered due to their susceptible habitat (IUCN, 2019). Most of the species of *Impatiens* cannot tolerate to grow under severe drought climatic conditions or prolonged exposure to direct sunlight as a result the species of the genus are usually confined to margin of streams, waterside boulders, wet rocks and wet montane forests (Gogoi, & al., 2020). Western Ghats is considered as one of the richest areas of *Impatiens* diversity, and Western Ghats along with Sri Lanka, the hotspot region is home for almost all the scapigerous balsams of the world (Bhaskar, 2012; Chhabra & al., 2016). During the recent past several new *Impatiens* species have been

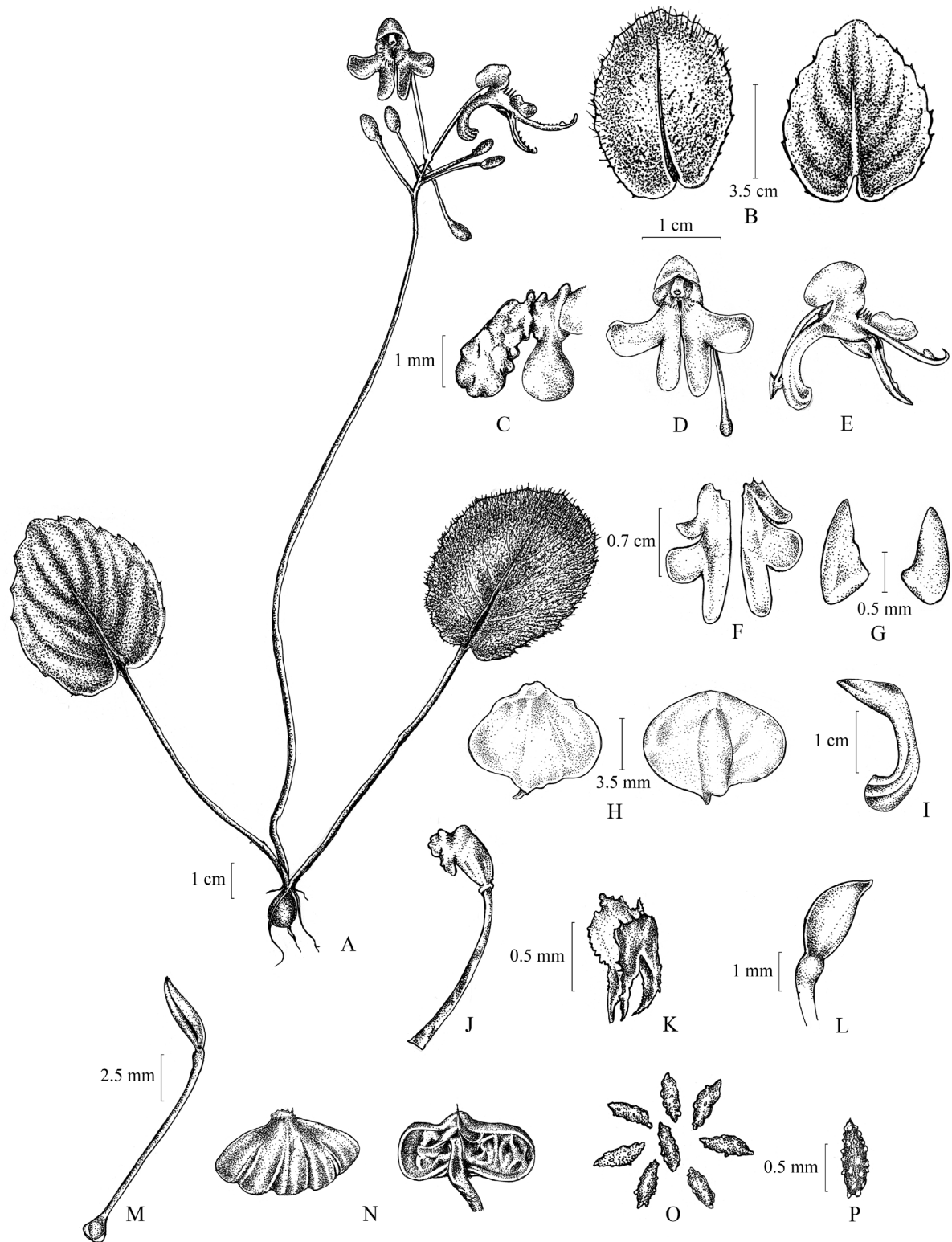


Fig. 1. *Impatiens laticornis* C.E.C. Fisch.: **A.** Habit; **B.** Leaf adaxial surface & Leaf abaxial surface; **C.** Tuber **D.** Flower front view; **E.** Flower side view; **F.** Lateral united petal; **G.** Lateral sepal; **H.** Dorsal petal inner & outer; **I.** Lower sepal with spur; **J.** Stamens with pedicel; **K.** Stamens; **L.** Ovary; **M.** Fruit; **N.** Dehiscent fruit front view & Dehiscent fruit outer view; **O.** Seeds; **P.** Seed close-up.

described by various authors from different parts of the Western Ghats.

The Nilgiris district, a part of Nilgiri Biosphere Reserve of the Western Ghats is home for c. 35 species of *Impatiens*, of which 24 are strictly endemic to the region (Bhaskar, 2012; Chhabra & al., 2016). During a recent botanical exploration (on 9th August 2021) to Nilgiri Biosphere Reserve (NBR), the present authors have collected a delicate scapigerous *Impatiens* from dripping rocky localities of the high altitude montane grasslands of Mukurthi National Park, on way to Bangitappal from upper Bhavani, Nilgiris district, Tamil Nadu. A careful observation of fresh collection along with protologue and other relevant literature (Fischer, 1930; Vivekananthan & al., 1997; Bhaskar 2012), and also the type