



A review of the genus *Taeniophyllum* (Orchidaceae) in Andaman and Nicobar Islands (India) with the description of a new species, *Taeniophyllum wrightmyoensis*

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Key Words

Aeridinae
New species
Orchidaceae
Taeniophyllum
South Andaman

Abstract A new species, *Taeniophyllum wrightmyoensis* (Orchidaceae) is described from the Andaman and Nicobar Islands, India. The new species resembles *T. hasseltii* and *T. pusillum*, but is distinct from both in having mostly terete free hanging roots (versus roots flat, appressed to the substratum), bracts lax (versus bracts close in *T. pusillum*), lip without any cushions (versus lip with convex cushions in *T. hasseltii*) and a conical spur (versus globose spur in *T. pusillum*). In addition, a review of other species of the genus *Taeniophyllum* reported from the Andaman and Nicobar Islands is provided with an identification key.

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INTRODUCTION

Taeniophyllum Blume is one of the largest genera in the subtribe *Aeridinae* of the *Orchidaceae* with about 251 currently accepted species (POWO continuously updated). It is a group of small monopodial, leafless epiphytic orchids with a minute central stem and four divided pollinia. The generic name denotes the tapeworm like long roots. The roots are green and contain chlorophyll that performs photosynthesis, while the true leaves are reduced to tiny scales covering the stem. (Carr 1932, Seidenfaden 1988, Seidenfaden & Wood 1992, Comber 2001). *Taeniophyllum* was divided into two subgenera based on having sepals and petals that are connate or free at the base; these subgenera were further subdivided into six sections (Schlechter 1913). The genus is widely distributed from tropical Africa through tropical Asia to Australia and Pacific islands, with a center of diversity in New Guinea (Pridgeon et al. 2014, POWO continuously updated). In India, ten species have been recorded (Singh et al. 2020) including *T. andamanicum* N.P.Balacr. & N.Bhargava and *T. filiforme* J.J.Sm. reported from Andaman and Nicobar Islands (Balakrishnan & Bhargava 1979, Pandey & Diwakar 2008, Karthigeyan et al. 2014). In the neighbouring regions, the genus is represented by one species in Myanmar, eight species in Thailand, 16 species in Peninsular Malaysia and nine species in Sumatra (Comber 2001, Aung et al. 2020, Chantanaorrapint et al. 2023).

The Andaman and Nicobar Islands are the largest archipelago ecosystem in the Bay of Bengal, consisting of 572 islands and islets. Being situated in two major biodiversity hotspots, namely

the Indo-Burma and Sundaland Biodiversity Hotspots, endows it with an unmatched distribution of plants with representatives of Myanmar and Malesian floras (Balakrishnan & Ellis 1996). The Andaman and Nicobar Islands harbour about 158 orchid species, of which 23 species (14.5%) are endemic (Karthigeyan et al. 2012, 2014, Singh et al. 2019).

During a botanical exploration on the island of South Andaman, a few specimens belonging to the genus *Taeniophyllum* were collected from the western slopes of Mt. Harriet Hill Ranges near Wrightmyo and Wimberlygunj. These specimens were compared with the species known from India and neighbouring countries. On examination of herbarium specimens and perusal of relevant literature (Seidenfaden 1988, Seidenfaden & Wood 1992, Comber 1990, 2001, Singh et al. 2020), it was found that these specimens represent an undescribed species.

MATERIALS AND METHODS

Specimens were studied in the field as well as in the herbaria. The description is based on measurements of living plants taken in the field and of herbarium specimens. Dried herbarium specimens and specimens collected in FAA (Alcohol 70% + Acetic acid 5% + Formaldehyde 5% + Distilled water 20%) solution were studied using a trinocular microscope. Herbarium specimens present at CAL, E, K, L, MW, PBL, PE, SING, US (herbarium acronyms follow Thiers continuously updated) were examined and viewed online via IAPT digital herbaria, JSTOR (continuously updated) or the websites of individual herbaria (SING: <https://herbaria.plants.ox.ac.uk> ›bol ›sing; PE: <http://pe.ibcas.ac.cn/>). A specimen seen as a digital image is indicated by an asterisk (*) and those seen in the herbarium by '!'.

