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A new species of *Nymphoides* Séguier (Menyanthaceae) from the lateritic plateau of South India

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ABSTRACT: *Nymphoides palyii*, a remarkable new species collected from the seasonal pond in South India is described and illustrated. The new species shows resemblance with *Nymphoides parvifolia*, but easily distinguished from the later by the glabrous nature of seed without tubercles and absence of hairs at the throat of corolla tube.

KEY WORDS: Menyanthaceae, New species, *Nymphoides palyii*, South India.

INTRODUCTION

Nymphoides Séguier is a widely distributed genus in the wetlands of tropical and temperate regions of world. It is the largest genus of the family Menyanthaceae with 40 species (Li *et al*., 2002). Sivarajan *et al.* (1993) and Gupta *et al.* (2000) identified eight species from India during their revision works. The ponds of lateritic plateau of South India show three species of Nymphoides Séguier, namely Nymphoides indica (L.) Kuntze, Nymphoides parvifolia Kuntze., and Nymphoides krishnakesara Joseph & Sivar.

The authors collected a very interesting specimen of *Nymphoides* Séguier from a pond in the lateritic plateau of North Malabar, south India. The flowers and seeds of the specimen are very distinct from all other species of *Nymphoides* Séguier. Hence it is described as a new species.

TAXONOMIC TREATMENT

Nymphoides palyii Biju, Josekutty, Haneef & Augustine J., ***sp. nov.*** **Figs. 1 & 2**

Type: INDIA. Kerala: Kasragod District, Perla lateritic plateau, N12°36'17.8", E075°00'5.5", 86 m, 12 August 2014, *Biju & Jomy 2482* (holotype CAL (Central National Herbarium, Howrah), isotype MH (Madras Herbarium, Coimbatore).

Aquaticannual, rhizomatous herbs; Rhizome vertical, 2–2.5 cm long, obconical. Leaves dimorphic; basal leaves submerged, in rosette, spathulate; petiole 2–3.6 cm long, green, terete; lamina ovate-rhomboid, 2–2.5 × 1.2–1.5 cm, glabrous, margins distantly crenate, round at apex. Fertile branches many, arise from the axil of submerged leaves, 15–40 cm long, length highly variable with depth of the water, green, terete, dialated at tip, uniphyllous; floating leaves ovate, dark green; glabrous; 1.4–1.6 × 1.5–1.7 cm; petiole 2–4 mm long, spongy, grooved on the dorsal side, deeply cordate at base with broad triangular sinus, round at apex, crenate; veins obscure. Flowers bisexual, tetramerous or trimerous (25%), in fascicles of 4–9 at the junction of petiole and branches, protected by wing like outgrowth arise from the leaf base; bracts membranous, 1.4–2 × 1.5–2 mm, light green, irregularly lobed; pedicels green, terete, 4–6mm long. Sepals 4(-3), green with pinkish apex, 2–2.5 × 0.75–1 mm, glabrous, basally united, valvate, elliptic-lanceolate, acute at apex, margins hyaline. Corolla rotate, white, corolla tube short, 0.8–1.1 mm long; lobes 4(-3), 2.5–3 × 1–1.3 mm, ovate-lanceolate, glabrous, distinctly veined at the centre; margins involute towards apex, minutely fimbriate towards the apex, thinly hairy towards the base; throat yellowish, stamens 4(-3), epipetalous, bithecous, inserted inside the corolla tube, projects much above the sinus of corolla lobes; anthers cream colored, 0.4–0.5 × 0.3–0.4 mm, filaments 1–1.2 × 0.1–0.2 mm, connective projects beyond the anther lobes as a small protuberance; Inter staminal stalked glands are absent. Carpels bottle shaped, green; ovary 0.8–0.9 × 0.6–0.7 mm, obovate-oblong; style 0.3–0.4 mm, green, terete, persistent; stigma lobes 2, lamellate, glandular. Capsule oblong, 3.5–4 × 1.5–2 mm, double the length of fruiting calyx; stalk up to 6mm. Seeds 4–10, discoid, brownish black, glabrous, 0.8–0.9 mm across, smooth.

