



# *Andrographis nallamalayana*, a heterotypic synonym of a little-known endemic species *A. beddomei* (Acanthaceae)

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## Abstract

*Andrographis nallamalayana* J.L. Ellis, a well-known endemic species from the Eastern Ghats of Andhra Pradesh, is reduced here to a synonym of a little-known endemic species, *A. beddomei* C.B. Clarke. A detailed description, photographs, and distribution map of the species are provided here.

**Keywords:** Acanthaceae, *Andrographis beddomei*, *Andrographis nallamalayana*, heterotypic synonym

## Introduction

*Andrographis* Wall. ex Nees is a tropical Asian genus (Mabberley, 2008), represented by 28 taxa in India (Karthikeyan *et al.*, 2009), of which 23 are endemics (Gnanasekaran & Murthy, 2012). During the systematic study of *Andrographis* in India, we found that *A. nallamalayana* J.L. Ellis (1967), a species that has long been treated as a strict endemic of Nallamalais in the Eastern Ghats of Andhra Pradesh is conspecific with *A. beddomei* C.B. Clarke (1884) and therefore it is merged here with the latter. Besides, a complete description, photographs and distribution map of this species are provided to facilitate correct identification.

Clarke (1884) described *Andrographis beddomei* based on a single collection (*R.H. Beddome s.n.*, BM) from the 'Nallaymallays' (Nallamalais) in Kurnool district of Andhra Pradesh. Later Gamble (1924) included this species in his *Flora of the Presidency of Madras* based on two collections, viz. *R.H. Beddome s.n.* from Nallamalais and *C.E.C. Fischer s.n.* from Lankamalai in Cuddapah district, Andhra Pradesh. Thereafter, this species remained unknown or poorly known until it was rediscovered in the Palakonda hills (*R.V. Reddy 8124*, SKU!) in Cuddapah district after 68 years (Raju & Reddy, 1991).

Ellis (1967) described a new species, *Andrographis nallamalayana* based on his collections from Ahobilam and Chellama of Kurnool district. He distinguished it from *A. beddomei* by its a low

decumbent herbaceous habit, the inflorescence both axillary and terminal, the longer calyx lobes and the plants drying dark green or black. However, Ellis (1990) did not include *A. beddomei* in his *Flora of Nallamalais* and was presumably unfamiliar with this species.

During the present systematic study of *Andrographis* in India, the senior author (GG) made a fresh collection of this species from Chellama, one of the type localities of *A. nallamalayana*. While confirming the identity of this material, the holotype deposited at CAL and isotypes and paratypes housed at MH and other collections at CAL, FRC, MH and SKU were also studied. Furthermore, examination of a digital image of *A. beddomei* at K disclosed that the specimen [*C.E.C. Fischer s.n.* (K000545916, image!)] has both axillary and terminal raceme with long calyx lobes (*c.* 10 mm long) and it is also evident from the specimen that it is a herbaceous glabrous plant with very thick rootstock (**Fig. 3b**). The specimen (*R.H. Beddome s.n.*, BM) studied by Clarke (1884) is also a portion of a decumbent herbaceous plant.

A critical examination of types and other materials of *A. nallamalayana* and *A. beddomei* coupled with the fresh materials and field observations showed that the former is conspecific with the latter. Therefore, it is treated a heterotypic synonym of the latter based on the principle of priority of ICN (McNeill *et al.*, 2012). Further, it is recorded here

that this species has wide range of variation in the shape and size of leaves, position and length of inflorescence, length of pedicel and calyx depending on edaphic and climatic differences.

Fresh photographs of a plant (**Fig. 1a**), a flowering branch (**Fig. 1b**) and a flower (**Fig. 1c**) with one of the isotypes of *A. nallamalayana* are provided here (**Fig. 3d**) to show the variation in the shape of leaves and length of calyx. A detailed description, covering the complete range of variation observed in the species is given below.

