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Studies of the Homalomeneae (Araceae) of Peninsular Malaysia VIII: *Homalomena joanneae* [Chamaecladon Clade], a new locally endemic limestone-obligated species

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Abstract. *Homalomena joanneae* is described and illustrated as a new species of the Chamaecladon Clade restricted to the industrially threatened limestone of Gunung Kanthan, Kuala Kangsar, Perak, and compared with its probable nearest congener, *H. hendersonii* from Kelantan.

Keywords: *Homalomena* Chamaecladon Clade, taxonomy, Perak, Gunung Kanthan, Silurian-Devonian limestone.

INTRODUCTION

Homalomena remains the least well studied large genus of Asian Araceae, and of which the species of the Chamaecladon clade (*sensu* Wong et al. 2013) are perhaps the least well understood. This is partly because species of the Chamaecladon clade tend to be outwardly rather similar in appearance, especially as preserved specimens, and partly because along with producing some of the smallest blooms in the family, much of the key diagnostic data present in the usually tiny spadix is lost in herbarium specimens; thus, historical Types are for the most part uninformative.

The earliest accounts of *Homalomena* for Peninsular Malaysia are those of Hooker (1893), and Ridley (1907, 1925). These are now taxonomically unreliable as well as decidedly incomplete. Furtado (1939) attempted to untangle the taxonomy of *Homalomena* in the Indo-Malaysian region but, as has been noted in previous papers (e.g., Ng et al., 2011), succeeded only in further confusing an already difficult situation, especially so for the Chamaecladon clade. Following Furtado, no critical work was attempted until the early 2000s when a series of papers began to lay a tentative ground-

work for tackling the taxonomy of Peninsular *Homalomena*: Baharuddin and Boyce 2005, 2010, 2011, Boyce and Wong 2017; Zulhazman et al. 2011, 2012. Ng et al. (2011) suggested an informal framework of higher classification and Mashhor et al. (2011) proposed a decidedly tentative checklist building upon that of Hay et al. (1995).

The current situation in Peninsular Malaysia is that for the most part species of the Chamaecladon clade are difficult to name to species with any degree of confidence, largely owing to the reasons noted above. Nevertheless, there are very clearly new species that warrant description ahead of a full revision. The latter, while obviously desirable, is for the present impracticable since time is not available to revisit all of the Type localities in order to establish the circumscription of the pre-existing species.

Here we describe one such species from the Silurian-Devonian limestone of Gunung Kanthan that initially was thought to be *Homalomena hendersonii* Furtado from the limestone of Kuala Betis, Kelantan, some 80km to the east, but which on flowering proved to neither match *H. hendersonii* nor to be applicable to any pre-existing species.

Geological formations in this paper are verified with Tate et al. (2008).

Homalomena joanneae S.Y. Wong & P.C. Boyce, **sp. nov.** (Figures 1 & 2A)

Type: Cultivated at Forest Research Institute Malaysia, 5 Oct. 2020, *Ong Poh Teck FRI 96468* (original collection Malaysia, Perak, Kuala Kangsar District, Chemor, Gunung Kanthan, Area D, 04°45'73"N, 101°07'25"E, 217m asl, *Joanne Tan Pei Chih s.n.*) (holotype KEP!; isotype KEP – spirit SC11647). (Figures 1 and 2A).

Diagnosis

Homalomena joanneae is overall most similar to *H. hendersonii*, but readily differentiated by the rather few, large, pale green pistilate florets with an obliquely inserted style/sigma (vs pistillate florets numerous, white with a symmetrically inserted style/stigma), a stigma scarcely wider than the style (vs stigma noticeably wider than the style), and an ascending (vs orthotropic) style, and subglobose pale creamy staminodes (vs staminodes teardrop-shaped, white). *Homalomena joanneae* also differs from *H. hendersonii* by pale cream somewhat lax staminate florets equalling the height of the pistillate florets (vs smaller, more numerous congested white stamens that are shorter than the pistillate florets).

