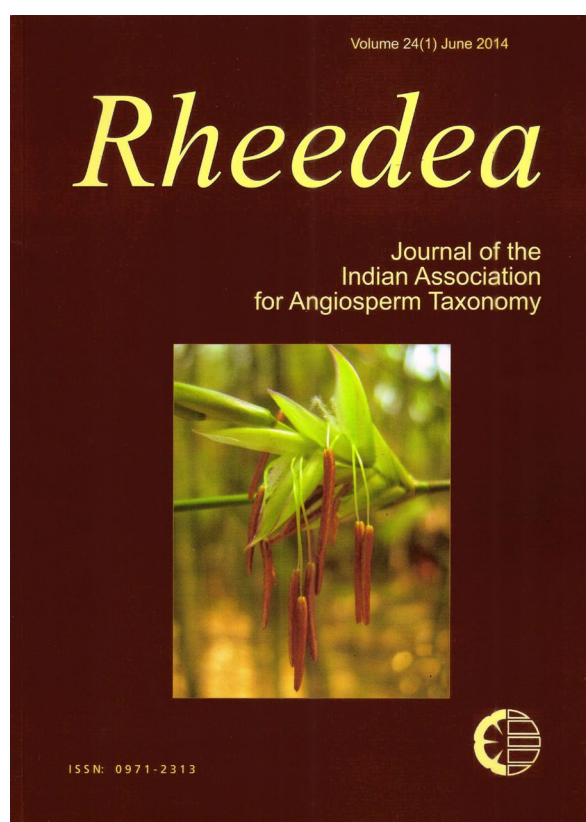




## Taxonomic reinstatement of an endemic *Hygrophila* (Acanthaceae) subsequent to its rediscovery after 180 years from India

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# Taxonomic reinstatement of an endemic *Hygrophila* (Acanthaceae) subsequent to its rediscovery after 180 years from India

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## Abstract

*Hygrophila balsamica* var. *thymus* (Nees) Karthik. & Moorthy has been rediscovered after a span of 180 years from Tirunelveli, South India. Due to the unique character combination, its species status is reinstated and therefore a new combination, *H. thymus* (Nees) Sunojk. & M.G. Prasad is proposed.

**Keywords:** *Hygrophila thymus*, endemic, new combination, rediscovery after 180 years, critically endangered, Tamil Nadu, Tirunelveli

## Introduction

The genus *Hygrophila* R.Br. comprises about 100 species, mainly distributed in tropical and subtropical regions of the world (Jiaqi *et al.*, 2009). In India the genus is represented by 18 species and 6 varieties (Karthikeyan *et al.*, 2009).

While collecting plants for a taxonomic study of Acanthaceae in South India, we came across a small population of *Hygrophila* characterized by small size, spreading nature and narrow leaves at the scrub jungles in Tirunelveli district of Tamil Nadu. After checking type specimens of all the *Hygrophila* species described so far from India, it well matches the type of *Adenosma thymus* Nees (Wall. Cat. No. 2380 B (K000882371) photographs!). *Adenosma thymus* was subsequently treated as a variety (var. *thymus*) of *Cardanthera balsamica* by Clarke (1884–85) and *H. balsamica* var. *thymus* (Nees) by Karthikeyan *et al.* (2009). However, *H. balsamica* var. *thymus* is strikingly different from the typical variety *balsamica* in having non-heterophyllous foliage, short creeping growth habit, ascending branches and in few other floral characters (see Table 1).

The plants were also grown in the Botanical Garden of Calicut University for two years in aquatic as well as in wet soil. The plants never showed any heterophylly and the submerged leaves underwent decay, a condition different from *H. balsamica*. The extend of variation on leaf dimorphism, level of serration or lobation observed in *H. balsamica*, both

in wild and cultivation were studied based on several herbarium specimens and photographs of types (C10004893 to 95) and the authors were not able to see any intermediate forms.

A critical study showed many character differences between these taxa, which the earlier workers could not have recognized. The differences found on vegetative and floral characters convince us to conclude that var. *thymus* deserve a specific status and is reinstated here following Nees (1832) and Bentham (1847) and a new combination *Hygrophila thymus* (Nees) Sunojk. & M.G. Prasad, is proposed.

**Taxonomic history:** Nees (1832) described *Adenosma thymus* based on a specimen collected by Benjamin Heyne from Deccan peninsula, India (Wall. Cat. No. 2380 B). Bentham (1847) and Anderson (1867) followed Nees (*l.c.*) in using the name *Adenosma thymus*. Later, Clarke (1884–85) reduced *Adenosma thymus* as a variety of *Cardanthera balsamica* and remarked “it is certainly a starved specimen of *C. balsamica*”. It appears that no additional specimens of this taxon were cited in the literature and the differences observed by Clarke are probably based on a single herbarium sheet.

