



Thismia aurantiaca sp. nov. (section *Rodwaya*, *Thismiaceae*): First record of the family from Andaman and Nicobar Islands, India with a new species

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Key words

Andaman Islands
new record
new species
Rodwaya
Thismia
Thismiaceae

Abstract *Thismia* is a mycoheterotrophic genus in the family *Thismiaceae*. We report a new family record for Andaman and Nicobar Islands and a new species for India. A detailed description along with conservation assessment, colour photos, distribution map, and key to the species from India are provided.

Published on 5 September 2018

INTRODUCTION

Thismia Griff. is a poorly studied mycoheterotrophic genus (Mar & Saunders 2015) belonging to the family *Thismiaceae* with 62 taxa (WCSPF 2017) mainly distributed in warm temperate and tropical Asia, eastern and south-eastern Australia, New Zealand and the neotropics (Govaerts et al. 2007, Kumar et al. 2017). The major taxonomic characters used for species delimitation are the mitre, mitral appendages, perianth lobes and anther morphology, while Merckx & Smets (2014) showed that perianth appendages seem to have evolved multiple times independently.

Thismia is a taxonomically difficult genus because of its fungus-like tiny habit, delicate nature, short lifespan and because it is difficult to observe in the soil or amidst leaf litter. Recently researchers mainly from Asia and the Pacific region paid much attention to this genus and published several new species (Kiew 1999, Thiele & Jordan 2002, Yang et al. 2002, Tsukaya & Okada 2005, 2012, Larsen & Averyanov 2007, Chantanaorrapint & Sridith 2007, 2015, Chantanaorrapint 2008, 2012, Chantanaorrapint & Chantanaorrapint 2009, Ho et al. 2009, Chiang & Hsieh 2011, Dančák et al. 2013, Li & Bi 2013, Hunt et al. 2014, Truong et al. 2014, Nuraliev et al. 2014, 2015, Hroneš et al. 2015, Mar & Saunders 2015, Chantanaorrapint et al. 2015, 2016, Kumar et al. 2017, Sochor et al. 2017, Sujjanapal et al. 2017, Tsukaya et al. 2017). During a recent floristic expedition to Andaman and Nicobar Islands, MS & VSH observed a population of a peculiar orange tinged *Thismia* in the understory of evergreen forest of Mount Harriet National Park, South Andaman. Comparison with literature (Pfeiffer 1914, Roberts et al. 2003, Chiang & Hsieh 2011, Merckx & Smets 2014), revealed similarity with *T. rodwayi* F.Muell., with which it shares the orange coloured flower, more than 2 mm long outer perianth lobes, distally arching inward and apically broadly fused inner perianth lobes with mitre, vertical 1 mm long orange annulus with broad aperture and attachment

of stamens free from the annulus, but from which it differs in several features. Hence, it is here described as new species in sect. *Rodwaya*, with colour plates, distribution map, and a key to the species from India.

Thismia aurantiaca Hareesh & M.Sabu, sp. nov. — Fig. 1, 2; Map 1

This species is similar to *T. rodwayi* but differs from the latter in having outer perianth lobes 5 times larger than inner perianth lobes (vs sub-equal), broadly triangular recurved outer perianth lobes (vs spatulate, up-curved) and inner perianth lobes with minute 0.5 mm long, erect mitre (vs well developed more than 1 mm long, bent and inter locking mitre). — Type: M. Sabu & V.S. Hareesh 152774 (holo CALI; iso CAL, PBL), India, Andaman Islands, South Andaman, Mount Harriet National Park, elevation ± 320 m, 7 Aug. 2017.

Etymology. The name '*aurantiaca*' denotes the orange coloured flower of the plant.

Terrestrial, mycoheterotrophic erect herbs up to 9 cm tall. *Roots* clustered, prostrate, unbranched, pale yellow, vermiform, 5–15 by 0.5–1 mm, tapering towards apex. *Stem* erect, 15–25 by 1.75–2.5 mm at the base, c. 3.0 mm wide near the apex; unbranched, pale yellow to off white, somewhat translucent. *Leaves* alternate, 3–5, 4–5 by 1.5–2 mm, lanceolate, acute at apex, entire, translucent, white. *Involucral bract* 6–9 by 2–3 mm, narrowly triangular, acute at apex, glabrous, white. *Flowers* solitary, actinomorphic, 1.5–2.5 cm long, 6.5–7.5 mm wide, orange. *Pedice* 2–2.5 by c. 2.5 mm, terete, white; tepals fused to form a perianth tube with a whorl of 3 inner and 3 outer free apical perianth lobes. *Hypanthium* 10–15 by 5–10 mm obovoid, narrower towards base (c. 5 mm diam), wider above (c. 10 mm diam), white tinged with 12 depressed orange ribs of which 6 alternate ribs run from the base of the tube to the mouth of the annulus on the upper part of the perianth tube. *Annulus* c. 1 mm high, erect, forming a broad aperture, fleshy, orange. *Perianth*, 6 tepals in 2 whorls of 3 each, attached to the hypanthium top, orange. *Outer tepals* alternating with involucral bracts, c. 3 by c. 3.5 mm, broadly triangular, entire, apex acuminate to rounded, orange. *Inner tepals* at the same radii with involucral bracts, distally arching inward and apically broadly fused (inseparable

