

SHORT COMMUNICATION

RELOCATION, *EX-SITU* CONSERVATION AND VEGETATIVE PROPAGATION OF *ANDROGRAPHIS CHENDURUNII* E.S.S. KUMAR, A.E.S. KHAN & S.G. GOPAL (ACANTHACEAE): A STENO-ENDEMIC SPECIES OF THE SOUTHERN WESTERN GHATS

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Abstract: *Andrographis chendurunii* E.S.S. Kumar, A.E.S. Khan & S.G. Gopal, a steno-endemic species of the southern Western Ghats in Kerala, was successfully relocated to the Shendurney Wildlife Sanctuary after a lapse of three decades. Notes on its ecology, habitat, ex-situ conservation and propagation techniques are provided as complementary measures towards the long-term recovery and conservation of this narrowly distributed endemic species.

Keywords: *Andrographis chendurunii*, Rediscovery, Steno-endemic, Ex-situ conservation, Vegetative propagation

INTRODUCTION

The genus *Andrographis* Wall. ex Nees (Acanthaceae) comprises 27 accepted species (Table-1) distributed mainly in tropical and subtropical Asia, with peninsular India, particularly the Western Ghats, representing an important centre of diversity and endemism (Mabberley, 2008; Tomar, 2024; POWO, 2026). Kerala supports 18 species of *Andrographis*, among which *A. chendurunii* is unique as the only species strictly endemic to the state. The species has an extremely restricted distribution in the southern Western Ghats, particularly the Shendurney Wildlife Sanctuary and

adjoining areas, making it a species of high phytogeographical and conservation significance. *Andrographis chendurunii* was first collected from Pandimotta, Shendurney Wildlife Sanctuary, in 1994 and described as a new species by Kumar *et al.* (2002). Since the original description was based only a once collected herbarium materials, the other information on its ecology, population status and reproductive biology remained limited. Despite repeated botanical surveys, the species was not relocated for nearly three decades, and habitat degradation at the type locality, including landslides, raised concerns about its possible local extinction.

Table 1. World checklist of the genus *Andrographis* Wall. ex Nees with distribution

Sl No	Species Name	Distribution
1	<i>Andrographis affinis</i> Nees	India
2	<i>Andrographis alata</i> (Vahl) Nees	S. India, Sri Lanka
3	<i>Andrographis atropurpurea</i> (Dennst.) Alston	India
4	<i>Andrographis beddomei</i> C.B.Clarke	India (Andhra Pradesh)
5	<i>Andrographis chendurunii</i> E.S.S.Kumar, A.E.S.Khan & S.G.Gopal	India (Kerala)
6	<i>Andrographis echioides</i> (L.) Nees	Indian Subcontinent to Myanmar
7	<i>Andrographis elongata</i> (Vahl) T.Anderson	S. India
8	<i>Andrographis explicata</i> (C.B.Clarke) Gamble	India
9	<i>Andrographis glandulosa</i> (Roth) Nees	S. India
10	<i>Andrographis gracilis</i> Nees	SW. India
11	<i>Andrographis lawsonii</i> Gamble	S. India
12	<i>Andrographis lineata</i> Nees	S. India
13	<i>Andrographis lobelioides</i> Wight	S. India
14	<i>Andrographis longipedunculata</i> (Sreem.) L.H.Cramer ex Karthik. & Moorthy	Indian Subcontinent to Myanmar

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15	<i>Andrographis macrobotrys</i> Nees	S. India, Sri Lanka
16	<i>Andrographis megamalayana</i> Gnanasek., Karupp. & G.V.S.Murthy	SW. India
17	<i>Andrographis neesiana</i> Wight	India
18	<i>Andrographis paniculata</i> (Burm.f.) Wall. ex Nees	Indian Subcontinent
19	<i>Andrographis producta</i> (C.B.Clarke) Gamble	India
20	<i>Andrographis rothii</i> C.B.Clarke	S. India
21	<i>Andrographis rotundifolia</i> (Sreem.) Sreem.	India (Tamil Nadu)
22	<i>Andrographis saxatilis</i> Raja Kullayisw. & Sarojin.	India (Andhra Pradesh)
23	<i>Andrographis serpyllifolia</i> (Rottler ex Vahl) Wight	S. India
24	<i>Andrographis stellulata</i> C.B.Clarke	S. India
25	<i>Andrographis stenophylla</i> C.B.Clarke	India
26	<i>Andrographis theniensis</i> Karupp. & Bharath	India (Tamil Nadu)
27	<i>Andrographis viscosula</i> Nees	S. India