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TAXONOMY

Taeniophyllum wrightmyoensis Alappatt, sp. nov. — Fig. 1–2; Table 1–2

This species is similar to *Taeniophyllum hasseltii* Rchb.f. and *T. pusillum* (Willd.) Seidenf. & Ormerod in having free sepals and petals, distichous bracts, fleshy lip and short anther-beak, but differs from them by its mostly free hanging terete roots and a few roots semi-terete when appressed to substratum (vs. roots flat, appressed to the substratum), bracts lax (vs. close in *T. pusillum*), comparatively smaller flowers (c. 3 mm across), not opening widely (vs. large flowers, 5–5.5 mm across, opening widely), lip blade without convex cushions (vs. with convex cushions in *T. hasseltii*), spur conical, being longer than broad (vs. globose, as long as broad in *T. pusillum*). — Type: Joju P. Alappatt 540 (holo PBL [PBL0000064584]; iso PBL [PBL0000064587]) India, Andaman and Nicobar Islands, South Andaman, Wrightmyo, Kalatang, western slopes of Mt. Harriet Hill Ranges, elevation ± 20 m., 12 Jul. 2013.

Etymology. The specific epithet refers to the collections from Wrightmyo where the species was discovered.

Epiphytic herb, up to 1.5 cm high, monopodial. *Roots* radiating, spreading, mostly hanging free from the stem, some appressed, on tips of branchlets, terete in free hanging roots, semi-terete when appressed to substratum, green in rainy season, shrinking and greyish in dry season, up to 20 cm long, c. 1 mm in diameter. *Stem* up to 1.5 cm long. *Leaves* absent or reduced to tiny brown scales. *Inflorescences* 1–4 per plant, erect, lateral, short, up to 3 cm long; peduncle short, c. 5 mm long; rachis zig-zag from base, 10–25 mm long, c. 0.5 mm in diameter, minutely muriculate, internodes c. 2 mm long. *Flowers* 1–3 (6–8) per inflorescence, opening in succession, usually one at a time or sometimes 2 at a time; floral bracts persistent, distichous, up to 2 mm apart, ovate-triangular, c. 1.3 by 0.8 mm, slightly

scabrous, apex acute; flowers white, non-resupinate, lasting only a day, c. 3 mm across (wide), not widely opening, slightly fleshy; pedicel with ovary 3–5 mm long. *Sepals* without distinct veins; dorsal sepal concave, obovate, c. 2.4 by 1.4 mm; lateral sepals elliptic to obovate, c. 2.5 by 1.3 mm, apex acute. *Petals* elliptic to obovate, c. 2.3 by 1.2 mm. *Lip* spurred, entire, white, attached to base of column, thick and fleshy, deeply concave with raised sides and truncate at the apex, 2–2.4 by c. 1.5 mm; spur conical, 2–2.5 by c. 1.2 mm, pale yellow at apex. *Column* short, stout, footless, flat at front, c. 1.1 by 0.8 mm; anther cap terminal, c. 0.7 by 0.9 mm; pollinia 4, pyriform, equal, c. 0.5 by 0.4 mm, white turning yellowish, waxy, separate from each other, with a common stipe. *Capsule* cylindrical, 15–17 by c. 2 mm, with obscure longitudinal ridges.

Distribution — Endemic to Andaman and Nicobar Islands (South Andaman Island). (Map 1).

Habitat and ecology — The new species is distributed in lowland evergreen forests, found epiphytic at the tips of branchlets of *Terminalia procera* Roxb. (*Combretaceae*) and *Elaeocarpus rugosus* Roxb. ex G. Don (*Elaeocarpaceae*) at elevations of 20–30 m with annual rainfall of 2000–3000 mm. Flowering and fruiting: July to August.

