

## Studies on Schismatoglottideae (Araceae) of Borneo XXV: a diminutive new *Piptospatha* from Sabah

Peter C. Boyce<sup>a\*</sup> and Wong Sin Yeng<sup>b</sup>

<sup>a</sup>School of Biological Sciences, Universiti Sains Malaysia, Pulau Pinang Malaysia; <sup>b</sup>Department of Plant Science & Environmental Ecology, Faculty of Resource Science & Technology, Universiti Malaysia Sarawak, Sarawak, Malaysia

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A diminutive new species of *Piptospatha*, *P. loi* P.C. Boyce and S.Y. Wong, is described from waterfalls over basalt in E Sabah. Overall, it is most similar to *P. pileata* S.Y. Wong and P.C. Boyce (Kalimantan Timur, obligated to shales), but differs in several features of the inflorescences and leaves. The new species is illustrated from living plants.

**Keywords:** Araceae; Borneo; *Piptospatha*; Malaysia; Sabah; Schismatoglottideae

### Introduction

The most recent review of *Piptospatha* (Boyce & Wong 2012) recognized ten species. Since then, three additional new species from Kalimantan Timur have been identified (Boyce and Wong in press; Wong and Boyce 2012). While Wong and Boyce (2012) was still in press, a photograph sent from East Sabah alerted us to the possibility of a further undescribed species, or at least an extension to the known range of *P. pileata* S.Y. Wong and P.C. Boyce, but we were unable to proceed further as detailed images of the inflorescence were lacking. The spathe and spadix have now been studied, revealing that the Sabah plant, known from two localities, both on basalts, represents yet another taxonomic novelty of the genus *Piptospatha*. It is here described.

*Piptospatha loi* P.C. Boyce & S.Y. Wong, **sp. nov.**

#### Diagnosis

Flowering *Piptospatha loi* most closely resembles *P. pileata* S.Y. Wong and P.C. Boyce by the deep magenta-purple strongly rostrate spathe limb. However, *P. loi* is readily differentiated by the spathe basally with a prominent ventral mentum, by the larger, centrally impressed interstice staminodes held in a zone wider than the remainder of the spadix, the stamens irregularly arranged (not carried in two rows), and the proportionately longer staminate flower zone. The leaves of *P. loi* are only c. half as long as those of *P. pileata*, and much narrower; the entire plant is seldom exceeding 15 cm.

Type: Malaysian Borneo, Sabah, Bahagian Tawau, Lahad Datu, Ulu Segama-Malua F.R., Air Terjun Bilong, 05 07 13.6 N, 117 43 35.4 E, 26 June 2012, *Mike L AR-3992* (holo SAN [spirit]). Figure 1.

Solitary or slightly clumping rheophytic herb to 15 cm tall. **Roots** strong and adhering to bare, wet

rocks, c. 1 mm in diameter. **Stem** very short, to 10 mm in diameter, obscured by leaf bases. **Leaves** many together, arching, forming a dense rosette; petiole bases clasping stem; petiole 1–2 cm long, up to 2 mm in diameter, D-shaped in cross-section with the dorsal margins crispulate-hyaline and reddish, petiole minutely but distinctly scabrous, pale to rather deep olive green; petiolar sheath with free ligular portion 1–2.5 cm long, marcescent and ultimately deciduous, very deep brown; leaf blades narrowly lanceolate, 4–9 cm long × 1–1.5 cm wide, base cuneate, apex acute with stout tubule c. 5 mm long, blade medium semi glossy green adaxially, paler abaxially; mid-rib very slightly bluntly raised adaxially, rounded-raised and minutely scabrous abaxially; primary lateral veins c. 6 per side, parallel pinnate, impressed adaxially, slightly raised abaxially and tending to be red-flushed, at least on newer leaves; interprimary lateral veins much weaker than primary laterals, although still conspicuous, visible as semi-translucent lines running parallel to the primary laterals and joining a quite well defined submarginal collecting vein. **Inflorescence** solitary, erect; peduncle 8–11 cm long (at anthesis; fruiting peduncle not observed), c. 2 mm in diameter, minutely scabrous, medium olive green. **Spathe** initially erect, later held at ca 90° to peduncle, not constricted, dark greenish pink in bud, opening with exposed spathe limb bright magenta-purple shading to deep purple pink distally, matte olive green basally and along the outer part of the convolution (held ventrally), basal part minutely scabrous; spathe limb inflated-pileate at anthesis, shedding during staminate anthesis, c. 3.4 cm long, the base ca 1 cm wide with a conspicuous ventral mentum c. 3 mm long, limb mid-way inflated to c. 1.7 cm, then ventrally constricted and terminating in a tubule c. 4 mm long. **Spadix** 15–17 mm long × c. 5 mm in diameter, base