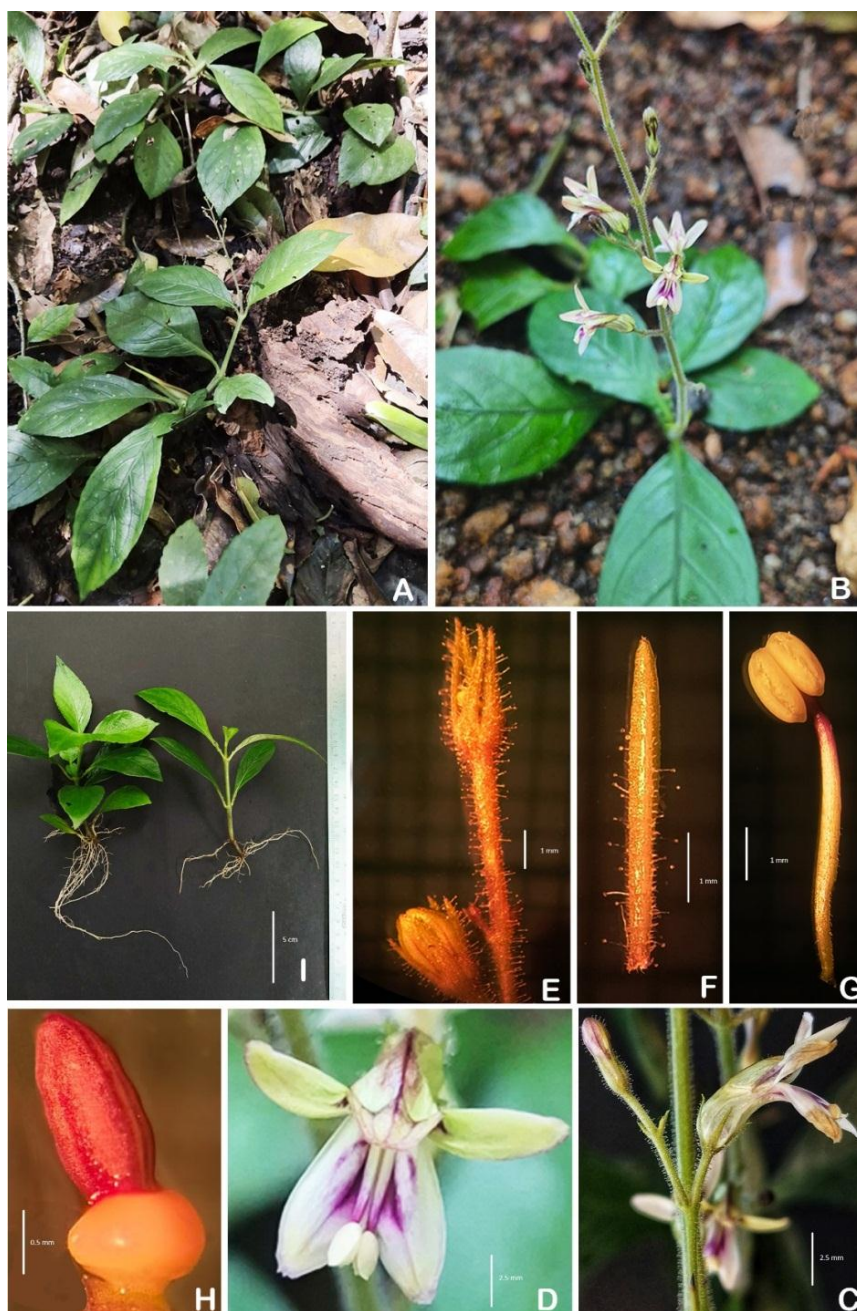


Figure 1. *Andrographis chendurunii*. A.&B. Habit. C Closeup view of a flower and bud. D. Flower-front view. E. Calyx. F. Bracteole. G. Stamen. H. Pistil. I. Rooted stem cuttings.

