

Thismia breviappendiculata (Thismiaceae), a New Mycoheterotrophic Plant from Southern Myanmar

Nobuyuki Tanaka^{1,*}, Mu Mu Aung² and Myo Myin Latt³

¹Department of Botany, National Museum of Nature and Science,
Amakubo 4–1–1, Tsukuba, Ibaraki 305–0005, Japan

²Forest Research Institute, Forest Department, Ministry of Natural Resources
and Environmental Conservation, Yezin, Nay Pyi Taw, Myanmar

³Department of Environmental Economic, Policy and Administration, University
of Forestry and Environmental Science, Yezin, Nay Pyi Taw, Myanmar

*E-mail: nobuyuki_tanaka@kahaku.go.jp

(Received 2 February 2018; accepted 28 March 2018)

Abstract *Thismia breviappendiculata* Nob. Tanaka (Thismiaceae) is described and illustrated. The new species was discovered in the bamboo forest on the limestone foothill, the Tanintharyi Nature Reserve, peninsular Myanmar. Description, photographic data including habitat, illustration and a key to the species of the genus presently recorded from Myanmar are provided. The new species is easily distinguished from the similar species, *T. javanica* J. J. Sm. and *T. tentaculata* K. Larsen & Aver. by very short appendage with claviform apex, white perianth lobes without any colored ridges.

Key words : Myanmar, mycoheterotrophic, new species, *Thismia*, Thismiaceae.

The genus *Thismia* Griff., the largest genus of the family Thismiaceae (formerly classified in Brumanniaceae), was established by Griffith (1844) based upon *T. brunonis* Griff. collected from Burma (presently Myanmar). Based on Merckx and Smets (2014) and Nuraliev *et al.* (2014), 54 species of *Thismia* were recognized. Recently several species were additionally described from S. E. Asia, and presently the genus comprises about 60 species of mycotrophic herbs (e.g. Hroneš, 2014; Hunt *et al.*, 2014; Merckx and Smets, 2014; Chantanaorrapint and Sridith, 2015; Hroneš *et al.*, 2015; Mar and Saunders, 2015; Nuraliev *et al.*, 2015; Cowie and Liddle, 2016; Sochor *et al.*, 2017; Chantanaorrapint and Suddee, 2018) and is distributed mainly in tropical Asia and America with a concentration of species in Southeast Asia (Jonker, 1938; Merckx *et al.*, 2013). The Thai-Malay Peninsula represents one of the species diversity centers of

Thismia (Hroneš *et al.*, 2015; Chantanaorrapint *et al.*, 2016). Currently, twelve species of *Thismia* are known from the Thai-Malay Peninsula (e.g., Jonker, 1948; Stone, 1980; Chantanaorrapint and Chantanaorrapint, 2009; Chantanaorrapint and Sridith, 2015; Chantanaorrapint *et al.*, 2015, 2016), however, northwestern part of the Peninsula, southernmost tip of Myanmar has not been well explored, and still much more contributions to the knowledge on its flora are needed. In Myanmar, thus far only one species, *Thismia brunonis* Griff. has been recorded from Tenasserim (Griffith, 1844).

During the field exploration to Dawei (formerly Tavoy), Tanintharyi (formerly Tenasserim), a peninsula region of Myanmar, in rainy season in 2015, we found an unidentified plant of the genus *Thismia*. The plant collected does not match any described species, and hence is described here as a new to science.

Thismia breviappendiculata Nob. Tanaka, sp. nov. (Fig. 1, 2)

Type: —MYANMAR. Tanintharyi Region. Thetkaekwat Compartment, Tanintharyi Nature Reserve, Yephyu Township, 230m alt., 14°20'56.85" N, 98°11'42.54" E, *Nobuyuki Tanaka, Mu Mu Aung, Myo Min Latt and Aung Kyaw Thu 173* (holotype-TNS, isotype-RAF).

Diagnosis: *Thismia breviappendiculata* is similar to *T. javanica* J.J.Sm. and *T. tentaculata* K. Larsen & Aver. in having the inner perianth lobes of isosceles triangle form tapering filiform appendage, but easily distinguished from the latter by very short appendage with claviform apex, white perianth lobes without any colored ridges.