\*Corresponding author. Email: [phymatarum@gmail.com](mailto:phymatarum@gmail.com)

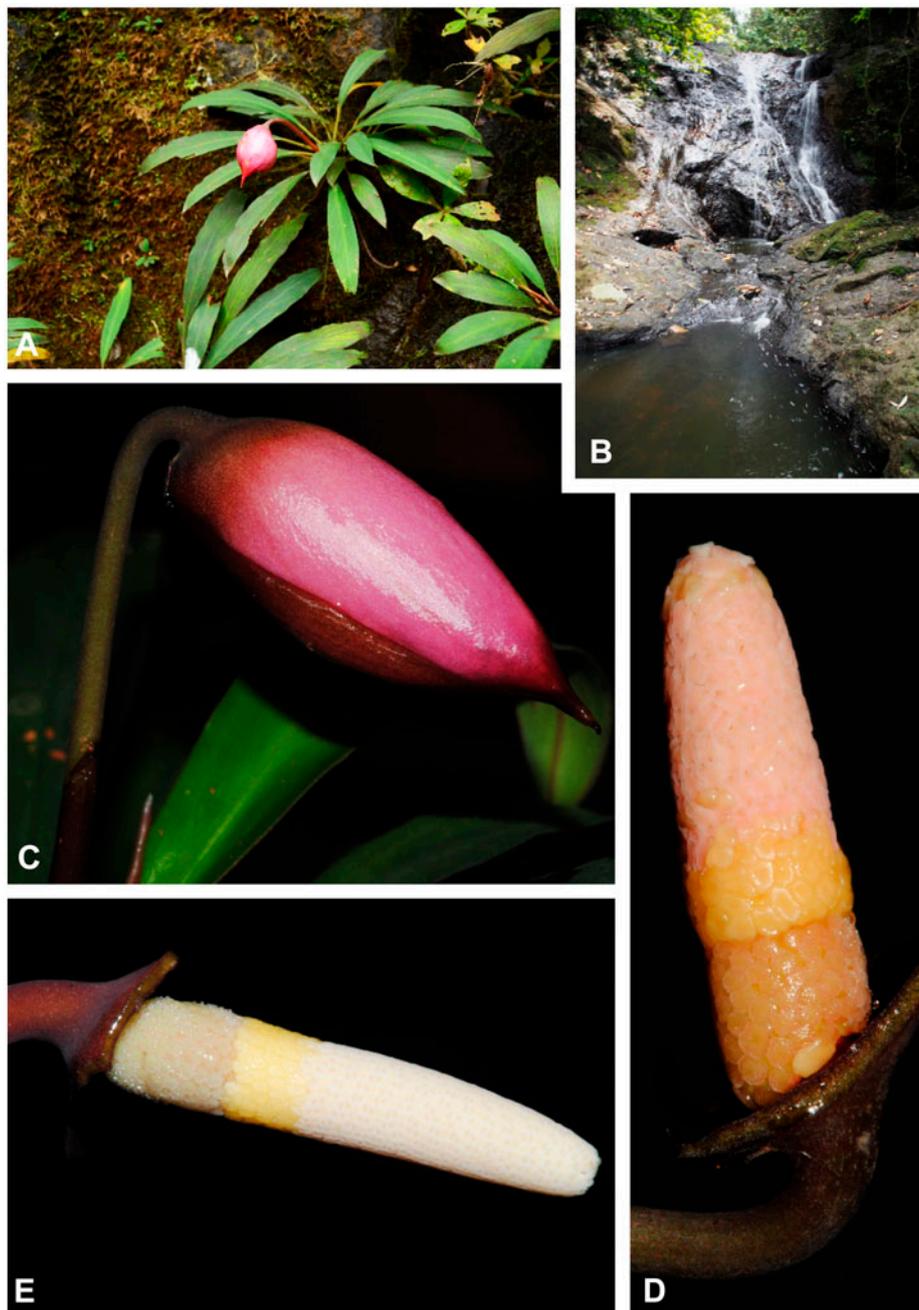


Figure 1. (A, D) *Piptospatha loi* P.C. Boyce and S.Y. Wong. (E) *Piptospatha pileata* S.Y. Wong and P.C. Boyce. (A) flowering plant in habitat on moss-covered basalt rocks. (B) type location with waterfall (Air Terjun Gelas) over basalt rocks. (C) inflorescence at pistillate anthesis. Note the deep olive green scabrid lower part of the spathe. (D) Spadix (spathe artificially removed) and pistillate anthesis. Note interstice of staminodes is wider than the remainder of the spadix. Note, too, the irregularly arranged stamens. (E) Spadix (spathe artificially removed) and pistillate anthesis. Note that the stamens are arranged in pairs. Note, too, the proportionately longer staminate flower zone. (A) taken in habitat, Tawau Hills Park, Sabah, no specimen prepared. (C, D) from *M. Lo AR-3992*. (E) from *K. Nakamoto AR-3923*. Photo credits: A. & B. © Mike Lo, used with permission; C–E. © Peter C. Boyce.

slightly obliquely inserted onto a very short stipe; **pistillate flower zone** fertile to the base but one or two large (c.  $1 \times 1.2$  mm) rhomboidal, rounded-topped cream, red-flushed staminodes inserted basally, cylindrical, base rather abruptly obtuse and overhanging the stipe, c. 5 mm long  $\times$  c. 4.5 mm in diameter; **pistils** cylindrical, truncate, very congested, c. 0.6 mm diame-

ter, pale pinkish red; **stigma** with a slight central depression, papillate, as wide as ovary, pinkish cream; pistillate and staminate zones separated by a zone c. 2.3 mm long, and somewhat wider than the remainder of the spadix, comprising of c. three whorls of irregularly arranged staminodes, these rhomboidal-polygonal, upper sides tapering basally, staminodes creamy yellow

with a conspicuous but shallow depression (most) or suture running more or less diagonally (some); **staminate flower zone** equaling the pistillate zone in width, c. 9.5 mm long  $\times$  c. 4.5 mm in diameter, slightly tapering, apex blunt, pale pinkish white, the pink colour intensified along the connective; **staminate flowers** congested except at the tip of the spadix, comprised of very irregularly paired stamens, stamen more or less oblong, with a conspicuous notch on each end corresponding to the separation of individual thecae in each pair, c. 0.5 mm wide  $\times$  c. 0.8 mm long, connective weakly impressed, minutely pubescent (at high magnification); thecae lateral, c. 0.3 mm, ellipsoid and somewhat domed. **Fruiting spathe, fruits and seeds** not observed. – Figure 1.