***Andrographis beddomei*** C.B. Clarke in Hook.f., Fl. Brit. India 4: 506. 1884; Gamble, Fl. Madras: 1050. 1924; M.P. Nayar *et al.*, Indian J. Forest. 7: 37. 1984; Ahmedullah & M.P. Nayar, Endemic Pl. Ind. Reg.: 146. 1986; R.R.V. Raju & R.V. Reddy, J. Indian Bot. Soc. 70: 437. 1991; Moulali in Pull. & Moulali, Fl. Andhra Pradesh 2: 692. 1997; Karthik. *et al.*, Fl. Pl. India – Dicotyl. 1: 2. 2009; S.S. Rani & Nazeeruddin in Pull. *et al.*, Fl. Eastern Ghats 4: 386. 2011. **Figs. 1, 2**

*Typus*: INDIA, **Andhra Pradesh**, Kurnool district, Nallaymallays (Nallamalais), 2000 ft, s.dat., R.H. Beddome s.n. (Holotypus, BM, BM000950061!). **Fig. 3a**

*Andrographis nallamalayana* J.L. Ellis, Bull. Bot. Surv. India 8: 362. 1967; M.P. Nayar *et al.*, Indian J. Forest. 7: 37. 1984; Ahmedullah & M.P. Nayar, Endemic Pl. Ind. Reg.: 146. 1986; Moulali in Pull. & Moulali, Fl. Andhra Pradesh 2: 693. 1997; Karthik. *et al.*, Fl. Pl. India – Dicotyl. 1: 3. 2009; S.S. Rani & Nazeeruddin in Pull. *et al.*, Fl. Eastern Ghats 4: 386. 2011, **syn. nov.**

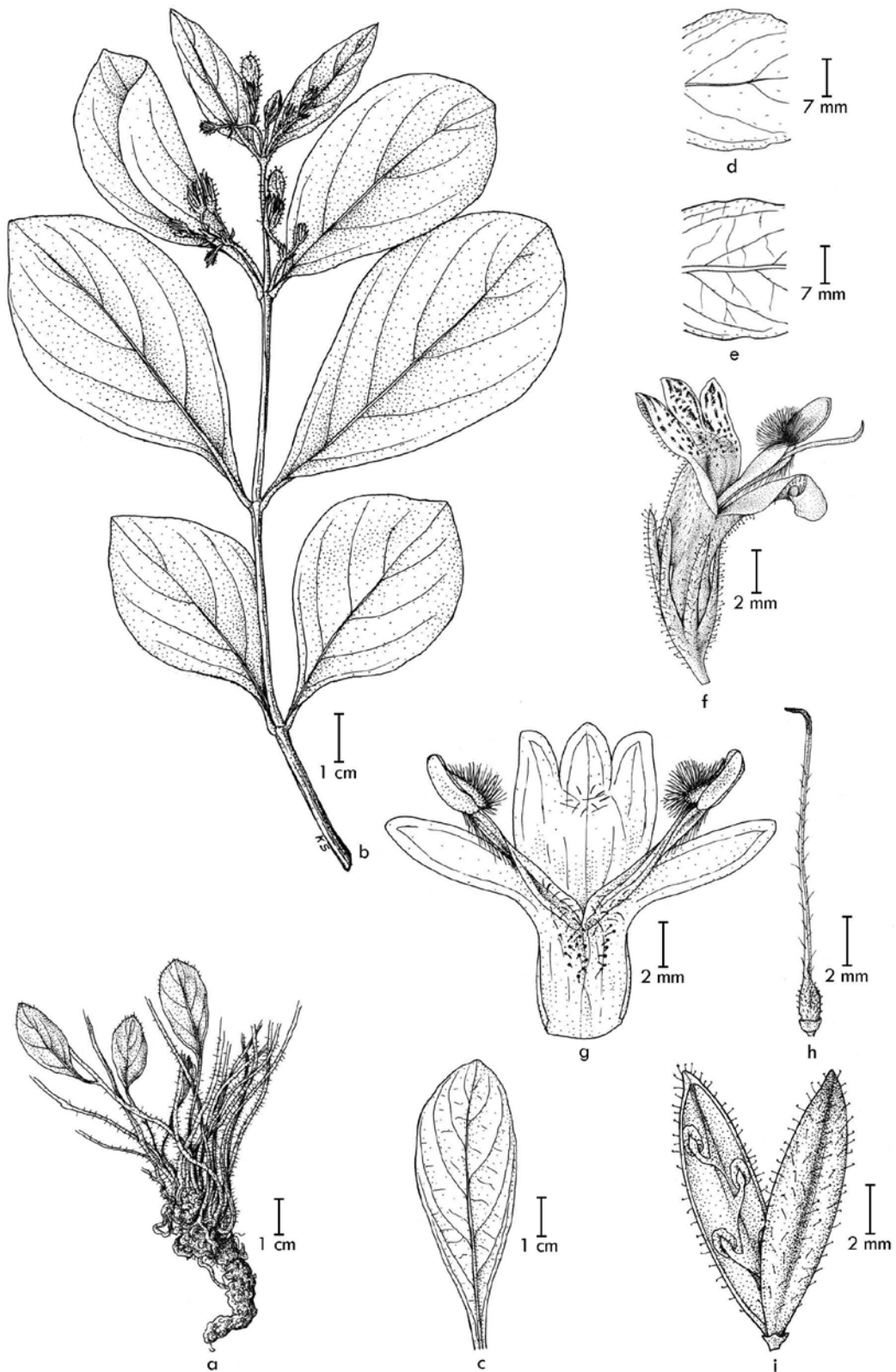
*Typus*: INDIA, **Andhra Pradesh**, Kurnool district,