Small terrestrial, achlorophyllous, mycoheterotrophic herbs, up to 3 cm tall. Root thick, vermiform, whitish, 7–8 mm long, ca. 0.5 mm in diameter. Stem whitish, translucent, erect, unbranched, to 3 cm tall, 0.5 mm in diameter at anthesis, glabrous, terete. Leaves 5–6, translucent-whitish, alternately scattered along stem, appressed, scale-like, with a single vascular trace entire, narrowly triangular, 4–5 mm long, 1–2 mm wide at the base, round at apex; leaves increase in size up to the apex of the plant where they are equivalent to floral bracts. Floral bracts 3, white, similar to upper leaves. Flower usually solitary, rarely paired with 5 mm pedicel. Perianth actinomorphic with 6 tepals fused to form a basal urceolate perianth tube, free apically. Perianth tube broadly conical to obovate, white, translucent, urceolate, 8–9 mm long, ca. 4 mm wide, narrowed just above the ovary, widest at the upper third, longitudinally finely grooved with 12 translucent longitudinal ridges without color, white transverse bars inside; crowned with a broad, prominent, fleshy, clearly hexagonal annulus. Perianth lobes yellow. Outer perianth lobes obtuse, ovate, 2 mm long, 2 mm wide; inner perianth lobes of isosceles triangle form tapering a yellow filiform appendage on the abaxial surface; the filiform appendage ca. 5 mm long, with

orange colored claviform apex. Stamens 6, yellowish, pendulous below mouth of annulus; filaments 6, flattened, borne on the thickened margin of the perianth tube, laterally connate, forming an anther tube, apically lobed; each stamen with 4 thecae, thecae ca. 0.8 mm long; nectariferous gland present towards apex in center of each connective, rounded. Ovary inferior, cup-shaped, ca. 4 mm long, papillose, with longitudinal ridges, unilocular, placentas 3; style ca. 1 mm long, grooved basally; stigma 3-lobed, ca. 0.7 mm long, surface densely papillose, translucent whitish. Fruit cup-shaped, brownish capsule. Mature seeds unknown.

Habitat: —*Thismia breviappendiculata* grows on wet leaf litter in the lowland bamboo forest or secondary seasonal lowland forest. The plant prefers humid places in shade. (Fig. 1-A).

Phenology: —Flowering July to August in rainy season.

Distribution: —Myanmar. Two populations were found in the reserved forests, Tanintharyi in Myanmar and the specimens were collected from the both of the places (*Tanaka et al. 156 and 173*). The species is likely to be common around the type locality, and further extension of surveys in this region may discover more populations. Its distribution range may share with peninsular Thailand.

Etymology: The specific epithet is derived from very short appendage of perianth lobes.

Other specimen examined: —MYANMAR. Tanintharyi Region. Michaung Hlaung (Old village), Tanintharyi Nature Reserve, Yephyu Township, 17 m elev., *Nobuyuki Tanaka, Mu Mu Aung, Myo Min Latt, and Aung Kyaw Thu 156* (TNS, RAF).

Note: Sect. *Thismia* is classified into two subsections, *Odoardoa* Schltr. with equal perianth lobes in length and size and *Brunonithismia* Jonker with larger inner perianth lobes than outer ones (Schlechter, 1921; Jonker, 1938). This new species may be assignable to sect. *Thismia* subsect. *Brunonithismia* Jonker.

