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Source: Willdenowia, 42(2) : 241-246

Published By: Botanic Garden and Botanical Museum Berlin (BGBM)

URL: <https://doi.org/10.3372/wi.42.42208>

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Studies on *Homalomenaeae* (Araceae) of Borneo XII – *Homalomena tirtae*, a new species from Kalimantan Timur, Indonesian Borneo, and notes on the *Homalomena Borneensis* Complex

Abstract

Asih N. P. S., Kurniawan A. & Boyce P. C.: Studies on *Homalomenaeae* (Araceae) of Borneo XII – *Homalomena tirtae*, a new species from Kalimantan Timur, Indonesian Borneo, and notes on the *Homalomena Borneensis* Complex. – Willdenowia 42: 241–246. December 2012. – Online ISSN 1868-6397; © 2012 BGBM Berlin-Dahlem. Stable URL: <http://dx.doi.org/10.3372/wi.42.42208>

Homalomena tirtae from Mount Sidi, Kalimantan Timur, is described as a species new to science and illustrated from living plants. It is the fourth described species of the *Borneensis* Complex and the first recorded for eastern Borneo. A key to and a comparison plate with the spadices of the four species of the *Borneensis* Complex is provided.

Additional key words: aroids, *Homalomena borneensis*, taxonomy, Mount Sidi, East Kalimantan

Introduction

Previous papers in this and the related series for Peninsular Malaysia have highlighted the remarkable species diversity of the genus *Homalomena* in the Asian humid tropics, pointing out the overwhelming majority of species has yet to be formally named (Baharuddin & Boyce 2010a, b, 2011; Boyce & Wong 2008, 2009; Boyce & al. 2010a; Hoe & al. 2011a, b; Kurniawan & al. 2011; Ng & al. 2011a, b; Tung & al. 2010; Wong & Boyce 2011; Wong & al. 2011; Zulhazman & al. 2011). It has also been emphasised that such knowledge as exists is based principally on some well-known, but limited areas of the region, notably northern Malaysian Borneo, while at the same time the aroid flora of Sumatera, NE Peninsular Malaysia and critically the greater Indonesian portion of Borneo (Kalimantan) are essentially unknown (Boyce & al. 2010b; Mashhor & al. 2011).

This scarcity of knowledge for such extensive land areas, combined with the often highly localised distribution of many aroids including most *Homalomena* species, im-

plies that fieldwork in areas not previously investigated virtually always results in the discovery of new species. One such species is described here.

Results and Discussion

Homalomena tirtae Asih, A. Kurniawan & P. C. Boyce, **sp. nov.**

Holotype: Indonesia, Kalimantan Timur, Kabupaten Malinau, Kecamatan Malinau Selatan (Loreh), Mt Sidi, 25.11.2005, *I Gede Tirta* GT.2105 transferred and cultivated in the Bali Botanic Garden (Kebun Raya Eka Karya Bali), Indonesian Institute of Sciences (LIPI), accession E20051213, preserved 21.6.2012 (THBB; isotype: THBB [alcohol preserved]).

Homalomena tirtae differs from all other species of the *Borneensis* Complex by the combination of a green spathe limb and pistils much exceeding the interpistillar staminodes.

