

## ***Toxocarpus palghatensis* Gamble, a little known endemic species of southern Western Ghats, India**

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### Abstract

*Toxocarpus palghatensis* Gamble, is a vulnerable species and least known taxon which has been collected from Kalakad Mundanthurai Tiger Reserve (KMTR), Tirunelveli district of Tamil Nadu state. The species is known only from Kerala, Karnataka and Tamil Nadu states, however for Tamil Nadu, neither a confined location nor any authenticated herbarium sheets are available. Additionally, based on the perusal of original collection, description, subsequent taxonomic treatises and type herbarium; complimentary clauses have been included for better diagnosis and to distinguish this species. In this communication, we are providing detailed updated description, distribution and coloured images for an easy identification.

### INTRODUCTION

The genus *Toxocarpus* is represented with 40 species, distributed in Tropical Africa, Madagascar, South East Asia and Indomalaya (POWO, 2022). In India, the genus is represented by 9 species (Jagtap and Singh, 1999). Southern India is home for six species namely *T. beddomei* Gamble; *T. concanensis* Hook.f.; *T. eriocarpus* Hook.f.; *T. kleinii* Wight & Arn.; *T. longistigma* (Roxb.) Wight & Arn.; and *T. palghatensis* Gamble. While documenting endemic flora of Kalakad Mundanthurai Tiger Reserve (KMTR) in Tamil Nadu state, the authors recorded some interesting specimens of the family Apocynaceae, from Servalar river basin. After a critical examination, the collected species has been identified as *Toxocarpus palghatensis* Gamble, which is so far, has not been reported authentically from Tamil Nadu, India. KMTR is situated in Tirunelveli district, Tamil Nadu; on the leeward side of the southern Western Ghats; forming a part of the

Agasthyamalai Biosphere Reserve (Fig.1). Kalakad and Mundanthurai regions were together declared as a Tiger Reserve in 1988 and this region is one of the plant diversity centers in India for conserving global biological diversity, also declared as Regional Centre of Endemism in the Indian subcontinent (Davis et al, 1995). There are ca. 2255 species of Angiosperms recorded from KMTR, including 448 species endemics to the Western Ghats; in addition, 150 species are strict endemics of the Agasthyamalai region (Richard and Muthukumar, 2012).

***Toxocarpus palghatensis*** Gamble in Kew Bull. 1922:119. 1992; Fl. Pres. Madras 2: 583 (5: 830. 1923). 1957 (Repr. Ed.); Henry et al. Fl. Tamil Nadu Analysis 2: 88. 1987. Jagtap & Singh, Fasc. Fl. India, 24: 284. 1999. Type: India: Southern India; Malabar, Palghat hills, alt. 1000 m, Beddome (Acc. 32232, MH!).

Stems slender; Internodes 3–12 cm long and 1–2 mm in diam., minutely ridged, pubescent and brown when young, glabrous at age, lenticellated. Leaves opposite, decussate, lamina 6–9 × 1.5–3.8 cm, elliptic or elliptic obovate, abruptly acuminate at apex, base acute or obtuse, margin recurved, ciliate along the margin, pubescent and velvet brown on both sides when young, glabrous or nearly so at age, lateral veins 5–6 pairs; petiole terete, 9–17 mm long, 1–1.5 mm diam., curved upward, glabrous. Inflorescence axillary cymes, many-flowered, dichotomous; pedicel terete, 1–1.5 cm long, 1.2 mm diam., densely pubescent and brown; bracts 1.5–2 × 1 mm, ovate, apex acute, margin rusty ciliate, pubescent without. Flowers pinkish outside and yellowish inside; calyx 5 lobed, lobes free, 2 × 1 mm, linear-oblong, apex obtuse, margin rusty ciliate. Corolla 1.3 cm long, corolla tube ca. 3 mm long and mouth hairy, lobes five 10 × 2 mm, linear-lanceolate to linear-oblong, apex acute, glabrous. Corona staminal, uniseriate, five lobed, adnate at the base, as long as or slightly longer than the stamens. Stamens five, ca 2.3 mm long; pollinia five, pollen masses two in each anther cell, yellow, waxy, attached by light-brown caudicles to dark-brown corpuscle. Gynostegium ca. 3 mm long. Ovary conical, 0.1 × 0.05 mm, style single, short, cylindrical; stigma round at top. Follicle not seen. (Fig. 2).

