



## *Thismia nigricans* Chantanaorr. & Sridith, a new species of *Thismiaceae* from Southern Thailand

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### Abstract

*Thismia nigricans* Chantanaorr. & Sridith is described and illustrated as a new species from Sri Phangnga National Park, southern Thailand. A taxonomic description, illustrations of the new species and a comparison with the related species *T. angustimitra* Chantanaorr. and *T. mirabilis* K. Larsen are presented.

**Key words:** achlorophyllous, mycoheterotrophic, Thailand, *Thismia nigricans*

### Introduction

The genus *Thismia* Griffith (1844: 221), the largest genus of the family *Thismiaceae*, and was established by Griffith in 1844 based on *T. brunonis* Griffith (1844: 221) from Myanmar. It comprises about 55 species of mycotrophic herbs (e.g. Hroneš 2014; Merckx & Smets 2014; Hunt *et al.* 2014; Mar & Saunders 2015) and is distributed mainly in tropical Asia and America with a concentration of species in Southeast Asia (Jonker 1938; Maas *et al.* 1986; Merckx *et al.* 2013). In the last decade, several new species of the genus have been described from South-East Asia (Tsukaya & Okada 2005, 2012; Larsen & Averyanov 2007; Chantanaorrapint 2008, 2012; Dančák *et al.* 2013; Nuraliev *et al.* 2014; Truong *et al.* 2014). This genus is well characterized by being small mycoheterotrophic herbs possessing tuberous or vermiform underground, or coralloid roots. Its stems are unbranched with few scale-like leaves. Flowers are solitary, or rarely 2–6 in a cincinnus, actinomorphic or zygomorphic, the tube cylindrical to urceolate; tepals 6, often unequal, in 2 distinct whorls, the inner whorl sometimes connate forming a mitre; stamens 6, inserted in the throat, pendent; connectives often with appendages, or hairs, free or connate into a tube with thecae separated; ovary 1-locular, with 2–3 parietal placentas or with free placental columns. The fruit is cup-shaped.

Most *Thismia* species are small with highly reduced vegetative morphology and are not easily discerned in the field. Although various regional treatments of *Thismia* have been published and six species have been reported from Thailand (Larsen 1965, 1987; Chantanaorrapint & Sridith 2007; Chantanaorrapint 2008, 2012; Chantanaorrapint & Chantanaorrapint 2009), more new records of species are expected in unexplored areas, especially in the lower peninsular part of the country. During recent visit of Sri Phangnga National Park in southern Thailand, an undescribed species of *Thismia* was collected, with a unique combination of characters that did not match any existing described species. It is therefore described here as a species new to science.

