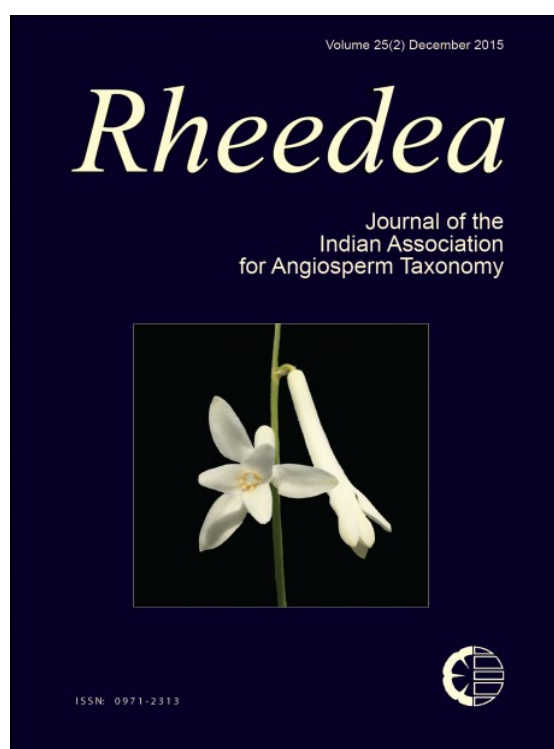




Heliotropium amplexicaule (Boraginaceae-Heliotropiodeae): A new record for Indian sub-continent

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Heliotropium amplexicaule (Boraginaceae-Heliotropioideae): A new record for Indian sub-continent

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Abstract

Heliotropium amplexicaule Vahl belonging the family Boraginaceae is native of South America and a widespread noxious weed in Australia, United States and some parts of Central America. The species is now recorded for the first time from the Indian sub-continent. A brief taxonomic description with illustrations is provided here.

Keywords: *Heliotropium amplexicaule*, Indian sub-continent, Bangalore, new record

Introduction

Heliotropium L. (Boraginaceae: Heliotropioideae) is one of the widespread genus originating from the Old World tropics and sub-tropics with c. 350 species. It is spread to the warm and warm temperate zones of all continents (Mabberly, 2008; Zheng-yi & Raven, 1995). In India, this genus is represented by 18 species (Digital flora of Karnataka, 2014; Gamble, 1921; Hooker, 1885; Matthew, 1995).

Heliotropium amplexicaule Vahl, a native of South America, is now naturalized in other parts of America and is reported as a noxious weed in Australia (Parsons & Cuthbertson, 1992). In Asia, the species is reported from Malaysia and parts of south-east Asia (Steenis, 1997). The present collection from Bangalore, Karnataka, India makes this a new distribution record for the Indian sub-continent.

H. amplexicaule is found growing in the semi-wilderness habitat of Indian Institute of Science, Bangalore campus, which is a part of the southern Deccan Plateau with an elevation of about 962 m. The species is found associated with other herbs such as *Synedrella vialis* (Less.) A.Gray, *Tridax procumbens* (L.) L., *Senecio tenuifolius* N.Burman, *Richardia scabra* L. and *Emilia sonchifolia* (L.) DC. ex DC.

A small population of this taxon comprising of c. 10 individuals was spotted by the authors which on critical study determined as *H. amplexicaule* Vahl.

A thorough scrutiny of literature in consultation with the type revealed that the species was hitherto not known to occur in Indian subcontinent. A brief description along with illustration and photographs (Fig 1 & 2) is provide for easy identification of the taxon.

Heliotropium amplexicaule Vahl, Symb. Bot. 3: 21. 1794; I. M. Johnston, Contr. Gray Herb. 81: 21. 1928, H. Riedl in Fl. Malesiana. 1(13): 101. 1997. *Cochranea anchusifolia* (Poir.) Gürke in Engl. & Prantl. Nat. Pflanzenfam. 4 (3a): 97. 1894. *Heliotropium anchusifolium* Poir. Encycl. Suppl. 3: 23. 1813. **Fig. 1, 2, 3**

Perennial sub-erect hairy herbs upto 45 cm high. Root, dark-brown to black. Stem hirsute, much branched from the root stalk, cylindric, ascending. Leaves sub-sessile, crowded at apex, 3.5–6 × 1.5–2 cm, elliptic-oblong, strigose on both sides, more below, base attenuate, margin undulate, apex obtuse, nerves 6–10-pairs, impressed above, pale green. Inflorescence in terminal helicoid cyme, 10 cm long, dichotomously branched; peduncle up to 5 cm long, hirsute. Flowers c. 4.8 mm, in two rows on the peduncle, purplish-blue to violet, turning brownish when dry, sessile, ebracteate. Calyx 5-lobed, c. 3.5 mm long linear, light-green, glandular hairy without, glabrous within, tube 1 mm long. Corolla 5-lobed, upto 6 mm long, pubescent without, tube upto 4 mm long and greenish-yellow; throat yellowish, villous hairy within in 5 vertical lines. Stamens 5, glabrous,