*Flowering*: September–January

*Habitat*: Riparian forest, in between rocky boulders.

*Distribution*: Kerala, Karnataka and Tamil Nadu (Endemic).

*Specimen examined*: INDIA, Tamil Nadu, Kalakad-Mundanthurai Tiger Reserve, Near Kodamady, 280m. 14.10.2021, Karuppusamy. S & P. Bharath Simha Yadav 2114 (SGH). Kerala, Palghat district, Kumattanthode area. 16-01-1980, P. Bhargavan 65519 (MH); Palghat district, Silent valley R.F., 22.12.1962, E. Vajravelu 33255 (MH).

#### Discussion

*T. palghatensis* was described by Gamble based on Beddome's collection from Palghat hills of Kerala. Among the Indian *Toxocarpus* species, *T. palghatensis* distinguished from others by possessing large corolla lobes. Type specimen was collected by Beddome from the type locality of Palghat hills about at 1000 m, elevation (Decas, 1992). Extended distribution of this species is also recorded from the Kannur district of Kerala (Dantas et al., 2016) and Karnataka state (Datar et al., 2005). Henry et al. (1987) included the species wrongly for the Coimbatore district of Tamil Nadu state because

type locality is very close vicinity of Coimbatore and many other later plant collectors mentioned the Palghat hills under Coimbatore district (Henry et al., 1987), hence they enumerated this species in the Flora of Tamil Nadu analysis. Authors are unable to trace out any herbarium specimen belonging to Tamil Nadu (MH, CAL & SGH). Later floristic enumerations of Tamil Nadu by recent workers incorporated the name of *T. palghatensis* but nowhere herbarium voucher number was mentioned (Nayar et al., 2014; Narasimhan and Irwin, 2020). In this communication, the species is authentically reported to the Tamil Nadu state with its additional notes and coloured photographs.

#### Conclusion

This taxon is being a steno-endemic and very few populations in Western Ghats with a greater possibility of habitat loss, it needs urgent conservation attention. Hence this species is recommended for species recovery programme for its conservation through *in situ* and *ex situ* methods.

