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Flora of Bokor National Park VII: *Thismia bokorensis* (Burmanniaceae), a new species representing a new generic record

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The genus *Thismia* Griffith (1844: 221) of the tribe Thismieae, Burmanniaceae *sensu* APG IV (2016) or Thismiaceae of other authors, represents one of the most species-rich mycoheterotrophic genera and consists of more than 60 species (Jonker 1948, Merckx 2008). Considering that the majority of these species were collected only once (Jonker 1948), and that many new species have recently been discovered, especially from various Southeast Asian countries (e.g., Tsukaya & Okada 2012, Dančák *et al.* 2013, Nuraliev *et al.* 2014, 2015, Truong *et al.* 2014, Chantanaorrapint & Sridith 2015, Li & Bi 2013, Hroneš *et al.* 2015, Tsukaya *et al.* 2017, Suetsugu *et al.* 2017), many more undescribed species are probably still hidden in the tropical rain forests of Southeast Asia.

Here, we describe a new species, *Thismia bokorensis* Suetsugu & Tsukaya, discovered during a botanical survey in Bokor National Park, Cambodia, in 2013. This is the first record of the genus *Thismia* for Cambodia. The newly discovered specimen apparently belongs to the section *Thismia* (formerly *Euthismia* Schltr.) subsect. *Brunonithismia* Jonker (1938: 242), in having free and spreading inner perianths, larger inner perianth lobes, and vermiform, creeping roots. After a careful examination, the unknown plant was found to have a significantly different floral morphology from all the other known species.

Thismia bokorensis Suetsugu & Tsukaya, *sp. nov*. (Figs. 1, 2)

Type:—CAMBODIA. Kampot Province: Bokor National Park, evergreen forest near a stream, 10°36’33.6” N, 104°04’12.6” E, elev. 370 m, 10 Aug. 2013, *Tagane, Fuse, Yokota, Zhang & Chhang 5857* (holotype: TNS, in the spirit collection).

Thismia bokorensis is similar to *Thismia tentaculata* Larsen & Averyanov (2007: 16) of Vietnam and Hong Kong in having the lateral appendage of the connective that does not exceed the apical part of the connective, three-toothed apical margin of the connective, and the shorter light yellow tentacles in inner perianth lobes.

Achlorophyllous mycoheterotrophic herbs. Roots light brown, creeping, vermiform, branched, clustered at base of stem. Stem white, simple, glabrous, erect or ascending, 4–6 cm long with a few distant bract-like leaves and 2 terminal flowers. Leaves and floral bracts white, narrowly triangular, 2.0–7.0 × 0.5–2.0 mm, apex acute, appressed to the stem. Ovary and pedicel white, 6–7 mm long. Flower perianth of 6 tepals fused to form a basal perianth tube, apically free; perianth tube actinomorphic, 8–9 mm long, 5 mm in diam. near the apex, pure white, longitudinally finely grooved with 12 low, rough ribs, inside with finely irregular manicate-rugulose surface without transverse bars, at the apex with broad, light yellow annulus. Free parts of outer perianth lobes light yellow, broadly triangular, 1.2 × 2.4 mm, apex broadly obtuse or rounded. Free parts of inner perianth lobes light yellow, narrowly triangular, 2.6 × 2.1 mm tapering at apex into long, filiform, tentacle-like projection, 8 mm long, with an articulation near the base. Stamens 6, pendent from the inner margin of perianth annulus, connectives flattened, ribbon-shaped, connate to form a tube; individual connective bearing 2 whitish thecae; each gland is seen on the fused line between neighboring connectives; teeth on free apical part 3, narrowly triangular, tapering at apex into long, filiform, tentacle-like projection, ca. 1 mm long, with articulation near the base; lateral appendage of connective flattened, wing-like, not exceeding apical part of the connective, margin slightly dentate, with glandular hairs. Style 0.5 mm long, with 3 shallowly bilobed stigmas, stigma 1.0 mm long. Capsule cup-shaped, white to pale brown, topped by a basal ring of perianth tube and withered style and stigmas. Seeds not seen.