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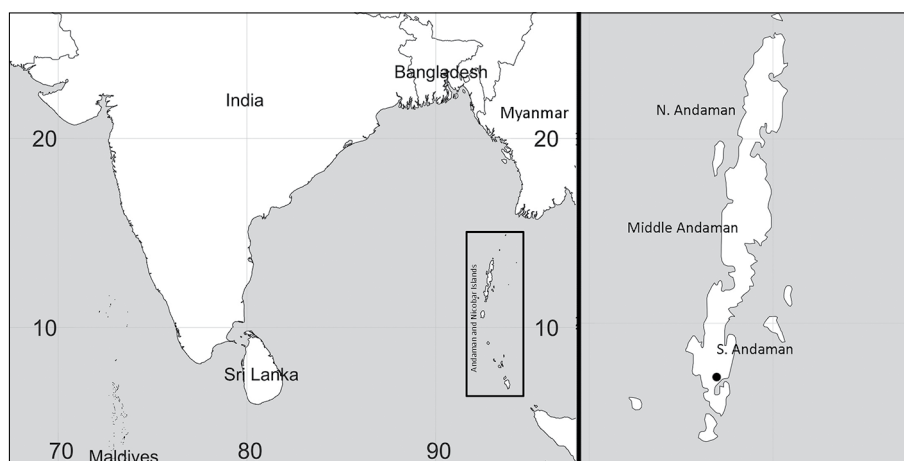
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Fig. 1 *Thismia aurantiaca* Hareesh & M.Sabu. a–b. Plant in habitat; c–e. habit (M. Sabu & V.S. Hareesh 152774). — Scale bar = 2 cm. — Photos by M. Sabu & V.S. Hareesh.



Fig. 2 *Thismia aurantiaca* Hareesh & M.Sabu floral parts. a. Habit showing split-opened flower with stamens; b–c. mitre; d. hypanthium side view; e. hypanthium front view; f–i. outer tepals; f–g. adaxial view; h–i. abaxial view; j–k. ovary with stigma (*M. Sabu & V.S. Hareesh 152774*). — Scale bars: a = 1 cm; b–c = 5 mm; d–e = 3 mm; f–k = 1 mm. — Photos by M. Sabu & V.S. Hareesh.



Map 1 Distribution map of *Thismia aurantiaca* Hareesh & M.Sabu.

without tearing) to form a thick convex-topped mitre c. 0.5 mm high. Lobes 15–17 by 14–16 mm, broadly spatulate, bases 3, orange, smooth, erect, thick, attached to annulus, basally 4.5–5 mm wide, broadened towards mitre. Inner surface of mitre slightly concave, glabrous. Stamens 6, 5.8–6.3 by 2 mm, quadrangular, attached on the top of the hypanthium, free from annulus; filaments fused with hypanthium and laterally fused with stamens, forming a staminal tube, suspended above the stigma; anthers c. 1 by 0.5 mm, mounted on fused connectives, thecae free, opening with longitudinal slits facing the inner wall of the perianth tube, covered with sparse glandular trichomes especially along the longitudinal slit, white. Ovary inferior, 2.5–3 by 3.5–4 mm, obconical, unilocular, outer wall longitudinally verrucose; style cylindrical, c. 0.5 by 1 mm; stigmas 3, 1.25 by c. 1.5 mm long, fused together and forming a dome-like structure, papillose, off white. Fruit 5–6.5 by 6–6.5, cup-shaped, verrucate, pale orange in colour. Seeds not seen.

Habitat & Ecology — So far, we could observe three populations with around 18 individuals each in the evergreen forest patches of Mount Harriet National Park, South Andaman. The plants are growing in a damp habitat in the understory of evergreen forest in association with *Amomum andamanicum* V.P.Thomas, Dan & M.Sabu (*Zingiberaceae*), *Dipterocarpus* sp. and *Hopea* sp. (*Dipterocarpaceae*), *Phrynium* sp. (*Marantaceae*), *Malaxis* sp. (*Orchidaceae*).

Conservation assessment — Due to the known limited area of occurrence of *T. aurantiaca*, the new species is to be classified as Critically Endangered based on IUCN Red-list criteria CR B2ab(i,ii,iii,iv,v) and C2a(i,ii)b (IUCN 2017).

Key to the species of *Thismia* in India

1. Tepals greenish yellow, densely silky puberulent outside, mitre with single opening and brownish hypanthium
 *T. sahyadrica*
1. Tepals orange, glabrous on both surfaces, mitre with three openings and white hypanthium with orange ribs
 *T. aurantiaca* sp. nov.

Acknowledgments We are grateful to the Department of Science and Technology (New Delhi) for the financial assistance for the research project (Sanction No. SERB/SB/SO/PS/92/2013, dtd.09.07.2014). VSH is grateful to the International Association for Plant Taxonomy for the 'IAPT Research Grant 2017'. Thanks are also due to Principal Chief Conservator of Forests (Wildlife), Department of Environment and Forest, Andaman and Nicobar Islands for granting permission and providing necessary assistance for the field studies in the forest: Mr. Dileep, Port Blair for various support rendered during our expedition to various places in the Andaman and Nicobar Islands; S. Chantanaorrapint, Prince of Songkla University, Thailand and M.S. Nuraliev,

Joint Russian-Vietnamese Tropical Scientific and Technological Center, Vietnam for critical comments on the identity of the new species.

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