#### Acknowledgement

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#### Authors' contributions

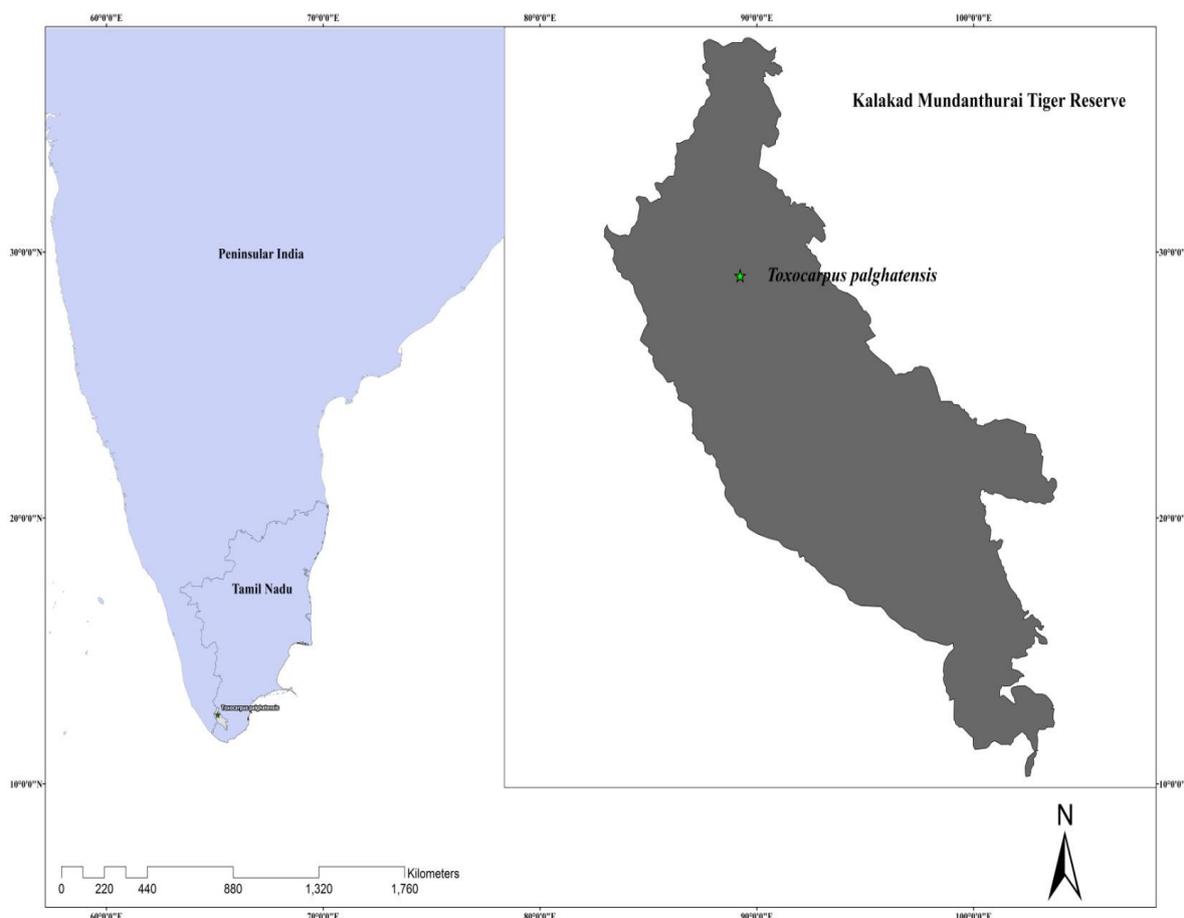
All three authors involved in data collection. The first and second authors have analyzed and interpreted the data. The second author carried out the drafting. The first and third authors made final edits and changes to the article.

**Conflict of interest:** Authors do not have any conflict of interests to declare.

**Ethical issues:** None

#### REFERENCES

- Davis SD, Heywood VH and Hamilton AC, 1995. *Centres of Plant Diversity: A Guide and Strategy for their Conservation*. Asia, Australasia and the Pacific. WWF and IUCN: Cambridge, 2: Pp578.
- Dantas KJ, Sasidharan N and Binu KV, 2016. Additions to the Angiosperms of the flora of Kannur district, Kerala, India from Aralam Wildlife Sanctuary. *Annals of Plant Science*, 5: 1381-1388.
- Datar MN, Manikandan R, Lakshminarasimhan P and Rao PSN, 2005. New plants records for Goa and Karnataka. *Rheedea*, 15(2): 133-135.
- Decas CV, 1992. Decades Kewenses. Plantarum Novarum in Herbario Horti Regii Conservatarum. *Kew Bull*, 3: 177-122.



**Figure 1.** Legend: Map showing the distribution location of *Toxocarpus palghatensis* (Designed by: P. Bharath Simha Yadav)

**Henry AN, Kumari GR, Chitra V, 1987.** *Flora of Tamil Nadu India*. Series 1: Analysis. Vol. 2, Botanical Survey of India, Coimbatore.