Relocation of *Andrographis chendurunii*

The Shendurney Wildlife Sanctuary is one of the most important centers of plant endemism in the southern Western Ghats, supporting 951 species of flowering plants belonging to 118 angiosperm families (Sasidharan, 1997). Continued botanical exploration has revealed several narrowly endemic taxa, including *Ardisia stonei* Sasidh. & Sivar., *Monoon shendurunii* (Basha & Sasidh.) B.Xue & R.M.K.Saunders [= *Polyalthia shendurunii* Basha & Sasidh.], *Ophiorrhiza shendurunii* A.E.S.Khan, E.S.S.Kumar & Pushp., *Humboldtia nairiana* E.S.S.Kumar, Shareef et Sabu, and several other species known only from this protected area or its immediate surroundings. *Andrographis chendurunii* is a narrowly endemic species confined to the southern Western Ghats of Kerala, was first collected from Pandimotta in the Shendurney Wildlife Sanctuary in 1994 and described as a new species by Kumar *et al.* (2002). The original description was based solely on herbarium specimens, and little was known about its ecology, population size, reproductive biology, or conservation status. Despite repeated botanical surveys over the following three decades, the species was not relocated, and extensive habitat degradation at the type locality due to landslides raised concerns about its possible local extinction.

Extensive floristic surveys conducted in previously unexplored evergreen forests of the sanctuary led to the finding of two healthy populations of *A. chendurunii* along the Palaruvi–Rosemala route and at Aryankavu. More than 50 mature individuals were recorded in both localities, growing in moist shaded stream banks beneath the evergreen forest canopy, indicating a strong preference for humid, low-light microhabitats. The main associated species are *Diospyros montana*, *Elatostemma lineolatum*, *Gomphostemma eriocarpon*, *Lea indica*, *Justicia* spp., *Pellionia heyneana*, etc. The rediscovery facilitated detailed ecological observations, the preparation of an emended morphological description, documentation of its phenology, and an assessment of its conservation status. A limited number of stem cuttings were collected with minimal disturbance to the natural populations and were successfully established in the Threatened Species Park of the Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI), where they are being maintained for ex situ conservation and vegetative propagation studies. The rediscovery of *A. chendurunii* further emphasizes the importance of sustained botanical exploration, long-term population monitoring, habitat protection, and integrated in situ and ex situ conservation measures to safeguard the unique and highly localized flora of this globally significant biodiversity hotspot.

Taxonomic description

Andrographis chendurunii E.S.S.Kumar, A.E.S.Khan & S.G.Gopal, Nordic J. Bot. 22: 683.

2002; Nayar *et al.*, Flow. Pl. Kerala 10.2006; Nayar *et al.*, Flow. Pl. Western Ghats 12. 2014. (Figure 1) Perennial herbs or subshrubs. Stems creeping, rooting at the lower nodes, quadrangular, glandular-pubescent along the furrows. Leaves 6–15 × 3.5–5.5 cm, broadly ovate-obovate to elliptic-oblancheolate; base acute to cuneate; apex acute to shortly acuminate; margin entire; lamina glabrous above, minutely pubescent along the nerves beneath; lateral nerves 5–7 pairs, arching; petiole 0.5–2 cm long. Inflorescence a profusely branched terminal panicle, 20–45 cm long; peduncle stout, minutely hairy; bracts and bracteoles subulate, up to 4 mm long; pedicels slender, 4–5 mm long, glandular-hairy. Calyx deeply 5-lobed almost to the base; lobes 2.5–3 mm long, glandular-hairy outside and glabrous within. Corolla bilabiate, greenish-white; tube up to 6.5 mm long, slightly curved, glabrous externally; lower lip of limb up to 6.5 × 4.5 mm; upper lip up to 7 × 8 mm; lobes ovate-oblong, up to 5 × 3.5 mm, obtuse to rounded at the apex, middle lobe larger than the laterals, with reddish-brown spots at the base. Stamens 2, exserted; filaments up to 7 mm long, not dilated at the base, minutely puberulous towards the base; anthers 2-celled, glabrous. Ovary ovate-oblong, 1.2–1.5 mm long; style slender, up to 7 mm long, sparsely hairy; stigma inconspicuously bifid at the apex. Capsule linear-obovate, up to 1.5 × 0.3 cm, dorsally compressed, acuminate, glabrous. Seeds 4–6, brown, to 1.8 × 1 mm, subquadrate, rugose, glabrous; retinacula acute.