housed at K (K000675533, image!) revealed that this species is *Impatiens laticornis* C.E.C. Fisch., an endemic and endangered species, which has never been collected after its type collection from the type locality or anywhere else. Hence, the present collection forms the rediscovery of this species after its type collection by E. Barnes in 1929, after a lapse of 92 years.

TAXONOMIC TREATMENT

Impatiens laticornis C.E.C. Fisch., Bull. Misc. Inform. Kew 1930: 154. 1930 & in Gamble, Fl. Madras: 1870. 1936; Fyson, Fl. South Indian Hill Stat. 1: 84, t. 59. 1932; Vajr. in N.C. Nair & A.N. Henry, Fl. Tamil Nadu 1: 54. 1983; Vivek. & al., Fl. India 4: 168. 1997; Bhaskar, Taxon. Monogr. *Impatiens* W. Ghats: 115. 2012. (Fig. 1 & 2)

Type: INDIA, Tamil Nadu: Nilgiris District, Kundahs, 18.09.1929, E. Barnes B. 41 (K [K000675533, image!])

Herb, lithophytic, scapigerous, erect, acaulescent, up to 18 cm high, stoloniferous with tuberous rhizome; tubers usually solitary or sometimes 2, globose or subglobose, 2.5–4.5 × 2.5–5.5 mm, white with dense red dots. Leaves 1 or 2, rarely 3, radical, orbicular or suborbicular or broadly ovate, 2.5–7 × 2–5.5 cm, cordate at base, base sometimes overlapping, serrate or serrulate or crenate to distantly crenate at margins with a short, stout reddish hair at each crenature/serrature, rounded or obtuse at apex, densely strigose-hairy on adaxial surface, usually glabrous and reddish on abaxial surface, sometimes greenish with reddish veins; lateral veins 4–7 on either side, flabellate, 1 or 2 pairs ascending at base; petioles up to 10 cm long, glabrous, reddish-brown or purplish-red. Inflorescence a simple scapose raceme, unbranched; scape solitary or rarely 2 per plant, 6–19 cm long, slender, purplish-red or pale pink with white streaks, 3–11 flowers clustered at apex, glabrous; bracts semi-amplexicaule, concave, oblong-ovate, 2.5–5.5 mm long, obtuse or rarely acute at apex, reddish-brown or