Distribution:—Cambodia (so far known only from type locality).

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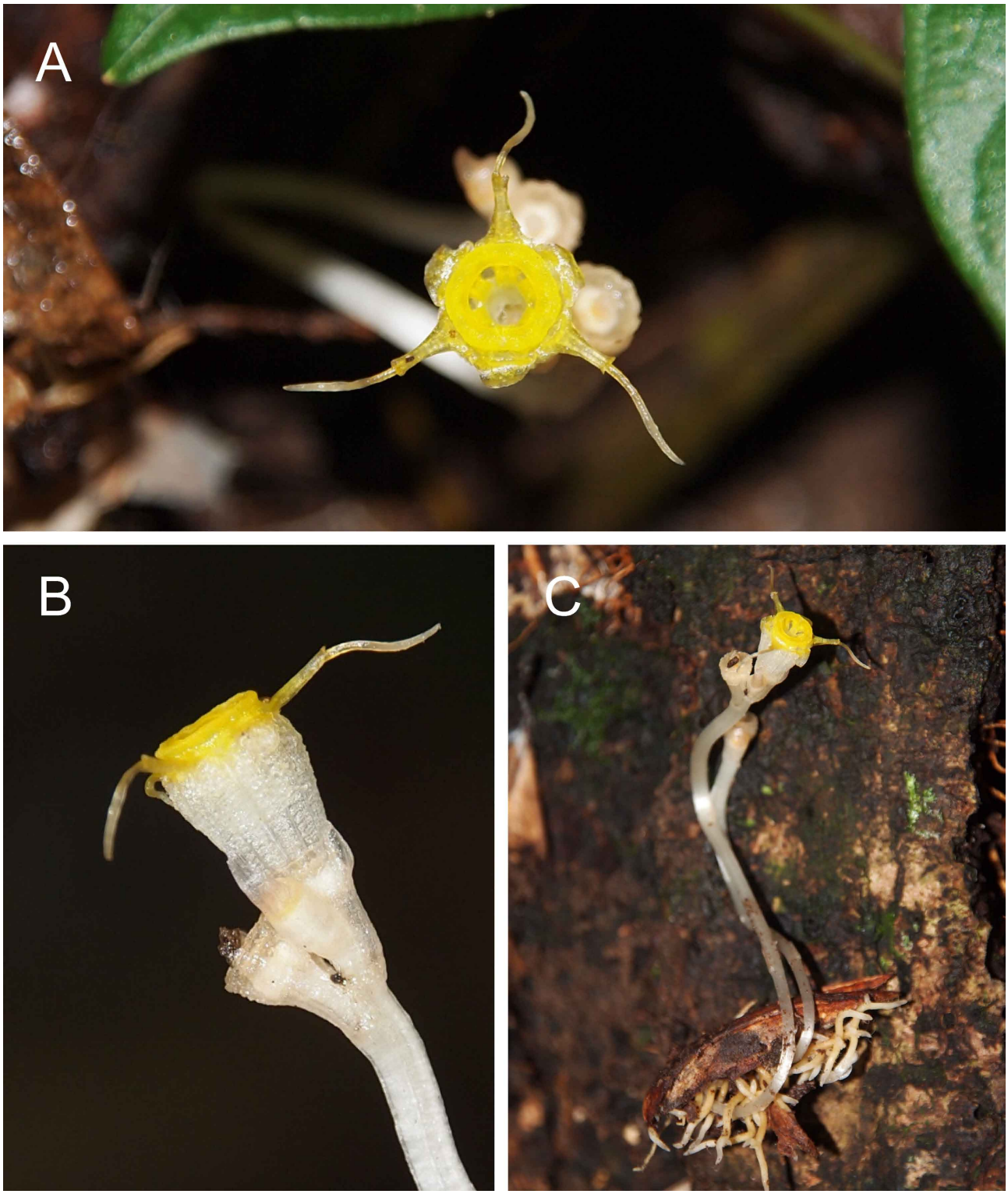

FIGURE 1. *Thismia bokorensis* from the type locality. A–B. Flowers. C. Flowering plant.