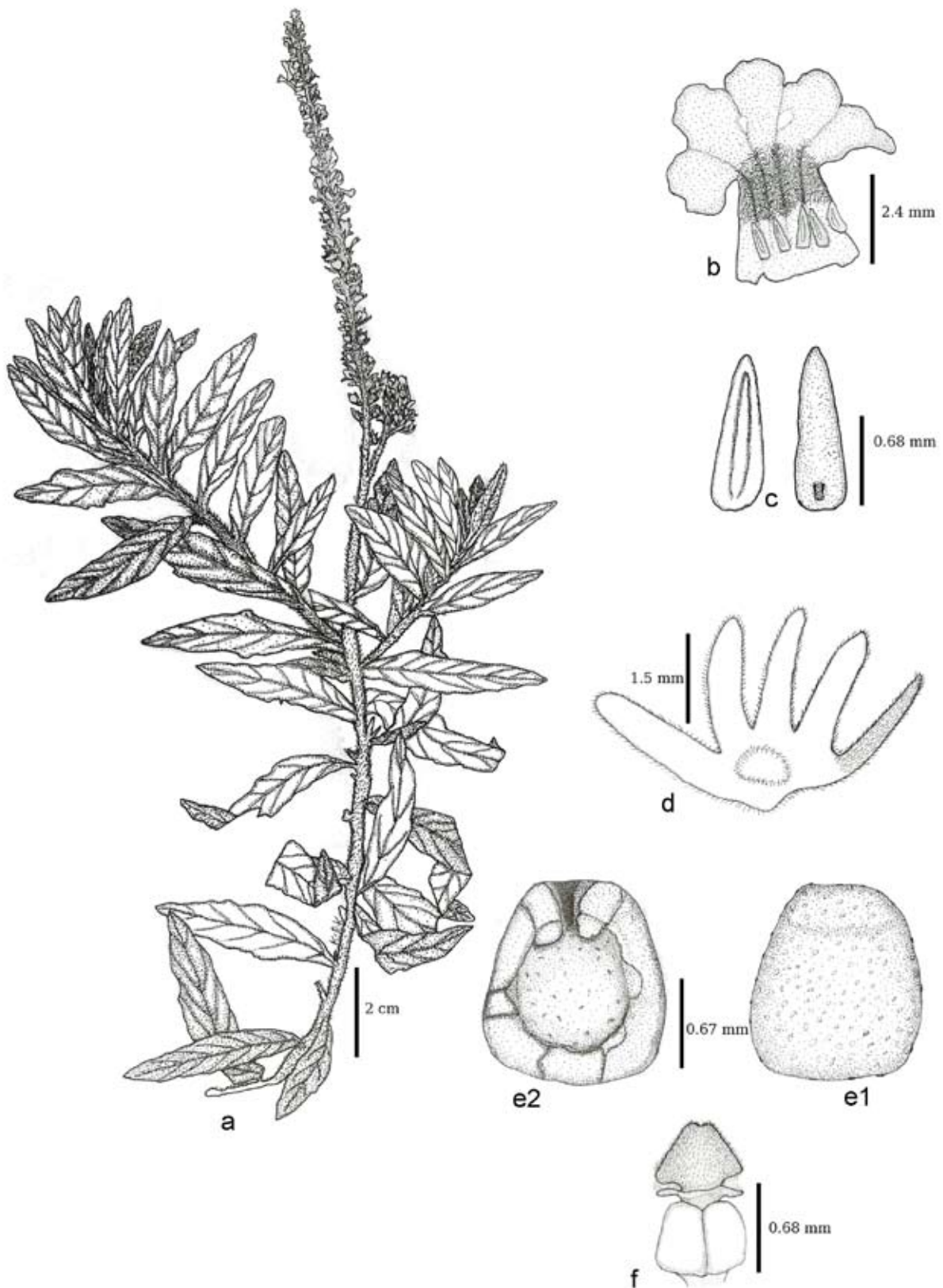


Fig. 1. *Heliotropium amplexicaule* Vahl: **a.** Habit; **b.** Corolla opened; **c.** Calyx opened; **e1.** Seed dorsal view; **e2.** Seed ventral view; **f.** Pistil.



Fig. 2. *Heliotropium amplexicaule* Vahl: **a.** Habit; **b1 & b2.** Inflorescence; **c.** Infructescence; **d.** Corolla split open; **e.** Pistil; **f.** Seeds.