Notes — *Taeniophyllum wrightmyoensis* can be best accommodated in subgenus (*Eu-*)*Taeniophyllum* and section *Brachyanthera* Schltr., because the sepals and petals are free, bracts distichous and anther with short beak. The new species resembles *T. hasseltii* (distributed in Peninsular Thailand, Peninsular Malaysia, Java to Christmas Islands) and *T. pusillum* (known from China to W. Malesia) in its habit, structure of sepals and petals and lip but differs from both in the features listed in Table 1. A comparison of the species with its other congeners in the islands is given in Table 2.



Fig. 1 *Taeniophyllum wrightmyoensis* Alappatt sp. nov., with *Oberonia ensiformis* (Sm.) Lindl. to the right. Photo: Alappatt.

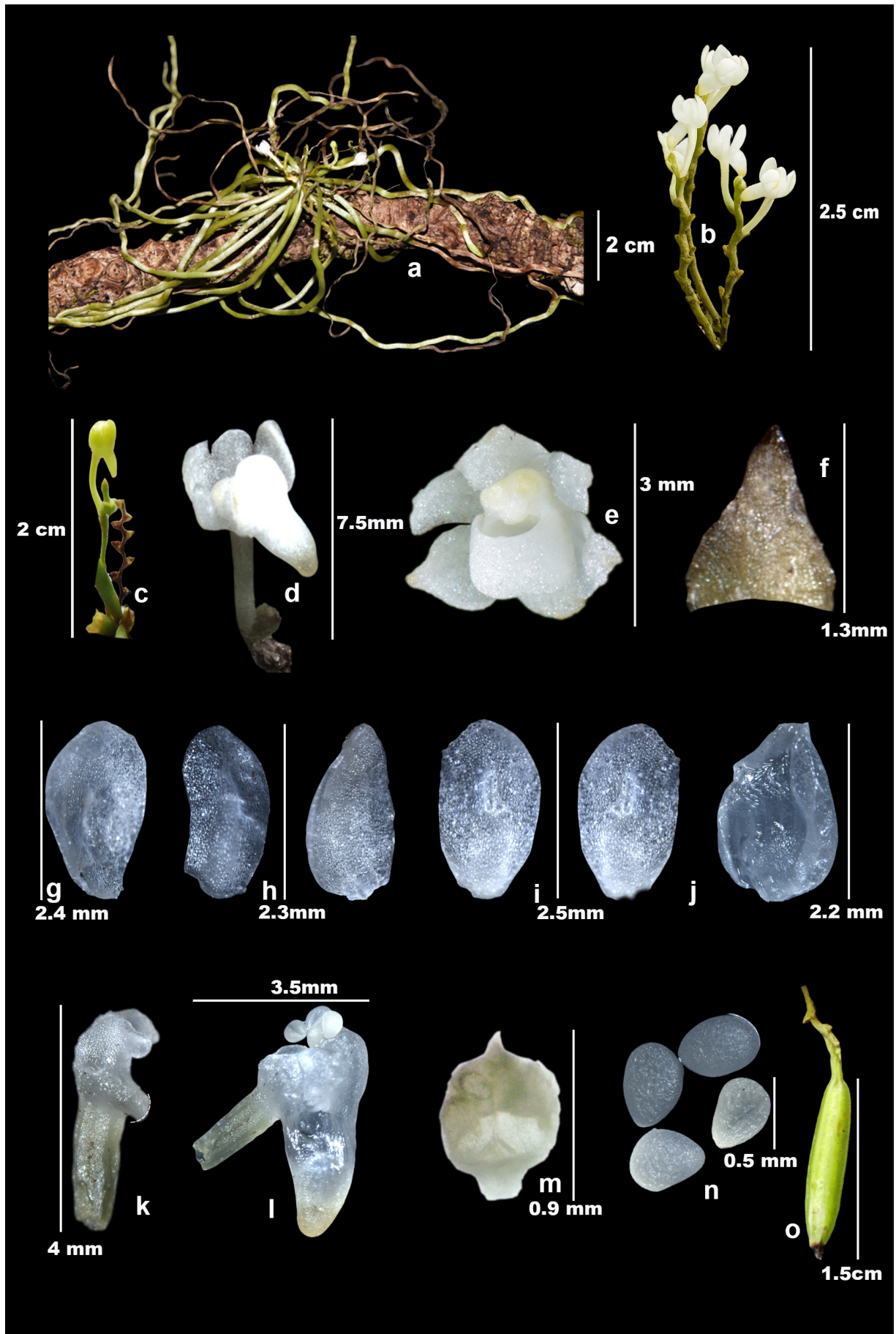


Fig. 2 *Taeniophyllum wrightmyoensis* Alappatt sp. nov. **a.** Habit. **b.** Inflorescence. **c.** Flower bud with inflorescence rachis of previous year. **d.** Flower, lateral view. **e.** Flower close-up, front view. **f.** Bract. **g.** Dorsal sepal. **h.** Petals. **i.** Lateral sepals. **j.** Lip. **k.** Column with ovary. **l.** column with ovary and spur. **m.** Anther cap. **n.** Pollinia. **o.** Capsule. Photos: Alappatt.

Table 1 Comparison of differentiating characters of *Taeniophyllum wrightmyoensis* with the closely resembling species: *T. hasseltii* and *T. pusillum*.

Characters	<i>T. wrightmyoensis</i>	<i>T. hasseltii</i>	<i>T. pusillum</i>
Roots	terete, free from the substratum or semi-terete when appressed to substratum	flat, appressed to the substratum	flat, appressed to the substratum
Rachis	minutely muricate, internode c. 2 mm long	minutely muricate, rough, internode c. 1.5 mm long	highly muricate, rough, internode less than 1 mm long