### Materials and methods

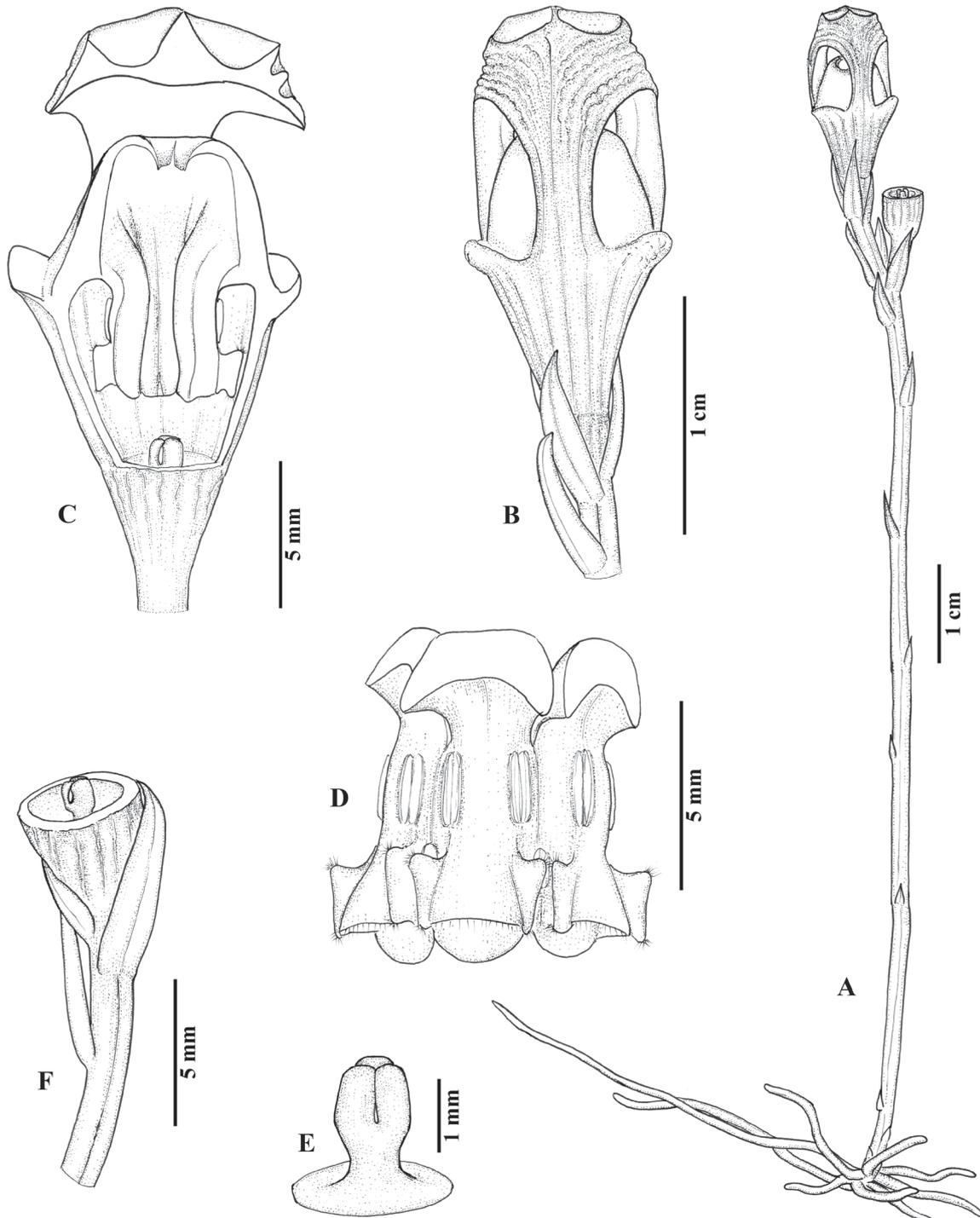
This study is based on recent collections from Thailand. Voucher specimens of the new species are deposited in BKF and PSU herbaria. Morphological characters were studied using stereo microscopes, and distinctive characters of the species were illustrated with the aid of an Olympus drawing tube.

## Taxonomic Treatment

*Thismia nigricans* Chantanaorr. & Sridith, sp.nov. (Figs. 1 & 2A–F)

*Thismia nigricans* is similar to *T. angustimitra* Chantanaorr., but differs in having glabrous filaments, the apex of annulus divided into 3 lobes without golden-brown hairs, and the mitre bearing more irregularly dentate ribs.

**Type:**—THAILAND. Phangnga: Kura Buri, Bang Wan, Sri Phangnga National Park, 08°59'34.06" N, 098°27'5.22" E, 56 m, 3 August 2014, S. Chantanaorrapint & C. Promma 3897 (holotype, PSU!, isotype, BKF!)



**FIGURE 1.** *Thismia nigricans* Chantanaorr. & Sridith A. Habit. B. Side view of flower. C. Longitudinal section of flower. D. Inner (adaxial) view of three pendulous stamens. E. Stigma. F. Fruit. All from the holotype (PSU, S. Chantanaorrapint & C. Promma 3897) by S. Chantanaorrapint.



**FIGURE 2.** A–F. *Thismia nigricans* Chantanaorr. & Sridith: A–B. Habit, C–D. Flowers, E. Longitudinal section of flower, F. Fruit. G–J. *T. angustimitra* Chantanaorr.: G. Habit, H–I. Longitudinal section of flowers, J. Top view of mitre. K–M. *T. mirabilis* K. Larsen: K. Habit, L. Longitudinal section of flower, M. Top view of mitre. All photos by S. Chantanaorr.rint.