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Evergreen herb to c. 30 cm tall, vegetative tissues not perceptibly aromatic. *Stem* pleionanthic, partially subterranean, the vegetative portion erect, c. 2.2 cm thick, pale green; internodes to c. 5 mm long. *Leaves* up to 8 together, rather erect; each shoot module subtended by a single prophyll, c. 8 cm long, green, margin membranous and paler, not persistent; *petiole* 18–21 cm long \times c. 5 mm in diameter, adaxially shallowly grooved, the groove extending to the insertion of the blade, rounded abaxially, weakly D-shaped in cross section, semiglossy green with $\frac{1}{3}$ – $\frac{1}{2}$ of its length deep reddish brown to the insertion of the blade; *petiolar sheath* open, 7–10 cm long, $\frac{1}{3}$ – $\frac{1}{2}$ length of petiole, the wings long-persistent, rather membranous, pale green, lower part of sheath somewhat flushed to reddish-brownish abaxially; *leaf blade* broadly cordate to almost deltoid, somewhat wavy towards margin proximally, 15–17 cm long \times 12–14 cm wide, weakly coriaceous, matte medium green adaxially, glaucous pale green abaxially, apex acuminate and then mucronate for c. 4 mm, base weakly cordate; *midrib* prominently rounded-raised abaxially, adaxially somewhat impressed, up to 4 mm wide; *primary lateral veins* 6–7 on each side, diverging at 20° (distal one) to 90° (proximal ones) from the midrib, abaxially raised and darker than the blade, adaxially impressed; *interprimary veins* c. $\frac{1}{2}$ width of the primary lateral veins, regularly interspersed, flush with the lamina adaxially, abaxially almost raised or faint; *secondary venation* somewhat conspicuous to weakly flush with the lamina on both sides; *tertiary venation* invisible; all veins running into a weakly defined thickened intermarginal vein; *intermarginal vein* somewhat inconspicuous abaxially, adaxially almost invisible. *Inflorescences* up to 4 together, each subtended by a small narrowly triangular prophyll, suberect at anthesis, later declinate; *peduncle* to c. 9 cm long \times c. 4 mm in diameter, medium green, somewhat brownish stained. *Spathe* stiff, fleshy, tightly furled prior to anthesis, c. 6.2 cm long \times c. 1.5 cm wide at anthesis, semiglossy medium green, pale green at the distinct constriction and at the base externally, somewhat shiny greenish to creamy white internally; *lower spathe* ovoid to broadly ovoid, equal to longer than the limb; *limb* subcylindric to narrowly ovoid with a terminal mucro 4–5 mm long; lower spathe inflating and spathe limb gaping at pistillate anthesis, spathe limb opening wide at staminate anthesis and spadix extending and slightly protruding; spathe later closing to enclose spadix. *Spadix* c. 4.5 cm long \times c. 5 mm in diameter, stipitate, stipe c. 3–5 mm, pale green; *pistillate flower zone* cylindric, nearly $\frac{1}{2}$ the length of the spadix, c. 2 cm long; pistils densely arranged, globose, c. 1.5 mm tall \times c. 1 mm in diameter, greenish white, *stigma* convex-topped, much wider than the pistil, c. 1 mm tall \times 1.5–2 mm in diameter, mostly 3-lobed, semitranslucent, glossy greenish; most pistils associated to a single interpistillar staminode (rarely two interpistillar staminodes), occasionally (basal-most flowers) with 2–3 staminodes; interpistil-

lar staminodes globose, on a very slender stalk with an expanded top, c. 0.5 mm long, ivory; *sterile interstice* 1–2 mm long, partly naked above for <1 mm, with c. 12 suprapistillar staminodes in a row below, rhombohexagonal in plain view, whitish; *staminate flower zone* narrowly conic, about half the length of the spadix, $\frac{1}{4}$ – $\frac{1}{3}$ held within lower spathe chamber, c. 2.7 cm long, apex obtuse, ivory; staminate flowers densely arranged, trapezoid to hexagonal in plan view, each flower consisting of 4 stamens, lowermost 1–2 rows of flowers sterile and uppermost also sterile. *Infructescence* with spathe remaining green. *Fruits* not observed.

Ecology — *Homalomena tirtae* grows in humid lowland forests, where it was found at an elevation of c. 350 m in shaded areas of riversides, on stony volcanic clay.

Distribution — The species is known only from the type locality in Kalimantan Timur.

Eponymy — It is named for I Gede Tirta, an orchid specialist at Bali Botanic Garden, Indonesian Institute of Sciences (LIPI), who has incidentally collected many new species of aroids during his fieldwork in Kalimantan.

The *Homalomena* Borneensis Complex

Homalomena tirtae is the fourth species to be described of the Borneensis Complex (Ng & al. 2011a), to which it belongs by the open petiolar sheaths with margins eventually marcescent, leathery leaf blade with little or no posterior lobe development, a broadly truncate base, and rather few primary lateral veins, with the blade adaxially matte medium green and abaxially weakly glaucous, and the possession of a lower spathe longer than the spathe limb. *H. tirtae* differs from all other species by the combination of a green spathe limb and pistils much exceeding the interpistillar staminodes. It is the first species of the complex described for eastern Borneo.