Bract	lax, more or less smooth, dark green turning yellowish brown when old	lax, rough, orange-brown when old	close, rough, brown
Flower	small, c. 3 mm wide, not opening widely	large, c. 5 mm wide, opening widely	large, c. 5.5 mm wide, opening widely
Perianth	white, concave	bright yellow, concave	yellow, flat to slightly concave
Lip	white, slightly fleshy, entire, deeply concave with raised sides and truncate at the apex	white with two violet spots, slightly fleshy, bluntly triangular; 3-lobed, mid lobe rounded, deeply concave, apex curved upward	white, very fleshy, cymbiform, hardly lobed, concave; sides raised and concave, apex not upcurved
Lip blade	lip blade without prominent cushions	lip blade with two prominent convex cushions	lip blade without prominent cushions
Spur	white, conical, longer than broad	yellow, conical, longer than broad	greenish, globose, as long as broad

Additional specimens examined (Paratypes)

Joju *P. Alappatt* 425 (PBL[PBL0000064585!]), India, South Andaman Island, Wimberlygunj on the western slope of Mt. Harriet Hill Ranges, elevation \pm 30 m., 23 Jul. 2012; Joju *P. Alappatt* 545 (PBL[PBL0000064586!]), 18 Jul. 2013.

KEY TO SPECIES OF *Taeniophyllum* FROM ANDAMAN AND NICOBAR ISLANDS

1. Sepals and petals connate at base..... *T. andamanicum*
1. Sepals and petals free 2
2. Scape very long (up to 5 cm), rachis with very closely placed bracts; apex of spur subglobose *T. filiform*
2. Scape short (up to 0.5 cm), rachis with distantly placed bracts; apex of spur acute *T. wrightmyoensis* sp. nov.

Taeniophyllum andamanicum N.P.Balakr. & Bhargava

Type: *Bhargava* 5932A (holo CAL); 5932B (iso PBL[PBL000000253!]), India, Andaman and Nicobar Islands, Baratang island, Nilambur, elevation \pm 20 m, 17 July 1977 (isotype).