Thereafter, mention of this variety could not be observed in any taxonomic works related to South India. No new specimens were added with

this name in any herbarium since the collection of type materials and the var. *thymus* were not mentioned in any floristic accounts published later on. Recently, a combination of this variety under *Hygrophila* was made by Karthikeyan *et al.* (2009) in their compilation checklist on Flowering Plants of India.

The present collection, hence, form a rediscovery of this taxon after a span of 180 years of its first collection. Here a detailed description supported by illustrations and diagnostic characters are provided to facilitate comparison and easy identification.

***Hygrophila thymus* (Nees) Sunojk. & M.G. Prasad, comb. nov.**

*Adenosma thymus* Nees in Wall., Pl. Asiat. Rar. 3: 79. 1832; Benth. in DC. Prodr. 11: 69. 1847, excl. syn.; T. Anders., J. Linn. Soc. Bot. 9: 454. 1867.

*Cardanthera balsamica* (Linn.f.) Benth. ex C.B. Clarke var. *thymus* (Nees) C.B. Clarke in Hook.f., Fl. Brit. India 4: 404. 1884–85.

*Hygrophila balsamica* (Linn.f.) Raf. var. *thymus* (Nees) Karthik. & Moorthy in Karthik. *et al.*, Fl. Pl. India 1: 21. 2009.

*Typus*: INDIA, B. Heyne ex Wall. Cat. No. 2380B (holotype, K-W photographs!) **Fig.1**

A slender, diffuse, trailing herb, spreads up to 20 cm long; branches ascending. Stem quadrangular, glabrous, nodes slightly pulvinous, internodes 1.5–1.8 cm long. Leaves opposite, homophyllous, sessile; blades oblong-linear, 1.5–1.8 × 0.3–0.4 cm,

glabrous, apex acute, base tapering, margins entire at base, shallowly serrate towards apex; veins pinnate, 6–7 on each side. Inflorescence axillary cymes, seen towards apex; peduncles *c.* 1 mm long, glabrous; bracteoles 2, *c.* 3.5 × 1 mm, glabrous. Flowers violet, sessile, 8–9 mm long; Calyx *c.* 5 mm long, deeply 5-lobed, slightly pubescent, lobes unequal, lanceolate with non ciliate margin, upper middle lobe shorter, *c.* 3.5 × 0.5 mm, other lobes *c.* 5 × 0.8 mm, basally joined. Corolla blipped, tube 4–5 mm long, funnel-shaped, slightly pubescent outside, glabrous inside except some glandular hairs on the lower lip, upper lip longitudinally 3-nerved, slightly emarginate at apex, *c.* 4 × 3 mm, dull white, lower lip *c.* 4 × 4 mm, 3-lobed at apex, pale violet with dark pink cross lines, glandular hairs towards base. Stamens 4, didynamous; upper two shorter, *c.* 3.5 mm long; lower two longer, *c.* 5.2 mm long; anthers *c.* 1.2 mm long, longitudinally splits open. Ovary oblong-elliptic, *c.* 2.2 mm long, style *c.* 5 mm long, pubescent; stigma simple. Fruit *c.* 6 mm long, oblong, acute at apex, sparsely minute hairy towards upper side, fruiting calyx equaling the length of fruit. Seeds minute, ovate, flat, 0.4 × 0.2 mm, glabrous, black.