A taxonomic summary of the previously described species of the Borneensis Complex is as follows:

Homalomena borneensis Ridl. in J. Straits Branch Roy. Asiat. Soc. 44: 173. 1905. – Holotype: Malaysian Borneo, Sarawak, Kuching, July 1893, *H. N. Ridley s.n.* (SING).

Homalomena clandestina P. C. Boyce & al. in Gard. Bull. Singapore 61: 277. 2010. – Holotype: Malaysian Borneo, Sarawak, Sri Aman, Lubok Antu, Batang Ai, Nanga Sumpa, Sungai Pedali, 25 April 2005, *P. C. Boyce & al.* AR-2385 (SAR)

Homalomena ovata Engl. in Bull. Reale Soc. Tosc. Ortic. 4: 296. 1879 [non (Schott) Hook. f., Fl. Brit. India 6: 536. 1893, nom. illeg. = *Homalomena griffithii* (Schott) Hook. f., Fl. Brit. India 6: 534. 1893] \equiv *Homalomena hostifolia* Engl., Pflanzenr. 55: 70. 1912, nom. superfl. – Holotype: Malaysian Borneo, Sarawak, Kuching, Matang, June 1866, *O. Beccari P. B.* 1780 (FI-B).



Fig. 1. *Homalomena tirtae* – A–C: habit of the plant in cultivation in the Bali Botanic Garden, source of the holotype; note the green spathe, open petiolar sheath and the brownish staining of the petiole; D: detail of pistillate flower zone at pistillate anthesis, showing the pistils exceeding the interpetistillar staminodes and the 3-lobed stigmas; E: inflorescence at late staminate anthesis; note that the terminal portion of the spadix is composed of sterile staminate flowers (no pollen strings released). – Photographs by Ni Putu Sri Asih from *I Gede Tirta GT.2105* cultivated as accession E20051213 in the Bali Botanic Garden.