Habitat and ecology:—Only one individual was found in the evergreen forest, near a stream, at an elevation of 370 m. The forest was dominated by *Scaphium affine* (Malvaceae), *Diospyros schmidtii* (Ebenaceae), *Ardisia sanguinolenta* (Primulaceae), *Epiprinus siletianus* (Euphorbiaceae), *Mallotus subpeltatus* (Euphorbiaceae), *Knema lenta* (Myristaceae), *Syzygium siamense* (Myrtaceae), and *Prismatomeris tetrandra* (Rubiaceae). The roots of the specimen above were tangled to an old seed of *Ixonanthus reticulata* (Ixonanthaceae). The flowering specimen was collected in August.

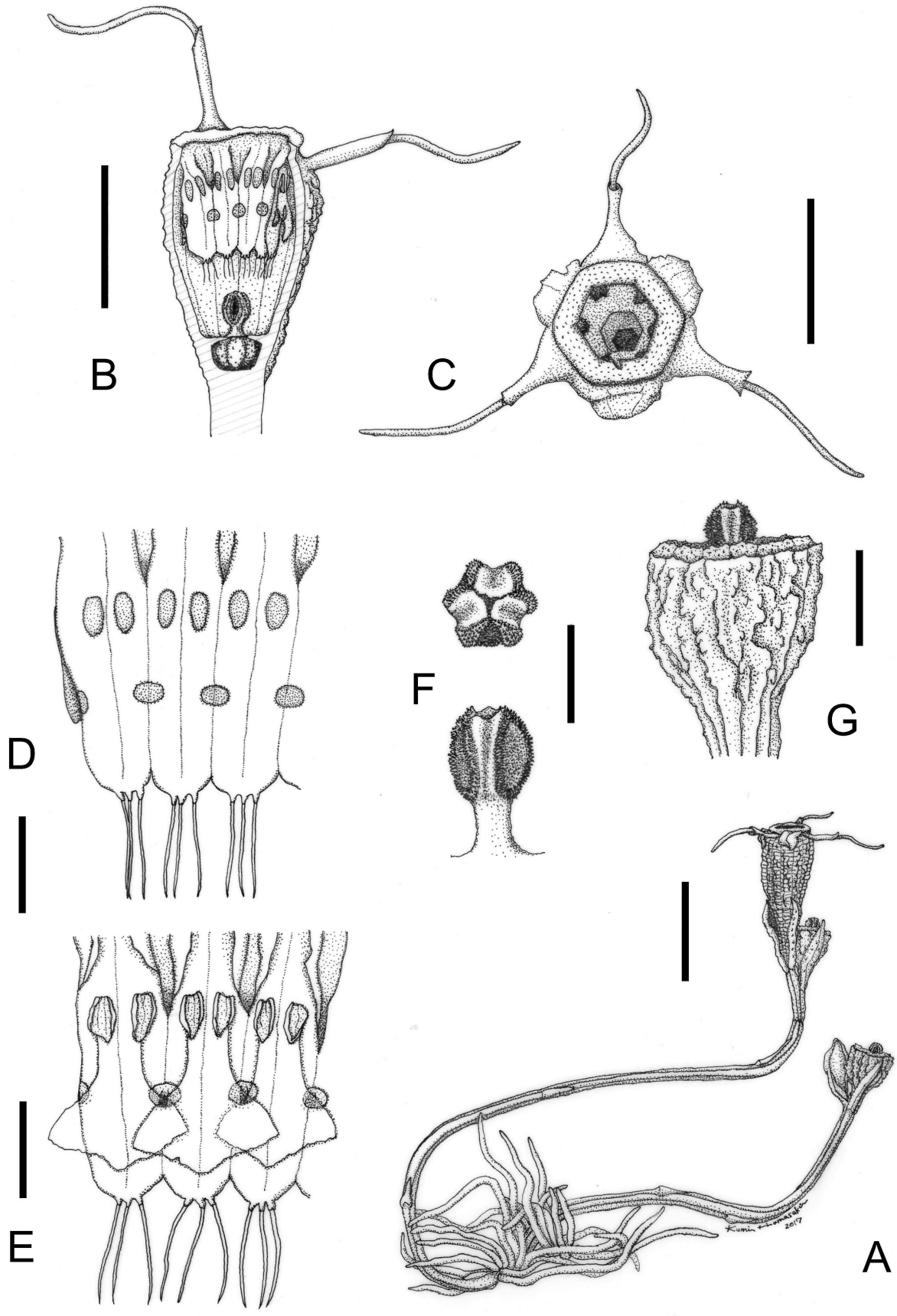

FIGURE 2. *Thismia bokorensis.* A. Flowering plant. B. Longitudinal section of flower. C. Flower, upper view. D. Stamen with apical lobes, inner view. E. Stamen with lateral appendage, glands and thecae, outer view. F. Style and stigma, upper view (above) and lateral view (below). G. Immature fruit. Materials from *Tagane et al. 5857* (TNS). Drawn by Kumi Hamasaki. Bars = 10 mm (A), 5 mm (B–C), 1 mm (D–F) and 2 mm (G).

Preliminary IUCN conservation status:—Critically Endangered on the basis of one location, a single mature individual, a single population and a continuing decline in the habitat quality. [CR: B1ab(iii)+B2ab(iii); C2a(i, ii); D]. Only a single individual was collected on the southern slope of Mt. Bokor. Given the lowland forest below 400 m elevation on Mt. Bokor had been cleared or selectively logged, it is likely that some habitats of this species have been lost. We need conservation of the lowland forest in Mt. Bokor and further efforts to discover additional individuals.

Taxonomic notes:—Within the treatment of Jonker (1948), *Thismia bokorensis* appears to belong to the section *Thismia* subsect. *Brunonithismia* Jonker, in having free and spreading inner perianth, larger inner perianth lobes, and vermiform, creeping roots. In subsect. *Brunonithismia*, *T. bokorensis* is most similar to *T. tentaculata* of Vietnam and Hong Kong in having a pure white perianth tube and finely irregular manicate-rugulose inner surface of the perianth