Epiphytic leafless herbs. *Roots* long, sub-trigonous in cross section, greyish green. *Inflorescence* arising from the base, 7–15-flowered; peduncle 5–12 mm long, fleshy, spikes 5–13 mm long. *Flowers* light green turning to light cream to yellowish and finally to light blood-red; sepals and petals united in to a tube for more than half the length; lip free, narrowly lanceolate with hooked incurved apex; spur globose; column fleshy with 2 subulate obtuse fleshy incurved arms at base; operculum hyaline.

Distribution — The species is known only from the type locality in Baratang Island of the Andaman Islands, India (Map 1).

Habitat and ecology — The plant grows epiphytic on the end branchlets of *Tectona grandis* L. (*Lamiaceae*) in teak plantations near inland forests at elevations of \pm 20 m. Flowering and fruiting: July to August.

Taeniophyllum filiforme J.J. Sm.

Type:— *Unknown* s.n. (holo BO), [Indonesia,] Celebes, Bone, Gorontalo.

Epiphytic leafless herbs. *Roots* long, wiry, more or less cylindric, often free, green. *Inflorescence* arising from the base, 1–2-flowered; scape c. 5 cm long, slender, rachis up to 1 cm long. *Bracts* c. 1.5 mm long, membranous, very close, overlapping, 2-ranked. *Flowers* pale yellowish, c. 1 by 0.25 cm; sepals and petals free, nearly equal; lip fleshy, c. 3.8 by 2.5 mm, pale yellow, spur club-shaped; column c. 1mm long, with a long upwardly facing beak on the operculum.

Distribution — Thailand, Andaman Islands, Malay Peninsula, Sumatra, Borneo, Java, Sulawesi, Lesser Sunda Islands, and New Guinea. In the Andaman Islands the plant is so far known from only two locations, Rutland and Wrightmyo on South Andaman Island (Map 1).

Habitat and ecology — In inland forests, epiphytic on the tree trunks or on smaller twigs of large trees. Flowering and fruiting: June to August.