#### Distribution

Malaysian Borneo, East Sabah, Bahagian Tawau; so far known from only two localities c. 80 km distant.

#### Ecology

On bare or moss-covered basalt waterfall rocks under perhumid lowland forest; 200–300 m a.s.l.

#### Eponymy

Named for Michael Lo, whose extensive travelling and photography of Bornean wildlife has done so much to reveal the almost unimaginable biological richness of this remarkable island.

#### Other material examined

Malaysian Borneo, Sabah, Bahagian Tawau, Lahad Datu, Tawau Hill Park, Bukit Gelas Waterfall, 4 25 60.00 N 117 52 60.00 E, ca 450 m asl, 23 Sept. 2011, *M.Lo* (image only).

#### Notes

*Piptospatha loi* is the smallest species of tufted *Piptospatha* yet described; in overall stature, it surpasses only *P. manduensis* A. Hay & Bogner, a creeping species that although shorter than *P. loi* forms very extensive carpets on almost bare travertine. The only species that vegetatively resembles *P. loi* is *P. remiformis* Ridl., a species described from NW Borneo and known from fragmentary material (see Boyce & Wong 2012, p. 21). *Piptospatha loi* is one of several species (some still insufficiently known to permit description) with a distinctly rostrate spathe limb; together these would appear to constitute a natural assemblage of species, but this requires testing with molecular data. To date all are restricted to NE Borneo.

*Piptospatha loi* is a further example of a geologically obligated species (basalt), a trend that is prevalent in *Piptospatha*. *Piptospatha pileata*, to which *P. loi* is most similar, is restricted to riverine shales in Kalimantan Timur. Other E and NE Bornean species include *P. burbridgei* (N.E. Br.) M.Hotta and *P. deceptrix* P.C. Boyce and S.Y. Wong (both shales), *P. colata* P.C. Boyce and S. Y. Wong (granite), and the enigmatic *P. insignis* N.E. Br. (sandstone, see Boyce and Wong 2011).

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