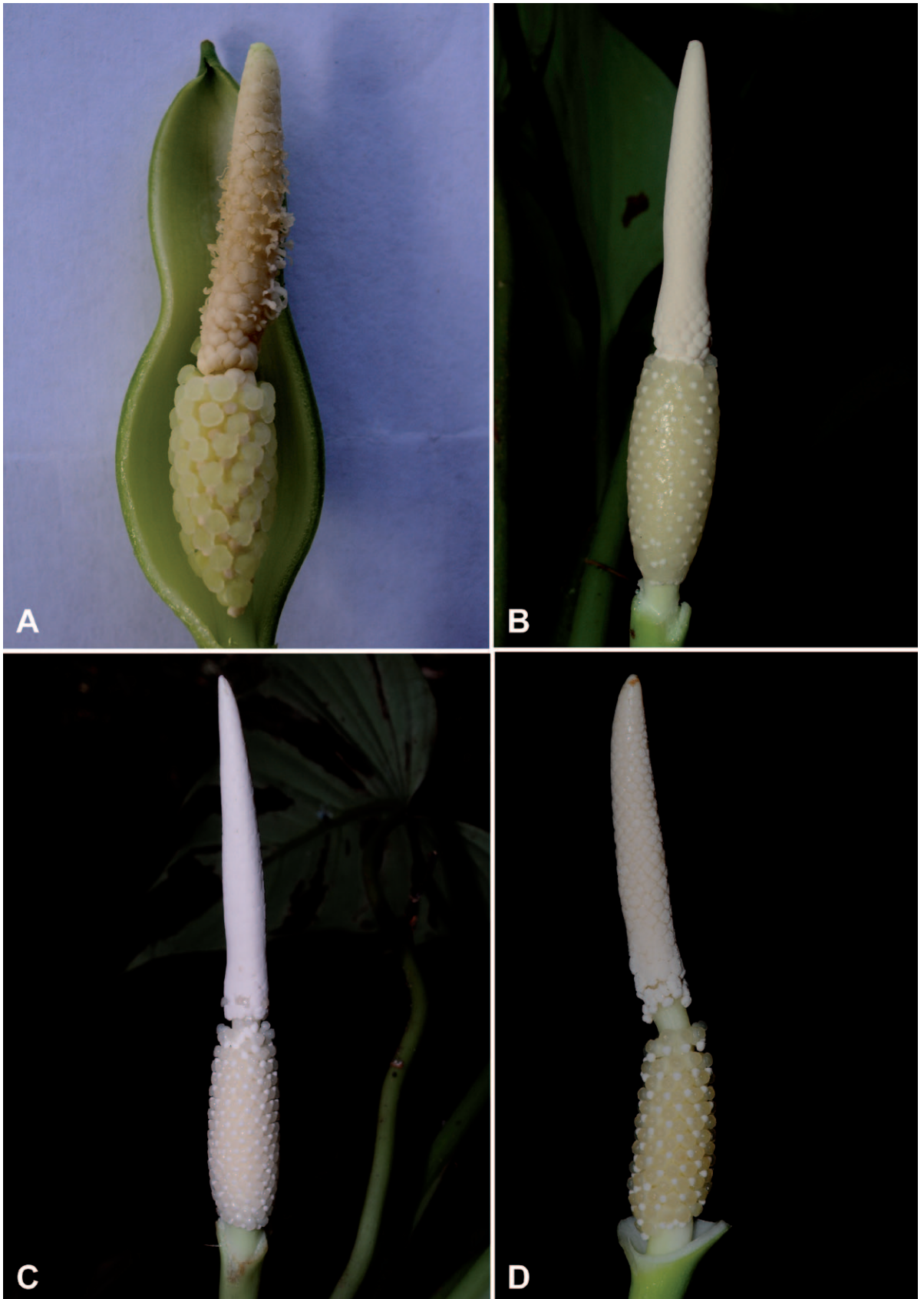


Fig. 2. Comparison of the spadices (spathe artificially removed) at staminate anthesis (A) and pistillate anthesis (B–D) of the four species of the *Homalomena* Borneensis Complex – A: *H. tirtae*, from I Gede Tirta GT.2105; B: *H. ovata*, from P. C. Boyce & al. AR-2361; C: *H. clandestina*, from P. C. Boyce & al. AR-2385; D: *H. borneensis*, from P. C. Boyce & al. AR-2559. – Photographs A by Ni Putu Sri Asih, B–D by P. C. Boyce.

Key to the species of the *Homalomena* Borneensis Complex

1. Pistillate flower zone accounting for nearly $\frac{1}{2}$ of the entire spadix; staminate and pistillate flower zones contiguous, not separated by a naked interstice . . . 2
- Pistillate flower zone accounting for $\frac{1}{3}$ or less of the entire spadix; staminate and pistillate flower zones separated by a naked interstice 3
2. Spathe green at anthesis; stigma rather clearly 3-lobed, wider than pistil; interpistillar staminodes shorter than pistils. Kalimantan Timur . . . *H. tirtae*
- Spathe white at anthesis; stigma not clearly 3-lobed, narrower than pistil; interpistillar staminodes equaling or slightly longer than pistils. W Sarawak *H. ovata*
- Staminate and pistillate flower zones separated by a zone with staminodes scattered along a short naked interstice 3
3. Pistils and stigmas yellowish, directed outwards; interpistillar staminodes with the clavate top papillate; pistillate flower zone weakly fusiform; spadix somewhat sinuous; leaf blade glaucous abaxially *H. borneensis*
- Pistils white with grey stigmas, directed upwards; interpistillar staminodes with the clavate top smooth; pistillate flower zone markedly fusiform; spadix straight; leaf blade not glaucous abaxially *H. clandestina*

Acknowledgements

The authors thank the following people: I Gede Tirta who collected the living plants from Kalimantan Timur, Dr Bayu Adjie and I Putu Agus Hendra W. for their support to this study, I Nyoman Sudiatna and I Made Suja for their excellent maintenance of the living collection and assistance in preparing the type material. This study was fully supported by DIPA Tematik for *Araceae* to the first author.