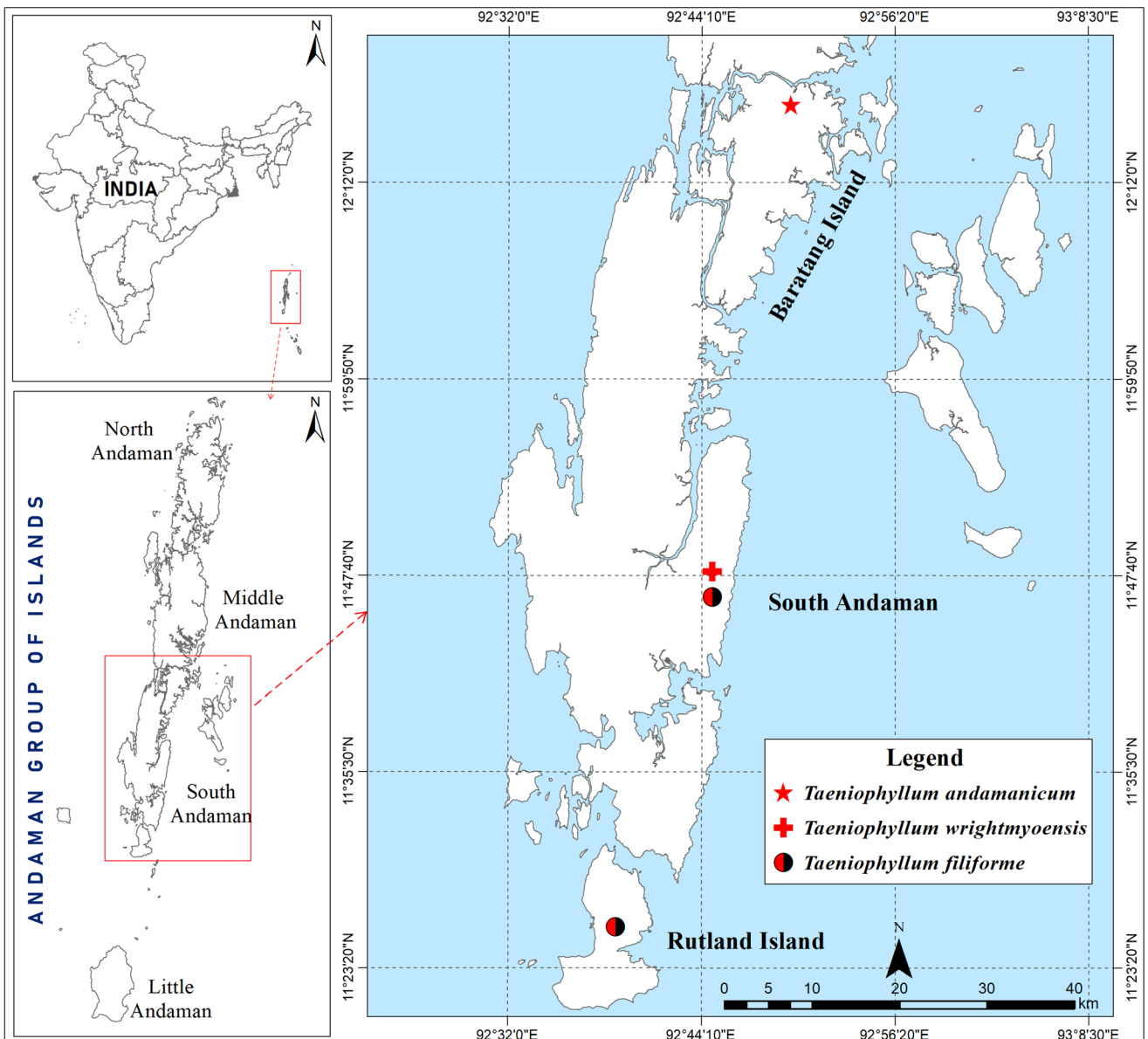
Additional specimens studied

Joju *P. Alappatt* 675 (PBL [PBL0000064588!]), India, South Andaman Island, Wimberlygunj on the western slopes of Mt. Harriet Hill Ranges, elevation \pm 30 m, 17 Jul. 2014; *K. Karthigeyan* 6086 (PBL), Rutland Island, 28 Jun. 2002; *Ong P.T.* 58860 (K [K000718517]*), Malaysia, Keda, Baling, 03 Feb. 2008; *AFG Kerr* 0336 (L [L1526631]*), Thailand, Ta Ngaw, Chumpawn, 16 January 1927.

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Table 2 Comparison of differentiating characters of *Taeniophyllum wrightmyoensis* with the other species from the Andamans: *T. andamanicum* and *T. filiforme*.

Characters	<i>T. wrightmyoensis</i>	<i>T. andamanicum</i>	<i>T. filiforme</i>
Roots	terete, free from substratum or semi-terete when appressed to substratum	terete, appressed to substratum	more or less terete, free from substratum
Peduncle	short, up to 0.5 cm long, not filiform	short, up to 1 cm long, not filiform	elongate, up to 5 cm long, filiform
Rachis	long, up to 2.5 cm long, minutely muricate	long, up to 1.5 cm long, glandular punctate	short, less than 1 cm long, slightly muricate
Bracts	lax, alternate	lax, alternate	very close, alternate
Flower	lasting for a day	lasting for 3–5 days	lasting for a day
Perianth	free, white	united, light green turning to yellow and light red	free, yellow
Lip	white, slightly fleshy, deeply concave with raised sides	yellowish green, wavy along lateral margins towards base, saccate at base with V-shaped slit	yellow, indistinctly 3-lobed, midlobe very fleshy, concave at base, apical part conical
Lip apex	truncate	hooked, incurved	obtuse



Map 1. Distribution of *Taeniophyllum* species in the Andaman islands (India).

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