Way to upper Ahobilam, 290 m, 29.8.1965, J.L. Ellis 25546 (Holotypus, CAL, CAL0000019979!; Isotypii, MH!). **Figs. 3c, d**

Herb, prostrate to decumbent, 30–60 cm high; rootstock very thick. Stems inconspicuously 4-angled to subterete, minutely puberulous to glabrous, pubescent when young, glandular-hairy towards rootstock; nodes not distinctly swollen. Leaves obovate to narrowly oblanceolate, elliptic or ovate, rarely oblong towards apex, 2.5–9 × 1–3(4.5) cm, decurrent at base, entire or undulate with minute hair along margins, acute or obtuse at apex, coriaceous, puberulent to glabrous when mature, pubescent when young; veins conspicuous on both sides; lateral veins 3–6 pairs; petioles to 5 mm long, puberulent to glabrous. Inflorescence a raceme, axillary and terminal, to 7 cm long, very rarely branched, a few-flowered, very rarely flowers solitary or fascicled in axillary; rachis 4-angled, glandular-pubescent; flowers closely arranged (interstices 3–6 mm long), twisted at right angles to each other, one-sided; peduncles to 1.2 cm long, glandular-pubescent; pedicels slender, 4–15 mm long, glandular-pubescent. Bracts 2, ovate-lanceolate, 2.5–5 × 0.6–0.8 mm, hairy at margins, acute to obtuse at apex, foliaceous, glandular-pubescent outside, antrorsely appressed strigulose inside, green. Bracteoles 2, linear, 2–2.5 × 0.25–0.3 mm, hairy at margins, acute or obtuse at apex, glandular-pubescent outside, antrorsely appressed strigulose inside, green. Calyx 5-lobed; lobes subequal, linear, 6–15 × 0.5–1 mm, hairy at margins, acuminate at apex, antrorsely strigulose inside, glandular-pubescent outside. Corolla 1–1.2 cm across, white with yellow shade, 2-lipped; upper lip spatulate to oblong, 6–6.8 × 2.6–3 mm, entire at margins, obtuse at apex, minutely 2-fid (0.6–0.8



**Fig. 1.** *Andrographis beddomei* C.B. Clarke: **a.** Habit; **b.** Flowering twig; **c.** A flower.



**Fig. 2.** *Andrographis beddomei* C.B. Clarke: **a.** Rootstock; **b.** Flowering-twig; **c.** Leaf; **d** & **e.** Portion of leaves, **d.** Adaxial surface, **e.** Abaxial surface; **f.** A Flower; **g.** Corolla split-open; **h.** Pistil; **i.** Dehiscent fruit. (Drawn from *R.H. Beddome s.n.*, BM000950061 and *G. Gnanasekaran 126875*, MH).