References

- Baharuddin S. & Boyce P. C. 2010a: Studies on *Homalomenaeae* (*Araceae*) of Peninsular Malaysia I: *Homalomena asmae*, a new species from Perak. – Acta Phytotax. Geobot. **60**: 163–166.
- Baharuddin S. & Boyce P. C. 2010b: Studies on *Homalomenaeae* (*Araceae*) of Borneo V: A new species and new supergroup record of *Homalomena* from Sabah, Malaysian Borneo. – Trop. Life Sci. Research **21**: 89–94.
- Baharuddin S. & Boyce P. C. 2011: Studies on *Homalomenaeae* (*Araceae*) of Peninsular Malaysia V: *Homalomena wallichii*, refound after more than 190 years. – Aroideana **34**: 24–29.
- Boyce P. C. & Wong S. Y. 2008: Studies on *Homalomenaeae* (*Araceae*) of Borneo I: Four new species and speculation on informal species groups in Sarawak. – Gard. Bull. Singapore **60**: 1–29.
- Boyce P. C. & Wong S. Y. 2009: Studies on *Homalomenaeae* (*Araceae*) of Borneo IV: *Homalomena* specimens in the Herbarium Beccarianum Malesia (FI-B) of the Museo di Storia Naturale, Sezione Botanica “F. Parlatore” dell’Università di Firenze. – Webbia **64**: 169–173.
- Boyce P. C., Wong S. Y. & Fasihuddin B. A. 2010[a]: Studies on *Homalomenaeae* (*Araceae*) of Borneo II: The *Homalomena* of Nanga Sumpa (Batang Ai) – Novel & pre-existing taxa, and notes on Iban Usages. – Gard. Bull. Singapore **61**: 269–317.
- Boyce P. C., Wong S. Y., Low S. L., Ting A. P. J., Low S. E., Ooi I. H. & Ng K. K. 2010[b]: The *Araceae* of Borneo. The genera. – Aroideana **33**: 3–74.
- Hoe Y. C., Wong S. Y., Boyce P. C., Wong, M. H. & Chan M. K. Y. 2011a: Studies on *Homalomenaeae* (*Araceae*) of Borneo VII: *Homalomena debilicrista* a new species from Sarawak, Malaysian Borneo, with observations on its pollination. – Pl. Div. Evol. **129**: 77–87.
- Hoe Y. C., Wong S. Y., Boyce, P. C., Wong, M. H. & Chan M. K. Y. 2011b: Studies on *Homalomenaeae* (*Araceae*) of Borneo XI: *Homalomena matangae*, a new species from Sarawak, Malaysian Borneo. – Webbia **66**: 143–148.
- Kurniawan A., Ni Putu Sri Asih, Adjie B. & Boyce P. C. 2011: Studies on *Homalomenaeae* (*Araceae*) of Borneo IX: A new species of *Homalomena* Supergroup Chamaecladon from Kalimantan Timur, Indonesian Borneo. – Aroideana **34**: 30–36.
- Mashhor M., Boyce P. C., Ahmad Sofiman O. & Bahrudin S. 2011: The *Araceae* of Peninsular Malaysia. – Pulau Pinang: Penerbit Universiti Sains Malaysia.
- Ng K. K., Boyce P. C. & Ahmad Sofiman O. 2011[a]: Studies on *Homalomenaeae* (*Araceae*) of Peninsular Malaysia II: An historical and taxonomic review of the genus *Homalomena* (excluding *Chamaecladon*). – Gard. Bull. Singapore **62**: 277–289.
- Ng K. K., Ahmad Sofiman O., Boyce, P. C. & Wong S. Y. 2011[b]: Studies on *Homalomenaeae* (*Araceae*) of Borneo VIII: Delimitation of additional informal suprageneric taxa for Sundaic *Homalomena*. – Webbia **66**: 21–28.
- Tung L. S., Wong S. Y. & Boyce P. C. 2010: Studies on *Homalomenaeae* (*Araceae*) of Borneo VI: *Homalomena giamensis*, a new species from Sarawak, Malaysian Borneo, with notes on its pollination. – Aroideana **33**: 201–211.
- Wong S. Y. & Boyce P. C. 2011: Studies on *Homalomenaeae* (*Araceae*) of Borneo X: Two new *Homalomena* species from Brunei, and a new informal species complex for Supergroup Cyrtocladon. – Webbia **66**: 133–141.

- Wong S. Y., Boyce P. C. & Fasihuddin B. A. 2011: Studies on *Homalomenae* (*Araceae*) of Borneo III: The helophytic *Homalomena* of Sunda. – Gard. Bull. Singapore **62**: 313–325.
- Zulhazman H., Boyce P. C. & Mashhor M. 2011: Studies on *Homalomenae* (*Araceae*) of Peninsular Malaysia III: *Homalomena kualakohensis*, a new species from Kelantan. – Acta Phytotax. Geobot. **61**: 35–39.