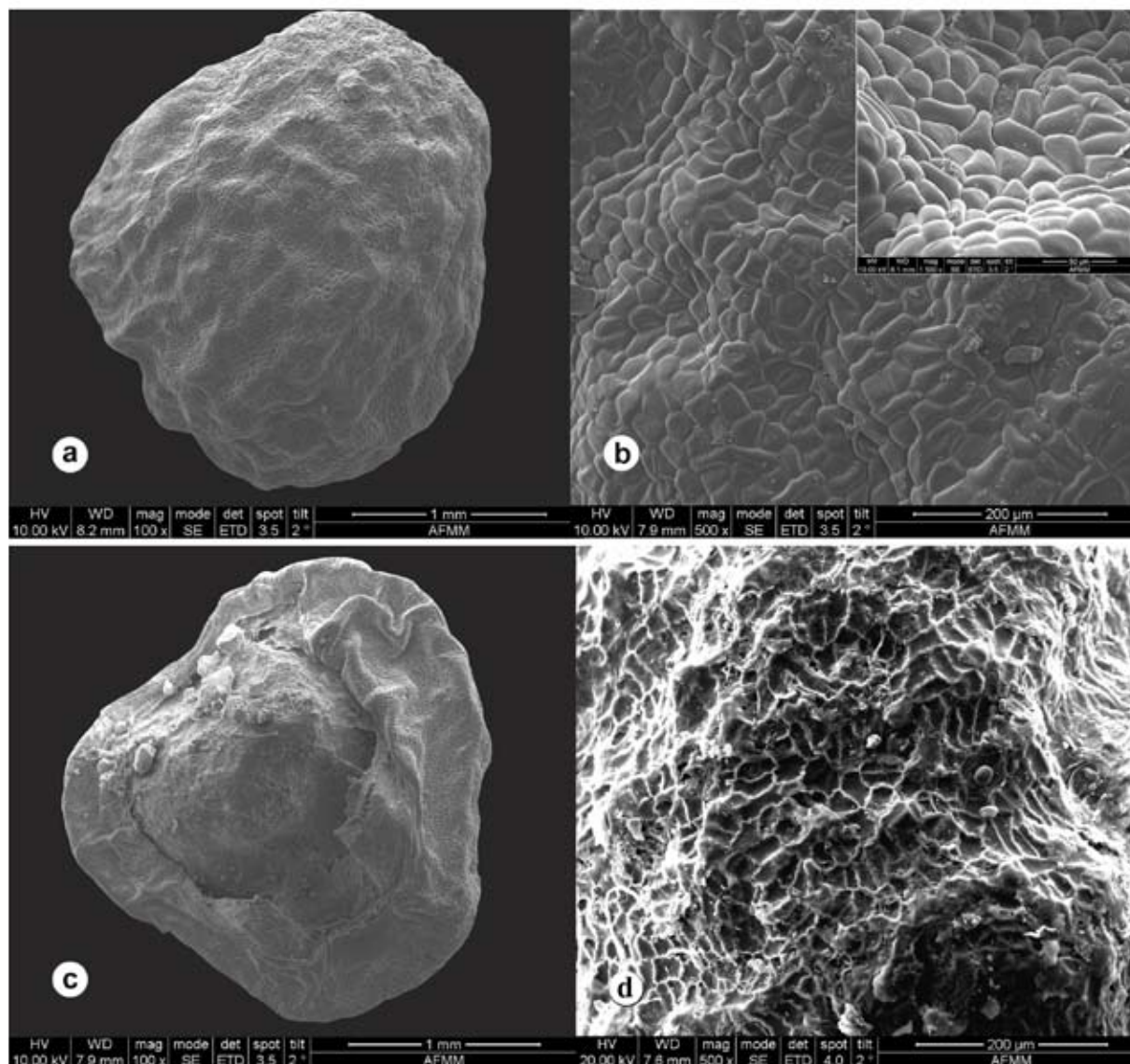


Fig. 3. *Heliotropium amplexicaule* Vahl SEM Pictures showing the seed surface ornamentation: **a.** Outer view; **b.** Testa surface, inset showing the fine structure; **c.** Inner view showing the hilum; **d.** Hilum surface.

white, oblong-lanceolate, *c.* 1.2 mm long, sessile, adhered to the base of the tube, introrse. Ovary green, *c.* 0.5 mm long, glabrous; style minute; stigma conical, strigose hairy. Fruits of 2 bilocular nutlets, glabrous, dark green when mature, turning black when dry enclosed in persistent calyx. Seeds discoid, *c.* 1.5 mm across, plano-convex; testa hard, rough, dark; hilum pitted, reticulate.

Flowering & Fruiting: Throughout the year.

Habitat: Dry to semi-arid locations.

Distribution: Tropical America, Africa, Australia, India, Malaysia and South-east Asia

Specimens examined: INDIA, Karnataka, Bangalore, IISc campus, 15.9.2014, 13° 01' 54.4''N and 77° 56' 70''E, 940 m KRKS, AS & SR 0138 (Herbarium, JCB Centre for Ecological Sciences IISc, Bangalore). USA, South Carolina, Edgefield County, June 1996, A.E.Radford 44810, (CAL). BOLIVIA, Vicinity of Cochabamba, 1891, *Bang Miguel* 926 (MO), MO: 694704, Type. 2516390.

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Microanalysis (AFMM) of IISc is thanked for the SEM pictures. Central National Herbarium (CAL), Howrah, India is acknowledged for validation of identification. One of the authors, Raja Kullayi Swamy thanks the DBT-IISc Partnership Program for Advance Research in Biological Sciences and Bioengineering, IISc for the fellowship.

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