**Fig. 3.** **a.** *Andrographis beddomei* C.B. Clarke (R.H. Beddome s.n., BM000950061; Holotype); **b.** *Andrographis beddomei* C.B. Clarke (C.E.C. Fischer s.n., K000545916); **c.** *Andrographis nallamalayana* J.L. Ellis (J.L. Ellis 25546, CAL0000019979; Holotype); **d.** *Andrographis nallamalayana* J.L. Ellis (J.L. Ellis 25546, MH00000805; Isotype).

mm long), glabrous inside, glandular-hirsute outside, 5-veined; lower lip 5.5–6.5 × 5–6 mm, entire at margins, obtuse at apex, glabrous inside except at centre of middle lobe, glandular-hirsute outside, dark purple-striped, 3-lobed; middle lobe narrowly ovate, 2–2.3 × 3–3.3 mm, hirsute at centre, 3-veined; lateral lobes oblong, 1.5–1.7 mm long, 3-veined; tube prominently ventricose, 7–8.3 × 1.3–2.5 mm, glandular-hirsute above, glabrous below. Stamens 2, adnate to base of ventricose portion of corolla tube; filaments 7–7.5 mm long, dilated at base, retrorsely pilose and pubescent at attachment; anthers linear to oblong, 2.5–3 × 0.6–1 mm, woolly at base, deep purple. Ovary ovoid-oblongoid, 1–1.2 × 0.8–1 mm, densely glandular-hairy; style 12–14 mm long, antrorsely bristled hairy; stigma linear, green. Capsules linear-oblong to very narrowly ellipsoid, acute at ends, 10–15 × 3–4 mm, sparsely glandular-hairy when young, 4–8-seeded. Seeds oblongoid or narrowly obovoid, oblique at base, obtuse at apex, very hard, lacunosus (deeply pitted), yellowish brown.

*Flowering & Fruiting:* August–April.

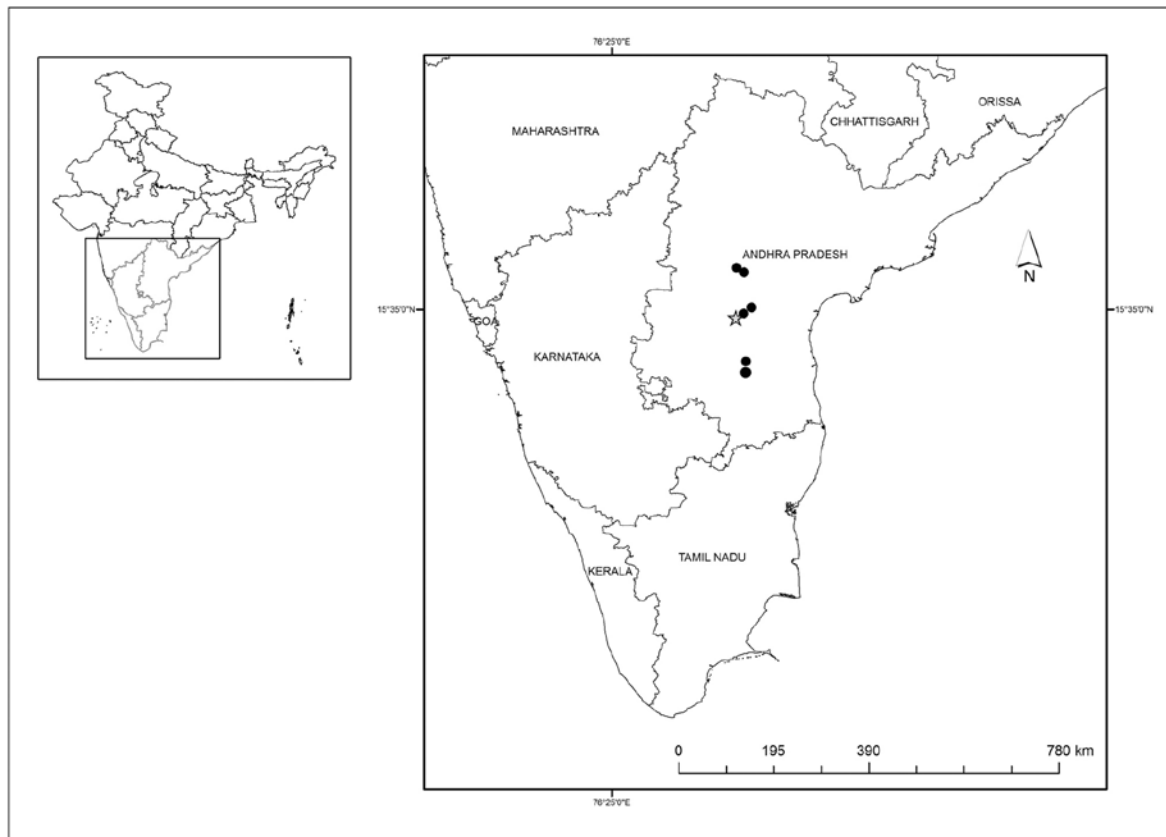
*Habitat:* Dry deciduous forests at elevations between 250 and 700 m.