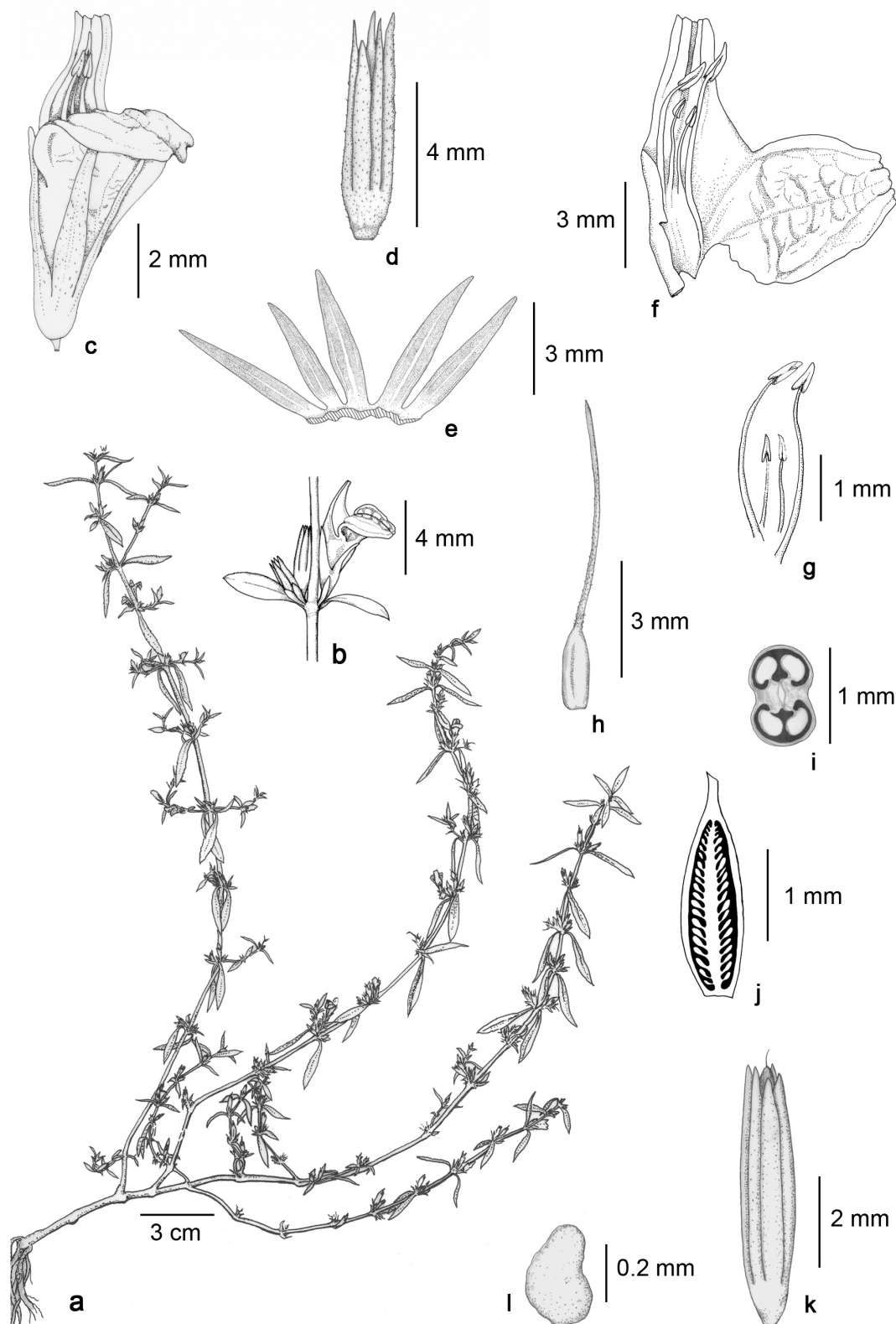
*Flowering & Fruiting*: January – March (Flowering noticed up to July in the Botanical Garden)

*Specimen examined*: INDIA. **Tamil Nadu**, Thirunelveli district, Vijayanarayanam, 40 m, 9 March 2011, Sunojkumar & M.G. Prasad CU 88157 (CALI).

*Conservation status*: Based on IUCN Red List criteria (IUCN, 2001), *Hygrophila thymus* can be given

**Table 1.** Comparison of *H. balsamica* and *H. thymus*.

Characters	<i>H. balsamica</i>	<i>H. thymus</i>
Habitat	Aquatic, mostly submerged	Wet sandy soil
Habit	Erect viscid herb, up to 80–100 cm tall	Diffuse non-viscid trailing herb, spreads up to 15–20 cm long
Leaves	Heterophyllous, 3–5 × 0.75–2.5 cm, margin serrate or deeply lobed or pinnatifid, aromatic, petiolate	Homophyllous, 1.5–1.8 × 0.3–0.4 cm, margin entire at base and obscurely serrate towards apex, non aromatic, sessile
Sessile glands on leaves	Present	Absent
Calyx lobes	Ob lanceolate, margin ciliate; upper middle lobe <i>c.</i> 8 × 3 mm, larger than others (6 × 1 mm)	Lanceolate, margin not ciliate; upper middle one <i>c.</i> 3 × 0.5 mm, smaller than others (5 × 0.8 mm)
Corolla tube	6–7 mm long	4–5 mm long



**Fig. 1.** *Hygrophila thymus* (Nees) Sunojk. & M.G. Prasad: **a.** Habit; **b.** A portion enlarged; **c.** Flower; **d.** Calyx; **e.** Calyx split opened; **f.** Corolla split opened; **g.** Stamens; **h.** Gynoecium; **i.** Ovary C.S.; **j.** Ovary L.S.; **k.** Fruit with persistent calyx; **l.** Seed (all drawn from Sunojkumar & M.G. Prasad CU 88157).

the conservation status of Critically Endangered (CR B1ab [ii,iii]) due to its restricted distribution, habitat loss and population size.

*Distribution:* Endemic to South India.

*Ecology:* This elegant herb was found growing on wet sand soil in the scrub jungle areas just after rainy season. It was seen associated with other herbaceous taxa such as *Lindernia parviflora* (Roxb.) Haines, *Limnophila indica* (Linn.) Druce, *Striga angustifolia* (D. Don) Saldanha, *Basilicum polystachyon* (Linn.) Moench, *Stemodia viscosa* Roxb., etc.

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