tube but differs in having the lateral appendage of the connective not exceeding the apical part of the connective (vs. exceeding whole apical part of the connective), three narrowly triangular teethed apical margin of the connective (vs. two) and shorter yellow tentacles on the inner perianth lobes (ca. 8.0 mm long vs. 14.0–17.0 mm long and red). In addition, *T. bokorensis* is also similar to *T. gardneriana* Hook.f. ex Thwaites (1864: 325) but distinguished by the lateral appendage of the connective not exceeding the apical part of the connective (vs. almost the same with whole apical part of the connective), the fan-shaped lateral appendage of connective (vs. quadrangular shaped lateral appendage and shallowly bilobed stigmas (vs. deeply bilobed stigmas; Thwaites 1864, Jonker 1938). This new species is also similar to *T. javanica* Smith (1910: 32) and *T. arachnites* Ridley (1924: 308) in appearance but distinguished by a pure white perianth tube and finely irregular manicate-rugulose inner surface of the perianth tube without transverse bars (Larsen & Averyanov 2007, Ho *et al.* 2009).

Key of *Thismia bokorensis* and closely related species.

1. Inner surface of perianth tube finely irregular manicate-rugulose without transverse bars 2
1. Inner surface of perianth tube with transverse bars 4
2. Teeth on free apical part 3, narrowly triangular, tapering at apex into long, filiform, hair 3
2. Teeth on free apical part 2, narrowly triangular without long hair ..... *T. tentaculata*
3. Lateral appendage of the connective fan-shaped, not exceed apical part of the connective ..... *T. bokorensis*
3. Lateral appendage of the connective quadrangular-shaped, almost the same with whole apical part of the connective ..... *T. gardneriana*
4. Teeth on free apical part 3, narrowly triangular, tapering at apex into long, filiform, hair. Outer perianth lobes broadly ovate, obtuse, erect ..... *T. javanica*
4. Teeth on free apical parts, numerous, slightly dentate. Outer perianth lobes short, ear-shaped ..... *T. arachnites*

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