Ex-situ Conservation and Propagation

Ex-situ conservation is widely recognized as an essential component of integrated biodiversity conservation strategies, particularly for rare and threatened species with restricted distributions (Heywood, 2017). Considering its unique morphology, rarity and highly restricted distribution, an ex-situ population of *Andrographis chendurunii* was established at the Threatened Species Park, JNTBGRI. The primary objective was to develop an insurance population to safeguard the species against potential extinction in the wild and to provide living material for long-term monitoring, reproductive studies, propagation research and future restoration programmes.

A limited number of stem cuttings were collected from healthy plants with minimal disturbance to natural populations and successfully established under ex-situ conditions. The establishment of healthy plants at JNTBGRI provides an important safeguard for the species and reduces dependence on wild populations for future research and conservation activities. Field observations indicated poor seed production and limited natural recruitment, suggesting that seed-based propagation may not be adequate for rapid multiplication. Therefore, stem-tip cuttings were evaluated as an alternative propagation method.

Healthy, mature shoots bearing two to three nodes were collected and planted in polybags containing a mixture of forest soil and well-decomposed cow dung. The cuttings were maintained under controlled mist-chamber conditions to promote rooting and subsequent establishment. The propagation trials resulted in 80–100% rooting, with healthy plantlets developing within 45–60 days. The high rooting percentage demonstrates that stem-tip cuttings are an efficient and reliable method for the rapid multiplication of *A. chendurunii*. This protocol can facilitate the establishment of genetically representative ex-situ collections and provide planting material for population reinforcement, habitat restoration and future reintroduction programmes.

DISCUSSION

The rediscovery of *A. chendurunii* after more than three decades demonstrates the continuing importance of systematic botanical exploration in the southern Western Ghats. Although the species had been described from a single collection made in 1994, the absence of subsequent records had raised concerns about its possible extinction. The discovery of viable populations within Shendurney Wildlife Sanctuary confirms the persistence of remnant populations in suitable microhabitats and highlights the role of protected areas as refugia for narrowly endemic species.

Fresh material obtained during the rediscovery substantially improved knowledge of the species' morphology, habitat and ecology. Its strong association with moist, shaded stream banks under evergreen forest canopies suggests a high degree of habitat specialisation, which may partly explain both its rarity and the difficulty in relocating it during earlier surveys.

The disappearance of the species from its type locality, together with its survival at other localities, emphasises the vulnerability of steno-endemic plants to habitat modification, floods, landslides and other stochastic events. Climate change and the increasing frequency of extreme climatic disturbances may further increase extinction risks for species with highly restricted distributions.

A major outcome of the study is the successful establishment of an ex-situ population and the development of an efficient vegetative propagation method. The 80–100% rooting success obtained from stem cuttings demonstrates that vegetative propagation can overcome the limitations associated with poor seed production and low natural recruitment. Propagated plants can serve as an insurance population and provide material for future population reinforcement, habitat restoration and reintroduction.

The occurrence of *A. chendurunii* together with other narrowly endemic species, including *Ardisia stonei*,

Monoon shendurunii, *Ophiorrhiza shendurunii* and *Humboldtia nairiana*, further demonstrates the importance of Shendurney Wildlife Sanctuary as a centre of plant endemism in the southern Western Ghats. Continued floristic surveys, ecological monitoring and integrated conservation planning are therefore essential.

CONCLUSION

The rediscovery of *Andrographis chendurunii* after more than three decades, together with the establishment of healthy ex-situ collections and successful vegetative propagation, represents an important advance in the conservation of this steno-endemic species of the southern Western Ghats. Stem-tip cuttings showed 80–100% rooting within 45–60 days, providing a practical method for rapid multiplication and production of planting material for conservation programmes. Long-term survival of the species will depend on integrating protection of its natural habitat with ex-situ conservation, population monitoring, propagation, genetic assessment and carefully planned recovery interventions.

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