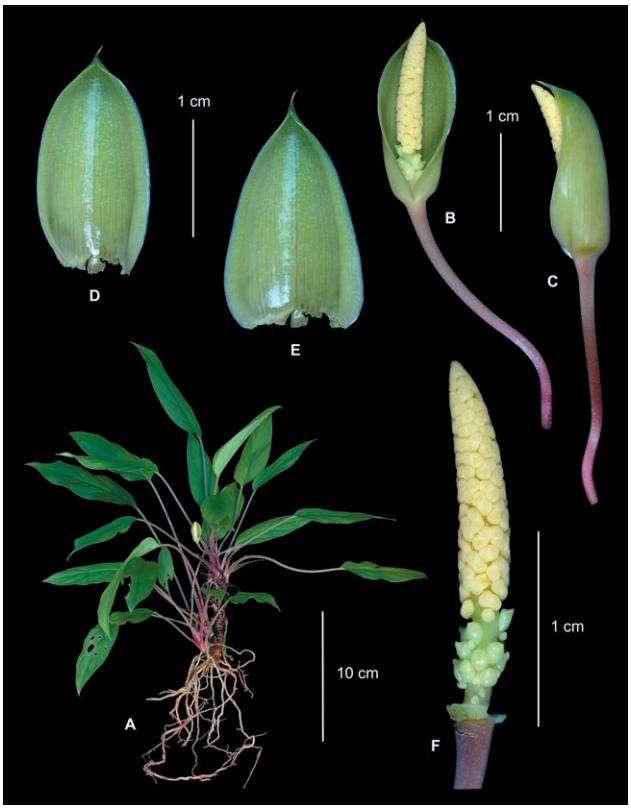

Figure 1. *Homalomena joanneae* (A) Cultivated flowering habit. (B) Bloom at pistillate anthesis. (C) Bloom at pistillate anthesis. (D) Spathe, artificially removed, natural form. (E) Spathe limb, slightly spread out. (F) Spadix at pistillate anthesis, spathe artificially removed. All from *Ong Poh Teck FRI 96468*.

Description

Small aromatic (terpenoids) herbs to c. 20 cm tall, although usually rather less. Stem epigeal, erect, older portions medium brown, partially clothed by the netted-fibrous remnants of old petiole bases, rooting from the nodes and from though the petiole bases; roots c. 1–2 mm diameter, tough, flexuous, whitish to pale brown, somewhat velvety. Leaves numerous, petioles erect, the older ones slightly spreading with the blades held more or less parallel to the ground; petiole 4–13 cm long, c. 2 mm diameter midway, dorsally narrowly channelled, pale green heavily suffused with pale maroon, especially in the lower half, microscopically velutinous; petiolar sheath 1.5–3 cm long, extending c. one-fifth length of the petiole, clasping at the base, width between both margins c. 1 mm, wings persistent; leaf blade lanceolate to elliptic oblong to ovate, 6–9.5 cm long, 3–4 cm wide, thinly coriaceous, microscopically scintillating-velutinous dark green adaxially, paler green abaxially, base cuneate, apex acute with a brief (c. 1.5 mm long)

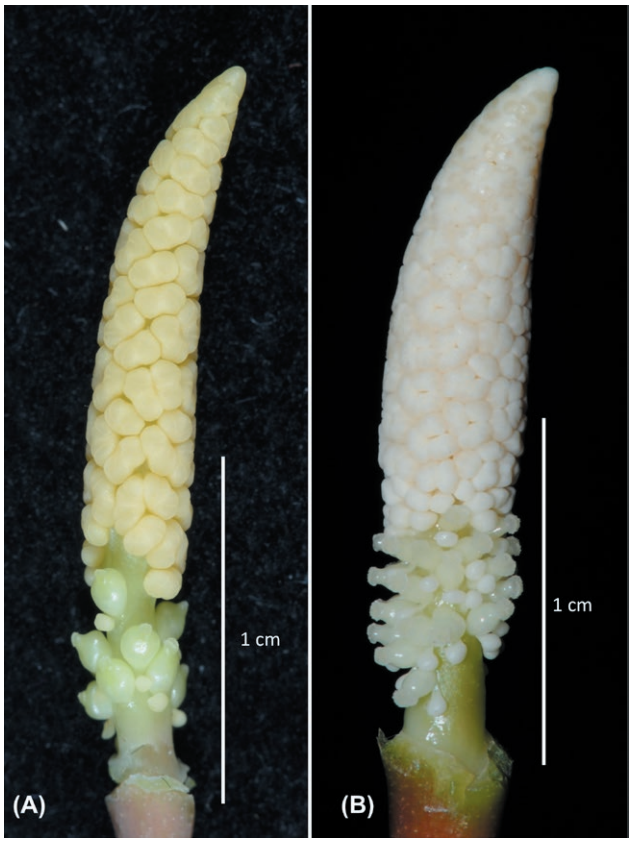

Figure 2. Spadix comparisons (A) *Homalomena joanneae* and (B) *Homalomena hendersonii.*

Figure 3. *Homalomena hendersonii. M.R.Henderson SFN29663* [SING] – HOLOTYPE. Image © Singapore Herbarium, used with permission.