Vernacular name: Kuruneyyambal.

Phenology: The flowering and fruiting occurs during July-November.

Etymology: The new species is named to honor Prof. Joseph Paly, former professor of Systematic Botany, St. Thomas College, Pala, India.

Similar species: The *Nymphoides palyii* is closely allied to *Nymphoides parvifolia* in the characters of

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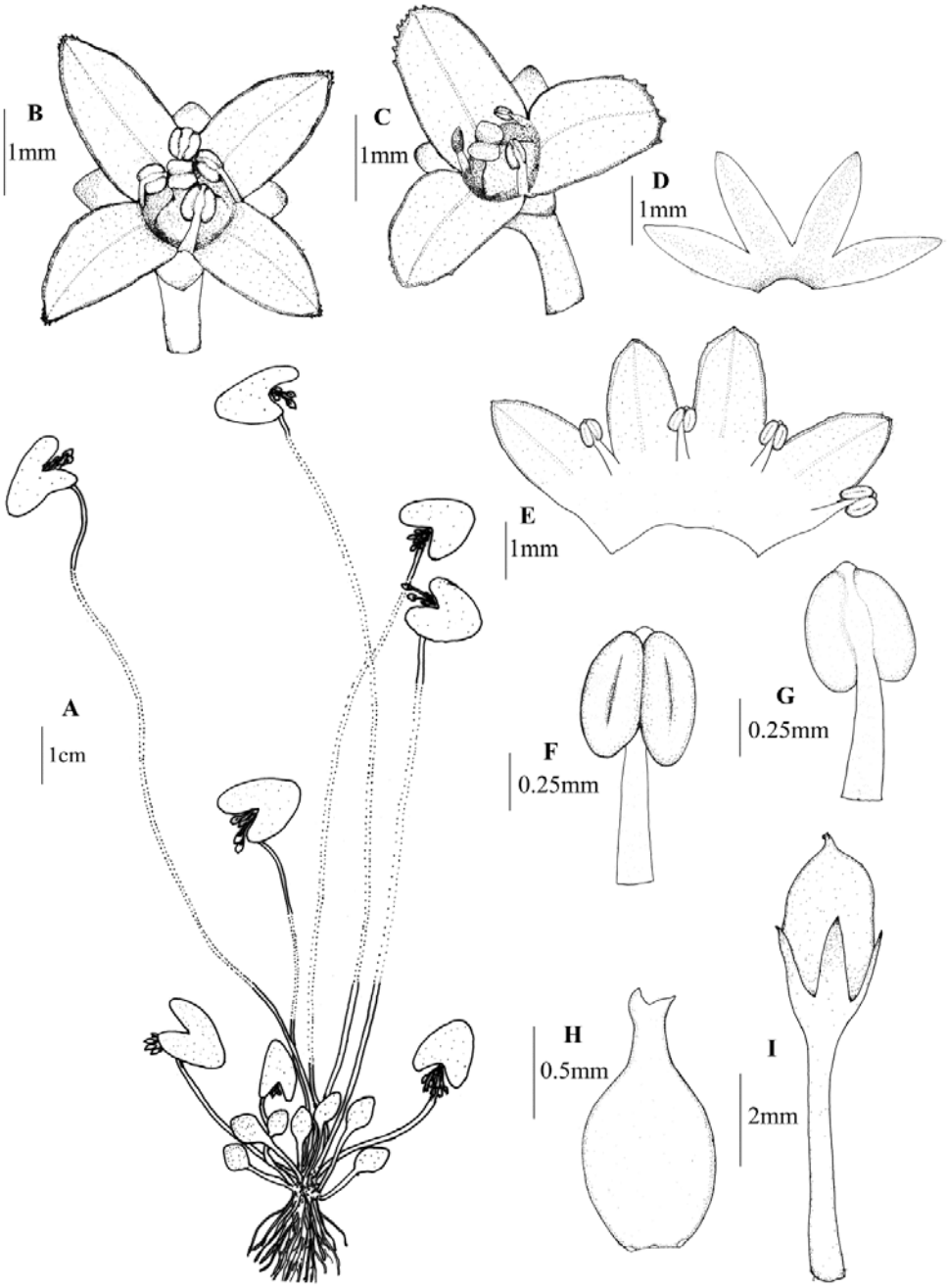