**Jagtap A and Singh NP, 1999.** *Fascicle: Flora of India 24*. Botanical Survey of India, Kolkata.

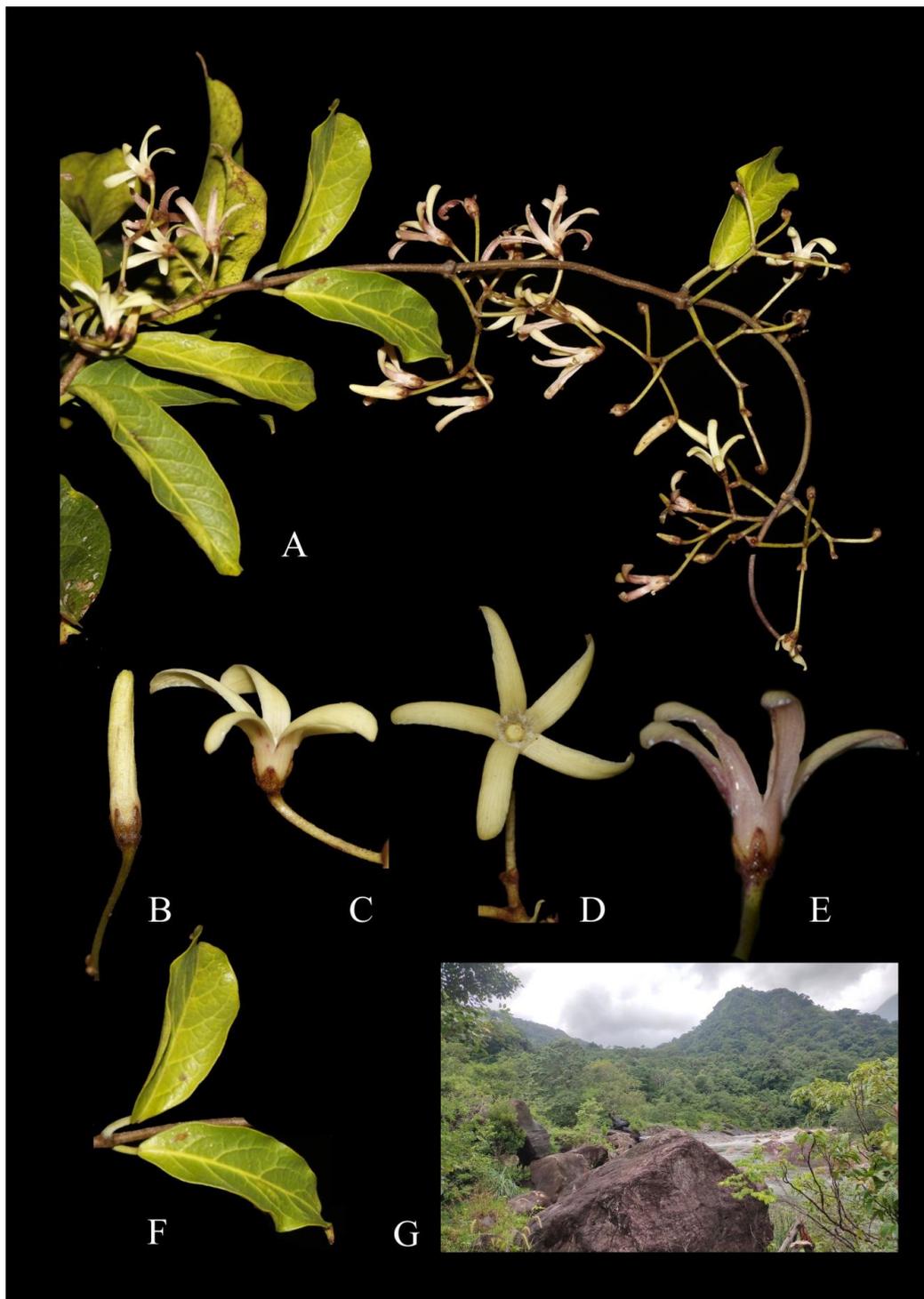
**Narasimhan D and Irwin SJ, 2020.** *Flowering plants of Tamil Nadu: a compendium*. Cape Earth Trust, Chennai.

**Nayar TS, Sibi M and Rasiya BR, 2014.** *Flowering Plants of The Western Ghats, India*. Vol, 1&2. Jawaharlal Nehru Tropical Botanical Garden

and Research Institute, St. Joseph's Press, Thiruvananthapuram.

**POWO (2022).** "Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. Published on the Internet; <http://www.plantsoftheworldonline.org>.

**Richard PSS and Muthukumar SA, 2012.** Arborescent Angiosperms of Mundanthurai Range in the Kalakad-Mundanthurai Tiger Reserve (KMTR) of the southern Western Ghats, India. *Check List*, 8(5): 951–962, 2012.



**Figure 2.** Legend: A. Habit, B. Flower bud, C& E.. Flower lateral view, D. flower top view, F. Leaves adaxial view, G. Habitat (Photos: P. Selva Sing Richard, A-D and P. Bharath Simha Yadav, E-G)

*Cite this article*

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