*Distribution:* India, Andhra Pradesh (Cuddapah, Kurnool, Mahabubnagar and Prakasam districts).

**Fig. 4**

Babu *et al.* (2006) reported *A. beddomei* as a new record to Karnataka state based on a collection from Kolikal in Tumkur district by S.M. Hiremath 70824 (FRLH!). This report led Karthikeyan *et al.* (2009) to include its distribution in Karnataka as well. However, a critical study of the specimen housed at FRLH, revealed that it was mistakenly identified as *A. beddomei* and further confirmed its identity as *A. lineata* Wall. ex Nees, a species endemic to southern India. Therefore, it is concluded here that the species is confined to the state of Andhra Pradesh in India and does not extend to Karnataka. Moulali (1997) and Rani & Nazeeruddin (2011) have reported its occurrence in Simhachalam hills, Vishakapatnam district, Andhra Pradesh based on the specimens SKW 4406, 4415 housed at BLAT. However, Rao and Kumari (2008) did not include this species in the *Flora of Vishakapatnam District*, so these records cannot be accepted without confirmation.

*Conservation Status:* Henry *et al.* (1979) treated *Andrographis beddomei* as one of the rare and



**Fig. 4.** Distribution of *Andrographis beddomei* C.B. Clarke in southern India (☆ - fresh collection, ● - herbarium collections).

threatened plant species of southern India. Walter and Gillett (1998) categorized its conservation status as Data Deficient (DD), as there was insufficient information about its occurrence and distribution in India. It is evaluated here as 'Vulnerable' [VU Bab(iii)+2ab(iii)] using the IUCN Red List Categories and Criteria Version 3.1 (IUCN, 2012). This species is locally very common but faces increased habitat fragmentation. The invasion of alien species also poses considerable pressure on the survival of this species.

*Specimens examined:* INDIA, **Andhra Pradesh**, Cuddapah district, Lankamalai, 700–1000 ft (c. 210–300 m), 17.03.1923, C.E.C. Fischer s.n. (K000545916, image!); Yerabetukonta, Lankamala, 15.11.1965, K.N. Subramanian 2411 (FRC); Palakonda hills, 08.12.1988, C. Subbarayudu 8231 (SKU); Glivvalacherlivu RF, near Isukagundam, 11.12.1988, R.V. Reddy 8124 (SKU); Kurnool district, Kurnool hills, s.dat. R.H. Beddome? s.n. (MH); Nallamalais, Chellama, 365 m, 04.07.1963, J.L. Ellis 16709 (MH); Nallamalais, Chellama, 380 m, 18.03.1965, J.L. Ellis 23715 (MH); Way to Balugram–Ahobilam, 325 m, 23.11.1969, J.L. Ellis 32592 (MH); Nallamalai region–Pacherlaka, 28.01.2004, S.K. Nazeeruddin 24885 (CAL & SKU); Upper Ahobilam, 12.10.2006, B. Ravi Prasad Rao & T. Shali Saheb 29857 (SKU); Ahobilam, 736 m, 28.01.2009, VSR, KP & BR 38905 (SKU); Nallamalais, Chellama, 340 m, 16.12.2012, G. Gnanasekaran 126875, 126876 (MH); Mahabubnagar district, Farahabad 1966 plantation, Mannanur range, 17.12.1967, K.N. Subramanian 3286 (FRC); Malleatheerthum, 348 m, 03.07.2007, BSS & SKB 29567 (SKU); Prakasam district, Diguvametta, 1400–2000 ft (c. 420–600 m), 11.08.1921, C.E.C. Fischer 4658 (FRC); Pedapenta, 04.10.1995, R. Vijayakumar 15864 (SKU).

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