tubule, margins smooth or slightly sinuous; midrib adaxially rather impressed, abaxially slightly prominent; primary lateral veins c. 4 on each side of midrib, adaxially impressed, abaxially slightly prominent, alternating with very much fainter regularly interspersed broken interprimaries, diverging at c. 35–60° from the midrib; secondary venation obscure, pellucid-striate; tertiary venation forming a faint darker tessellate reticulum most clearly visible adaxially; all veins running into a slightly thickened intramarginal vein. Blooms paired (always?), produced sequentially in a simple synflorescence; peduncle terete, slender, 2–3 cm long, c. 3 m diameter, green flushed pale maroon; spathe narrowly ellipsoid, not constricted, opening wide at anthesis, c. 2 cm long, 8 mm wide, with a terminal short mucro to c. 2 mm long, spathe gaping wide at anthesis with the margins spreading but seemingly not recurving, and opening far enough to expose the pistillate florets, then closing post staminate anthesis and persisting until basal dehiscence at fruit dispersal, exterior medium matte green with very faint longitudinal veins and minute scattered white speckles, interior similarly coloured but glossy, the margins hyaline. Spadix equalling spathe limb at opening and then extending to very slightly exceed spathe, c. 2 cm long, c. 3.5 mm diameter at mid-point, short stipitate, stipe c. 2 mm long, smooth, pale green; pistillate floret zone c. 5 mm long; pistils lax, broadly compressed ovoid, c. 1 mm tall × 0.8–0.9 mm diameter, pale greenish, style obliquely inserted on the upper surface (relative to the spadix axis), stigma capitate, hardly wider than the style, 0.3–0.4 mm diameter; each pistil with a single staminode situated on ventral side of the floret relative to the base of the spadix; interpistillar staminodes subglobose, c. 0.2 mm long pale creamy; staminate flower zone c. 1.3 cm long, tapering cylindrical, apex acute; staminate florets well-defined, somewhat lax, each consisting of two stamens, stamens rounded, c. 0.5 mm tall, 1–1.5 mm long × 0.5–0.8 mm wide, creamy white with the thecae tips very slightly transparent. Infructescence, fruit and seed not observed.

Eponymy

Named for Joanne Tan Pei Chih, formerly a research officer at the Forest Biodiversity Division, Forest Research Institute Malaysia (FRIM) from 2008 to 2020. Her expertise includes plant taxonomy in which she was actively involved with the flora survey in Gunung Kanthan, Perak. Joanne is also a horticulturist, previously maintaining a collection of rare and endangered plants at FRIM, in particular soft herbs such as *Begonia* that are difficult to maintain in cultivation.

Distribution and ecology

So far known only from the Gunung Kanthan where it occurs lithophytically on shaded Silurian-Devonian limestone at low altitudes.

Notes

Homalomena joanneae is associated with the Silurian-Devonian karst of the Kinta Valley (Ros and Ibrahim 2003), while *H. hendersonii* (Fig. 2B, 3) occurs under 80km distant at Kuala Betis, Kelantan, on the edge of the Gua Musang Formation of the Permo-Triassic Gua Musang Group (Kamal et al. 2016). Such distributions are typically representative of the incidences of highly localized floral endemism that is such a striking feature of the flora of Peninsular Malaysia.

Murray Ross Henderson (1899–1982) was among the first to draw particular attention to the limestone flora of Peninsular Malaysia (Henderson 1939). Later, a series of papers by Chin (1977, 1979, 1982) resulting from his Masters research under Ben Stone (1933–1994) presented the first comprehensive checklist for the Peninsular limestone flora, including the Araceae (Chin 1982: 176–183), and Kiew (2014) produced a checklist for the Batu Caves in Selangor, from where recently a taxonomically novel endemic *Schismatoglottis* was described (Wong and Boyce 2020).

For Gunug Kanthan, Tan et al. (2014) published three endemics [*Gymnostachyum kanthanense* Kiew (Acanthaceae), *Meiogyne kanthanensis* Ummul-Nazrah & J.P.C. Tan (Annonaceae) and *Vatica kanthanensis* Saw (Dipterocarpaceae)]. The highly precarious future of many of the most important limestone karst towers including for Gunung Kanthan was summarized most recently in Kiew et al. (2013). The mining operations for cement at Gunung Kanthan have already impacted very considerably on the hill (Figures 4 & 5).

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Figure 4. Drone photograph of Gunung Kanthan showing the still pristine southern flanks.

Figure 5. Drone photograph of Gunung Kanthan showing mining operation on the northern half.

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