Small terrestrial, achlorophyllous, mycotrophic herbs. Underground parts clustered, creeping, vermiform, branched, brownish-white tip, to 1.5 mm in diameter. Stem erect, simple, whitish, to 11 cm tall, 2.2–2.8 mm in diameter, glabrous, terete. Leaves glabrous, appressed, narrowly triangular with acute apex, scale-like, 2–8.5 mm long, 1.2–2.2 mm wide, leaves increase in size up to the apex of the plant where they are equivalent to floral bracts. Involucral bracts 3, white, similar to upper leaves. Flowers solitary or paired, developing sequentially with only one anthetic. Perianth actinomorphic with 6 tepals fused to form a perianth tube with a foveate mitre. Perianth tube bluish brown or blackish

at base, cup-shaped, 5.5–8 mm long, ca 4–8 mm wide, narrowed just above the ovary, widest at the upper third, with 12 irregularly dentate longitudinal ribs, inside with an irregularly reticulate surface without transverse bars. Outer tepals 3, white, ca. 1.7–2 mm long, 3.5–4 mm wide, apex oblique, spreading, rounded or mucronate, margin nearly entire, dorsal surface with 3 irregularly dentate longitudinal ribs. Inner tepals 3, bluish brown or blackish, mitriform with three lateral apertures, aperture 5.5–7 mm in diameter; mitre bearing prominent irregularly dentate ribs and three foveae on top; annulus incurved, ca 5 mm high, glabrous, creamy-white at base, blackish at apex, apex divided into 3 lobes. Stamens 6, creamy-white, pendent below mouth of annulus; filaments glabrous, free, ribbon-shaped, ca. 2 mm long; stamens laterally connate, forming an anther tube; individual stamens with 4 thecae (abaxial, dehiscing towards inner surface of perianth tube), each theca oblong, ca. 1.5 mm long; nectariferous gland present towards apex on the line of fusion between each connective, elliptic-oblong; connective of stamens broad forming a skirt-like appendage, apex of stamens obtuse to round without trichomes. Ovary inferior, obconical, ca. 3 mm long, with papillose longitudinal ridges, unilocular, placentas 3; style short, ca. 0.5 mm; stigmas 3-lobed, ca. 1 mm long, creamy-white, surface papillose, apex of stigma truncate. Fruit cup-shaped, ca. 5 mm long, fruit stalk thickened and lengthened after flowering.

**Distribution:**—Known only from the type locality in Sri Phangnga National Park, Phangnga Province, Thailand.

**Habitat and Ecology:**—The type specimens were found growing with other mycotrophic plants such as *Epirixanthes* sp. and *Thismia javanica* Smith (1907: 32), amongst leaf litter, under shade in evergreen forest, ca. 50 m above sea level.

**Phenology:**—Flowering and fruiting during the rainy season from August to November.

**Etymology:**—The specific epithet “*nigricans*” refers to the dark color of flowers.

**Additional specimen examined:**—THAILAND. Phangnga: Kura Buri, Bang Wan, Sri Phangnga National Park, about 200 m to Ton Deng Waterfall, 54 m, 14 November 2012, *V. Chamchumroon et al.* 5602A (BKF, paratype).

**Discussion:**—*Thismia nigricans* is most similar to *T. angustimitra* Chantanaorrapint (2008: 254) and *T. mirabilis* Larsen (1965: 171), both distributed in Thailand. The three species share several similarities in common, viz. reduced outer perianth lobes, the inner ones forming an erect mitre with three lateral holes, the top of the mitre having three foveae, the inner surface of perianth tube possessing an irregularly reticulate surface without transverse bars, and vermiform underground parts. *Thismia nigricans*, however, is distinguished from *T. angustimitra* by the absence of golden-brown hairs on the basal part of its stamens and the annulus mouth (Fig. 2E). It also differs from *T. angustimitra* by the mitre bearing more strongly dentate ribs. *Thismia mirabilis* is separated from *T. nigricans* by having a broad mitre with smooth surface and erect annulus (Figs. 2K–M).

Within the treatment of Jonker (1938), *Thismia angustimitra*, *T. mirabilis*, and *T. nigricans*, resemble the species in sect. *Sarcosiphon* (Blume 1850: 65) Jonker (1938: 251), as they have mitriform flower with three lateral apertures. However, the three species from Thailand differ from the species in sect. *Sarcosiphon* in having vermiform roots, whilst those in sect. *Sarcosiphon* have a coralloid root system. Determination of the interrelationships among *Thismia* species still requires addition of these three species in molecular phylogenetic analyses.

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