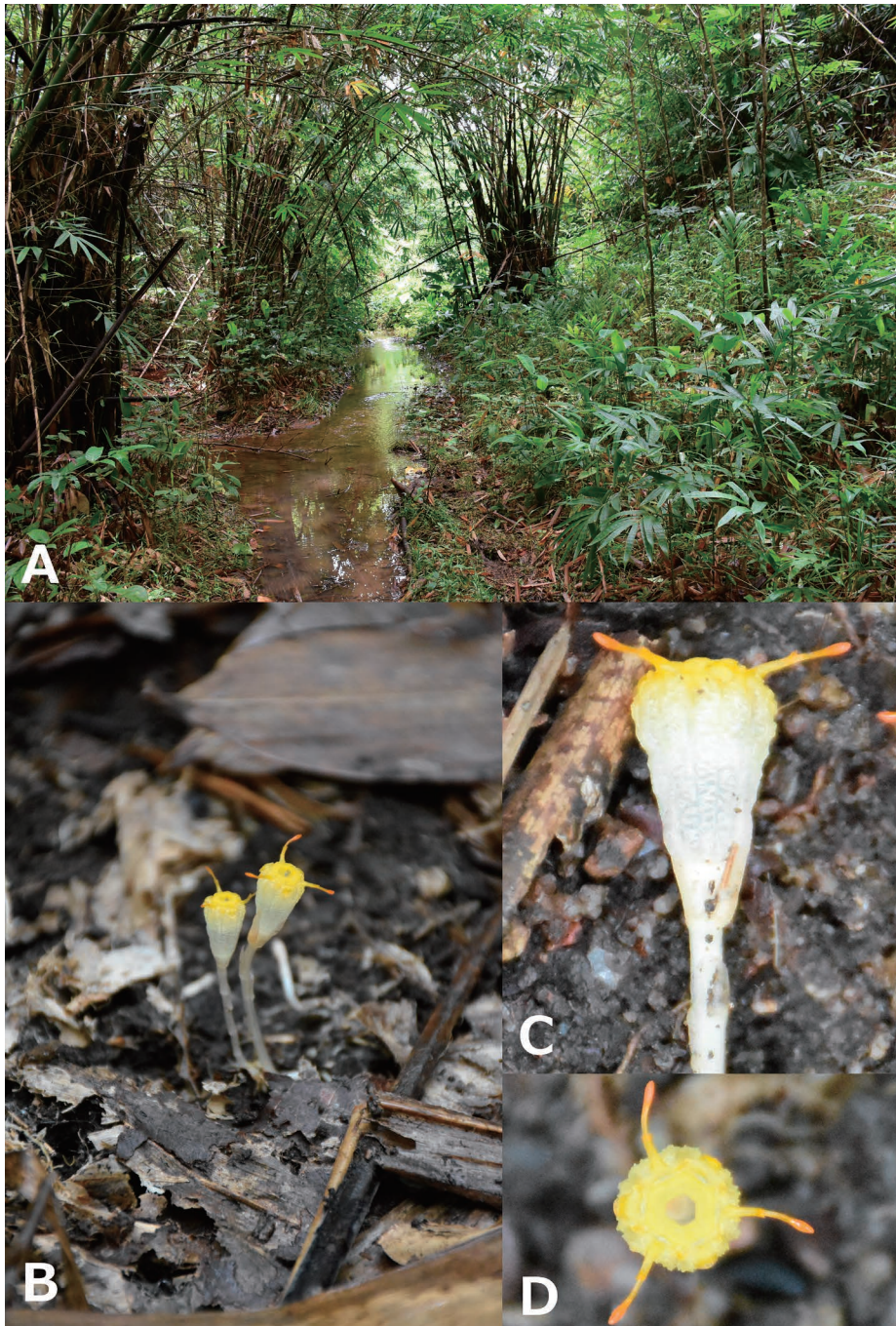


Fig. 1. A, habitat. B, two individuals growing in shade on wet leaf litter in the lowland bamboo forest in Tanintharyi Nature Reserve. C, side view of inflorescence. D, top view of inflorescence.