Fig. 1. ***Nymphoides palyii*** Biju, Josekutty, Haneef & Augustine J. sp. nov. **A:** Habit. **B:** Tetramerous flower. **C:** Trimerous flower. **D:** Calyx. **E:** Opened corolla showing stamens. **F & G:** Stamen. **H:** Carpel. **I:** Fruit.

calyx, corolla, carpel and fruit, but differs in many characters shown in Table 1.

Ecology: The new species grows in a shallow pond in the lateritic hillocks of Perla, Kerala, India. The plant grows in association with *Microcarpaea minima* (K.D. Koenig ex Retz.) Merr., *Ludwigia hyssopifolia* (G. Don) Exell., *Eriocaulon cuspidatum* Dalz., and *Wiesneria triandra* (Dalz.) Micheli. The pond begins to dry up after the monsoon rains. The *Nymphoides palyii* survives for 2–3 months in the thick growth of *Microcarpaea minima* (K.D. Koenig ex Retz.) Merr. at the muddy bottom.

Distribution: The new species is restricted to a seasonal pond in the lateritic hillocks of Perla, Kasaragod, Kerala, India (Fig. 3.).

Conservation status: The new species is distributed in a seasonal pond at Perla, Kasaragod, Kerala, India. The shallow pond dry out in the month of November and the local people use this area as playground. Hence quick conservation steps should be taken for the protection of this rare endemic species.

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Table 1. Distinguishing features of ***Nymphoides parvifolia*** Kuntze. and ***Nymphoides palyii*** Biju, Josekutty, Haneef & Augustine J.

Characters	*Nymphoides parvifolia*	*Nymphoides palyii*
Leaves	Leaves larger, 3–3.5 × 1.5–2 cm, pale green–brownish green with pinkish tinge, leathery; veins distinct; lamina longer, narrow triangular sinus	Leaves small, 1.4–1.6 × 1.5–1.7 cm, dark green, glabrous, veins obscure; lamina broader, broad triangular sinus
Flower	Flowers tetramerous or pentamerous	Flowers tetramerous or trimerous (25%)
Corolla	Corolla lobes 3–5 mm; veins not distinct, margins fimbriately toothed towards the apex, hairs absent at the base, a ring of hyaline hairs present at the throat. Corolla tube with stalked glands alternating with stamens	Corolla lobes up to 2.5–3 mm, distinctly veined at the centre, glabrous, margins involute towards apex, minutely fimbriate towards apex, few thin unbranched harirs present towards the base. Hairs absent at the throat. Stalked glands absent
Anther	Connective not projecting beyond anther lobes	Connective projects beyond anther lobes
Carpel	Hypogynous glands present	Hypogynous glands not distinct
Seeds	8-15, testa cells foveolate, surface tuberculate	4-10, Testa cells not foveolate, glabrous, surface not tuberculate.

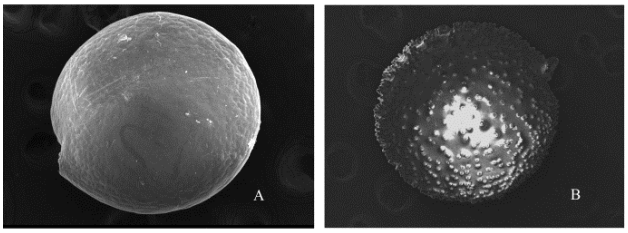


Fig. 2. Scanning electron micrographs of seeds; **A:** ***Nymphoides palyii*** Biju, Josekutty, Haneef & Augustine J. **B:** ***Nymphoides parvifolia*** Kuntze.



Fig. 3. The distribution of ***Nymphoides palyii*** Biju, Josekutty, Haneef & Augustine J. in India.

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