purplish-red with green streaks, persistent. Flowers deep pink to light pink or pinkish-violet to mauve or whitish-pink or white, 1.8–2.3 cm long, with white or yellow or orange or reddish glandular hairs densely to sparsely near the centre of united petals; pedicels reddish-brown or purplish-red, 1–3 cm long, terete, straight, glabrous. Lateral sepals ovate-oblong or subcordate, concave, 3.5–4 × 2–3.5 mm, purplish-red or white with pinkish streaks, truncate at base, rounded or obtuse or subacute at apex. Lower sepal broadly elliptic, 2.2–2.7 mm across, saccate, spurred; spur pinkish or whitish pink or white, pendant, 1–1.5 cm long, 1.5–3.5 mm across, channelled above, curved, flattened and 2-lobed at base, glabrous, usually prominently pink-veined at base; veins inconspicuous on maturity. Standard petal pinkish-white with red stripes, elliptic-suborbicular, 5–9 × 5–11 mm, concave, rounded or obtuse at apex, dorsally 1-keeled. Lateral united petal 3-lobed; basal lobe small, nearly half as middle lobe, ovate, pinkish at top, whitish with white or orange glandular hairs at base, 2.5–3 mm long, rounded at apex; middle lobe pink, oblong or broadly oblong, 4.5–6 × 5–6 mm, rounded or obtuse at apex; distal lobe pink, oblong, 7–8 × 3–4 mm, retuse at apex. Androecium c. 0.5 mm long; filaments c. 1 mm long; anthers yellow. Pistil pale yellow with red tinges, ellipsoid, c. 1 × 0.7 mm, acute at apex, glabrous. Capsules greenish, ellipsoid, 3–3.5 mm long, attenuate and reddish at ends, prominently ridged on outer surface, glabrous; seeds numerous, brown with yellowish-brown longitudinal stripes, oblongoid or oblong-ellipsoid, 0.7–0.8 mm long, slightly narrowed at ends, sparsely with concave protuberances.

Phenology: August–November.

Habitat & Ecology: Rare on dripping rocks and wet places at elevations between 2200 and 2350 m above MSL in association with *Eriocaulon* spp., *Impatiens clavicornu* Turcz., *I. inconspicua* Benth. ex Wight & Arn., *I. pendula* B. Heyne ex Wight & Arn., *I. pseudo-acaulis* Bhaskar, *Isachne kunthiana* (Wight & Arn. ex Steud.) Miq., *Neanotis monosperma* (Wight & Arn.) W.H. Lewis, *Parnassia mysorensis* B. Heyne ex Wight & Arn. and *Tripogon* spp.

Specimen Examined: INDIA, Tamil Nadu: Nilgiris district, Kundahs, E. Barnes B. 43 (K [K000675532, image!]); Bangitappal, M. Murugesan & R. Tharani 149986 (MH).

Distribution: Endemic to Kundahs, in Mukurthi National Park, Nilgiris district of Tamil Nadu.

Conservation Status: This species is confined to Bangitappal, a part of Mukurthi National Park, Nilgiris district, Tamil Nadu. During the present study, only 18 matured individuals have been observed in Bangi Halla,