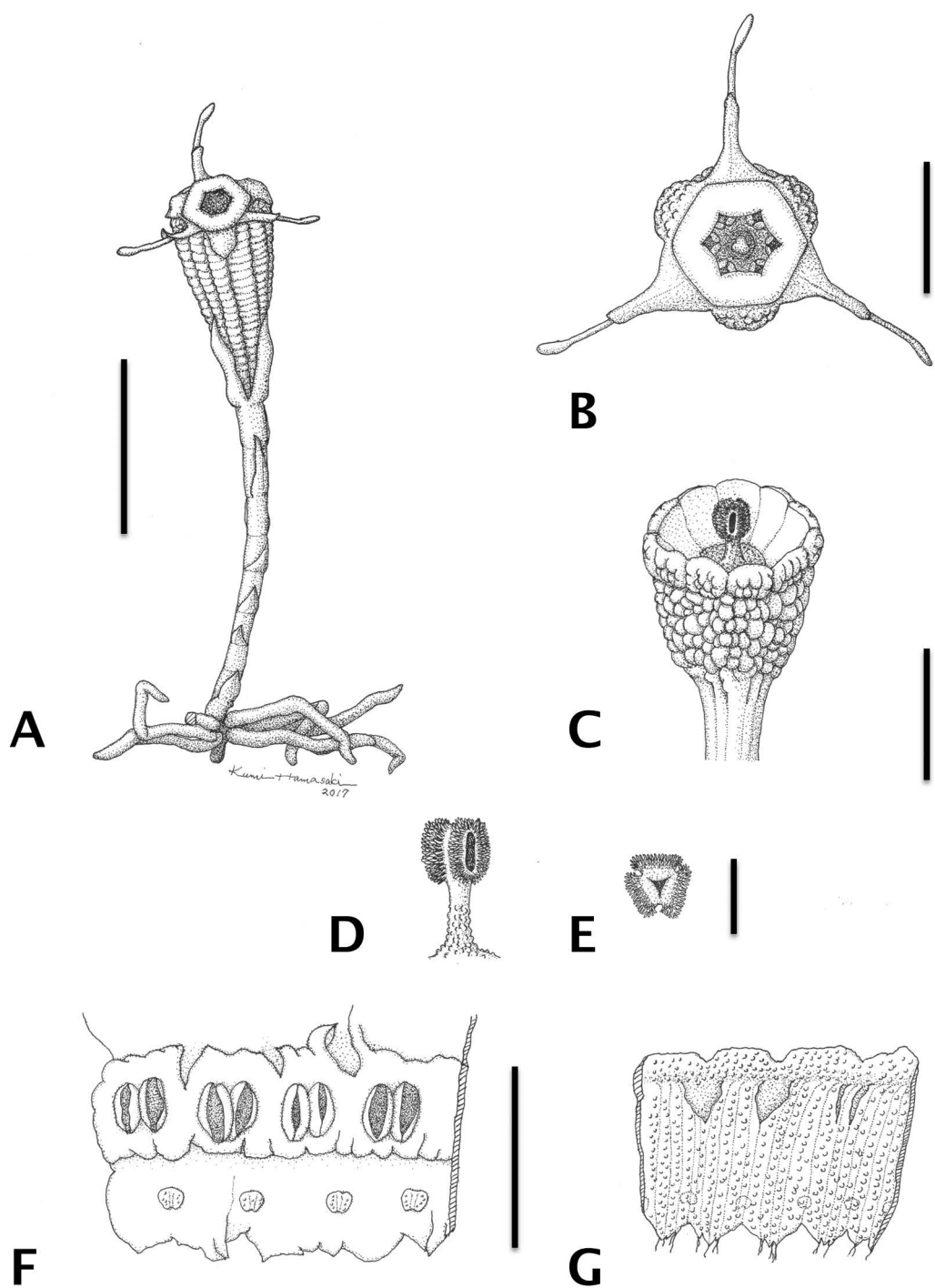


Fig. 2. *Thismia brevipendiculata*, sp. nov. A, habit of the plant. B, view of perianth tube mouth with annulus and perianth lobes with short claviform appendage from the top. C, immature fruit with stigma. D, side view of stigma. E, view of stigma from the top. F, adaxial view of pendulous stamens, showing four stamens and nectariferous glands. G, abaxial view of connective of stamens broad forming a skirt-like appendage with stri-gose apex. Scale bars: 1 cm for A, 5 mm for B, C, F and G, and 1 mm for D and E.

Key to the taxa presently recorded from Myanmar

1. Appendage of perianth lobes filiform with tapering apex, ca. 10 mm long, 4–6-flowered, stigma 6-lobed, apex acute..... *Thismia brunonis*
1. Appendage of perianth lobes filiform with claviform apex, ca. 5 mm long, 1–2-flowered, stigma 3-lobed, apex rounded..... *Thismia breviappendiculata*

Acknowledgements

This study was carried out by the international cooperative project “Biological Inventory with special attention to Myanmar” as the integrated research initiated by the National Museum of Nature and Science, Japan based on a memorandum of understanding (MoU) with the Forest Department, Ministry of Natural Resources and Environmental Conservation, Myanmar. The authors are grateful to Forest Department of Myanmar for permitting and supporting our botanical surveys in the protected areas. We also thank K. Hamasaki for preparation of the drawing.

References

- Chantanaorrapint, S. and Chantanaorrapint, A. 2009. *Thismia clavigera* (Thismiaceae), a new record for Thailand. Thai Forest Bulletin (Botany) 37: 27–31.
- Chantanaorrapint, S. and Sridith, K. 2015. *Thismia nigricans* Chantanaorr. & Sridith, a new species of Thismiaceae from southern Thailand. Phytotaxa 217: 293–297.
- Chantanaorrapint, S. and Suddee, S. 2018. *Thismia thaithongiana* (Dioscoreaceae: Thismieae), a new species of mycoheterotroph from an unusual habitat. Phytotaxa 333: 287–292.
- Chantanaorrapint, S., Tetsana, N. and Sridith, K. 2015. Notes on *Thismia clandestina* (Thismiaceae), a little known mycoheterotrophic species. Polish Botanical Journal 60: 71–74.
- Chantanaorrapint, S., Wai, J. S., Poopath, M. and Tetsana, N. 2016. *Thismia claviformis* (Thismiaceae), a new species from the Thai-Malay Peninsula. Phytotaxa 280: 292–296.
- Cowie, I. D. and Liddle, D. T. 2016. *Thismia tectipora* (Thismiaceae), a new, unusual mitre-form species from tropical Australia. Nuytsia 27: 85–94.
- Griffith, W. 1844. On the root parasites referred by authors to Rhizanthæe, and their allies. Proceedings of the Linnean Society of London 1: 221–223.
- Hroneš, M. 2014. *Thismia gigantea*, a new combination in *Thismia* (Thismiaceae). Phytotaxa 172: 55–56.
- Hroneš, M., Koblíková, L., Taraška, V., Popelka, O., Hédli, R., Sukri, R. S., F. Metali and M. Dančák. 2015. *Thismia brunneomitra*, another new species of *Thismia* (Thismiaceae) from Ulu Temburong, Brunei Darussalam. Phytotaxa 234: 172–178.
- Hunt, C. A., Steenbeeke, G. and Merckx, V. S. F. T. 2014. *Thismia megalongensis* (Thismiaceae), a new species of *Thismia* from New South Wales. Telopea 16: 165–174.
- Jonker, F. P. 1938. A monograph of the Burmanniaceae. Mededeelingen van het Botanisch Museum en Herbarium van de Rijks Universiteit Utrecht (Utrecht) 51: 1–279.
- Jonker, F. P. 1948. Burmanniaceae. In: van Steenis, C. G. G. J. (Ed.) Flora Malesiana I, 4, pp. 13–26. Noordhoff-Kolf, Leiden.
- Mar, S. S. and Saunders, R. M. K. 2015. *Thismia hongkongensis* (Thismiaceae): a new mycoheterotrophic species from Hong Kong, China, with observations on floral visitors and seed dispersal. PhytoKeys 46: 21–33.
- Merckx, V. S. F. T., Freudenstein, J. V., Kissling, J., Christenhusz, M. J. M., Stotler, R. E., Crandall-Stotler, B., Wickett, N., Rudall, P. J., Maasvan de Kamer, H. and Mass, P. J. M. 2013. Taxonomy and classification. In: Merckx, V. S. F. T. (ed.), Mycoheterotrophy: the Biology of Plants living on Fungi, pp. 19–101, Springer, New York.
- Merckx, V. S. F. T. and Smets, E. F. 2014. *Thismia americana*, the 101st anniversary of a botanical mystery. International Journal of Plant Sciences 175: 165–175.
- Nuraliev, M. S., Beer, A. S., Kuznetsov, A. N. and Kuznetsova, S. P. 2014. *Thismia mucronata* (Thismiaceae), a new species from southern Vietnam. Phytotaxa 167: 245–255.
- Nuraliev, M. S., Beer, A. S., Kuznetsov, A. N. and Kuznetsova, S. P. 2015. *Thismia puberula* (Thismiaceae), a new species from southern Vietnam. Phytotaxa 234: 133–142.
- Ridley, H. N. 1924. *Thismia*. Flora of the Malay Peninsula. 4: 307–308. L. Reeve and Co., London.
- Schlechter, R. 1921. Die Thismieae. Notizblatt des Königlischen Botanischen Gartens und Museums zu Berlin 8: 31–45.

- Sochor, M., Sukri, R. S., Metali, F. and Dančák, M. 2017. *Thismia inconspicua* (Thismiaceae), a new mycoheterotrophic species from Borneo. *Phytotaxa* 295: 263–270.
- Stone, B. C. 1980. Rediscovery of *Thismia clavigera* (Becc.) F. v. M. (Burmanniaceae). *Blumea* 26: 419–425.