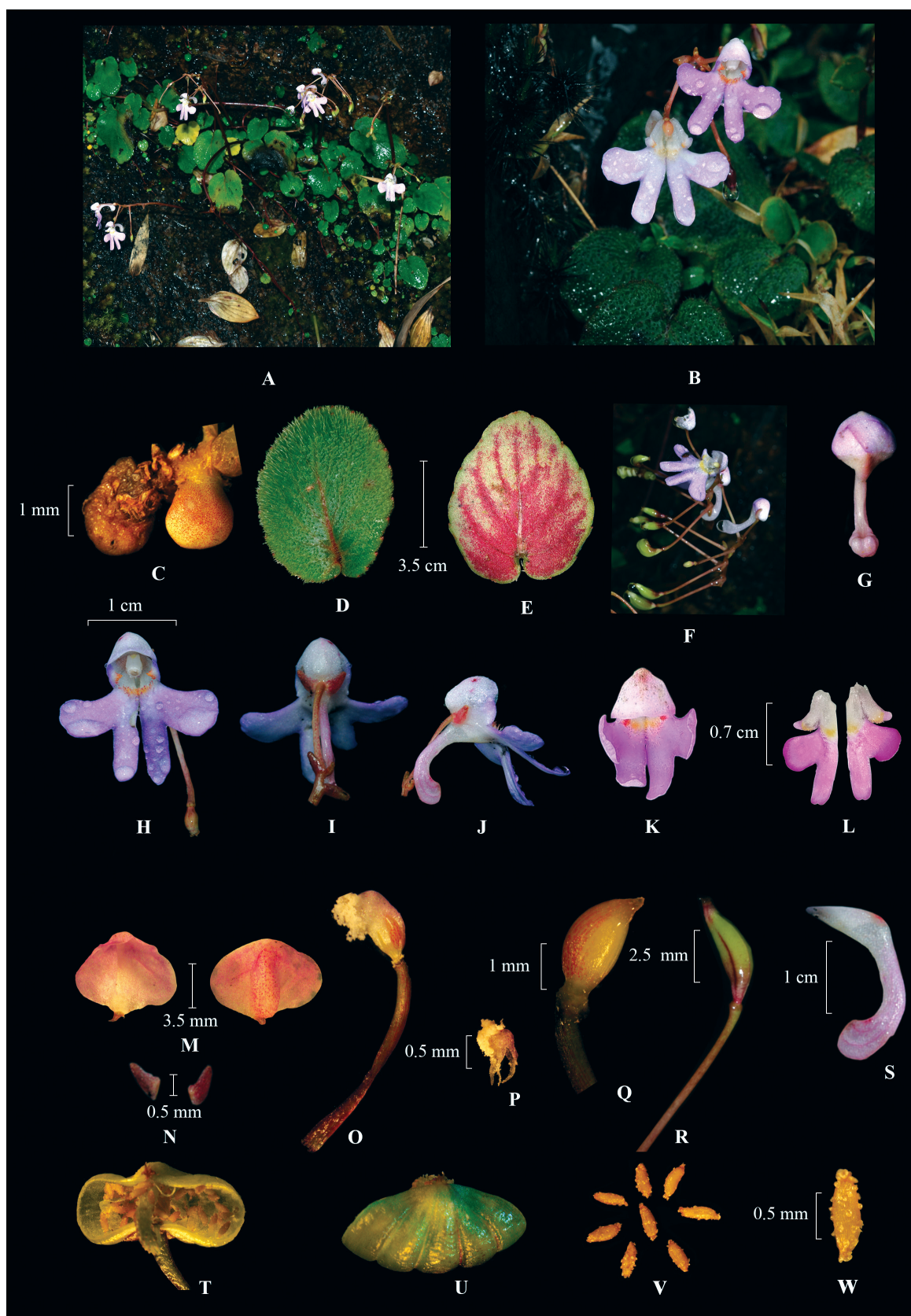


Fig. 2. *Impatiens laticornis* C.E.C. Fisch.: A. Population; B. Habit; C. Tubers; D. Leaf adaxial surface; E. Leaf abaxial surface; F. Inflorescence; G. Flower bud; H. Flower front view; I. Flower back view; J. Flower side view; K. Young flower front view; L. Lateral united petals; M. Dorsal petal (inner and outer views); N. Lateral sepal; O. Stamens with pedicel; P. Stamens; Q. Ovary; R. Fruit; S. Lower sepal with spur; T. Dehiscent fruit front view; U. Dehiscent fruit outer view; V. Seeds; W. Seed close-up.

on way to Bangitappal from upper Bhavani, covering a geographical area of about 3 km². Therefore, it is provisionally assessed here as Critically Endangered (CR) following the guidelines of IUCN Red List Categories and Criteria (IUCN, 2019).

Notes: Edward Barnes collected this species on 18th September 1929 from Kundahs in Nilgiri Mountains and initially identified as *Impatiens modesta* (K000675532, K000675533, images!). However, Fischer (1930) determined the collection of Barnes as new and described it as *Impatiens laticornis*. The species was recollected by Barnes again from same locality during September 1931 (K000675534, image!). However, this species has neither been collected nor reported from the type locality or anywhere else hitherto (Bhaskar, 2012). Nayar & al. (2006) and Balan & Robi (2021) reported this species from Idukki district of Kerala based on Sasidharan (2004), but there is no representative specimen in any of the Indian herbaria as well as any supporting evidences to prove its occurrence in Idukki. Moreover, most of the *Impatiens* species reported from the Western Ghats are very delicate and habitat-specific, and usually exhibit narrow range of distribution with high level of endemism (Bhaskar, 2012), thus the occurrence of this species in Idukki district is quite doubtful. During the present study, this species shows variation in its flower colour, from its early to maturity stage, from pink to whitish.

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