
Studies on Schismatoglottideae (Araceae) of Borneo XXXIII – A review of the *Schismatoglottis* Tectorata Group, including description of a new species, *Schismatoglottis evelyniae*

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ABSTRACT

Schismatoglottis evelyniae P.C.Boyce & S.Y.Wong is described as a taxonomically new species in the Tectorata Group, morphologically most similar to *Schismatoglottis platystigma* M.Hotta and *S. petri* A. Hay. *Schismatoglottis evelyniae*, *S. platystigma*, *S. petri*, and *S. tectorata* are illustrated from living plants. A key to the species of the *Schismatoglottis* Tectorata Group is provided.

KEY WORDS

Araceae, Borneo, *Schismatoglottis*, Malaysia, Sarawak, Schismatoglottideae.

INTRODUCTION

Schismatoglottis is one of the larger genera of Asian aroids, with an estimated 200 species, of which somewhat less than half have now been formally described. *Schismatoglottis* species display a considerable variety of shoot architecture and leaf morphologies, combinations of which have been used to delimit informal groups (Hay & Yuzammi 2000). One such, the Tectorata Group, is defined by the very short petiolar sheaths, often reduced to only a thickened collar, with the role of protecting the next developing leaf blade being taken on by cataphylls which alternate with the foliage leaves (analogous to many *Philodendron*

species). Until now the Tecturata group has comprised five species (*Schismatoglottis jepomii* P.C.Boyce & S.Y. Wong, *S. petri* A.Hay, *S. platystigma* M.Hotta, *S. pudenda* A.Hay, and *S. tecturata* (Schott) Engl.). Of these, only *S. tecturata* and *S. petri* were included in the

Tecturata Group by Hay & Yuzammi (2000) owing to the problem in interpreting the very incomplete herbarium material of *S. pudenda* and *S. platystigma*; *Schismatoglottis jepomii* was only described later (Boyce & Wong 2006).

KEY TO THE *SCHISMATOGLOTTIS* TECTURATA GROUP

- 1. Spathe limb margins marcescent 2
 - Spathe limb shedding by deliquescing or degrading into a granular mass 3
- 2. Leaf blade abaxially glossy with the primary venation impressed; spadix appendix clavate-cylindric, distinctly thicker than staminate zone; anthers with the connective much elevated above the thecae. Brunei. Sandstones ***S. petri***
 - Leaf blade abaxially matte (or at least not glossy) with the primary venation not impressed; spadix appendix cylindric, more or less isodiametric with top of staminate zone; anthers with the connective not or hardly elevated. Widespread on Borneo and extending to the Riau Archipelago, A variety of substrates ***S. tecturata***
- 3. Leaf blades broadly lanceolate, matte medium to matte olive green, adaxially concolorous, or with the mid-rib paler; mid-rib impressed; lithophytes not associated with watercourse 4
 - Leaf blades narrowly lanceolate, glossy deep green, often spattered paler green and yellow-green; mid-rib conspicuously bluntly raised; obligate rheophytes 5
- 4. Stem ascending and rooting; leaf blades cuneate to narrowly rounded at base; petioles scabrid with broken paler striations; spadix elongate hourglass-shaped, appendix clavate, staminate flower zone narrower than the pistillate zones and the appendix; staminate flowers without an expanded collar; the staminodes of the interstice expanding laterally at the onset of staminate anthesis. NW Borneo. Limestone ***S. evelyniae***
 - Stem condensed, leaf blades shallowly cordate; petioles smooth; spadix conic-cylindric; appendix conic; staminate flower zone stout and wider than the rest of the spadix; staminate with a distinctive expanded collar; staminodes of the interstice not expanding. NE Sarawak, Brunei. Sandstones ***S. platystigma***
- 5. Spadix appendix stoutly clavate; appendix staminodes not well-defined, the apices almost flat and with a suture in the middle; NW Sarawak. Sandstones ***S. jepomii***
 - Spadix appendix only slightly expanded; appendix staminodes well-defined, the tops convex and smooth; SW Sarawak. Shales ***S. pudenda***

Schismatoglottis evelyniae P.C.Boyce & S.Y.Wong, **sp. nov.** Type: Malaysian Borneo, Sarawak, Kuching Division, Bau District, Krokong, Kampung Tringgus, Sungai Bong, 01° 15 '32.2" N 110° 05' 37.2" E, 27 June 2006, P.C.Boyce, *Jeland ak Kisai & Wong Sin Yeng AR-1846* (SAR, holo; alcohol preserved).

Diagnosis

Schismatoglottis evelyniae is morphologically most similar to *S. platystigma* M.Hotta, but distinguished by ascending & rooting (not condensed) stem, the cuneate (not shallowly cordate) leaf bases, the scabrid (not smooth) petioles, by the spadix elongate hourglass-shaped (vs conic-cylindric), with the appendix clavate (not conic), and the slender staminate flower zone narrower than the pistillate zones and the appendix (vs stout and wider) with staminate flowers lacking the distinctive expanded collar present in *S. platystigma*, and by the staminodes of the interstice expanding laterally at the onset of staminate anthesis. *Schismatoglottis evelyniae* is also rather similar to *S. petri* in sharing a narrowly rounded to cuneate leaf base and clavate staminate appendix, but is readily distinguished by matte (not glossy) leaf blades, the flat (not extended) anther connective, and by the caducous (not marcescent) spathe limb

Description

Lithophytic herb to 50 cm tall. **Stem** ascending and elongated, rooting as it grows, shoot modules pleionanthic, c. 2 cm

diam. **Leaves** several together, alternating with stout, somewhat brittle tapering lanceolate scabrid cataphylls to 10 cm long; **petiole** up to 35 cm long, 1.5 cm diam., sheathing only at extreme base, the sheath forming a conspicuous collar, scabrid matte medium green with conspicuous paler broken striations; **leaf blade** somewhat brittle coriaceous, matte pale to medium green adaxially, paler abaxially, elliptic, to 29 cm long × 10 cm wide, the base cuneate, the tip rather abruptly acuminate for 1.5–2 cm; midrib adaxially impressed, abaxially prominent; primary lateral veins adaxially rather obscure, distinct abaxially, not prominent, ca 15 on each side of midrib, diverging at 45–60°, alternating with lesser interprimary veins and running into a intramarginal vein ca 1.5 mm from the margin; secondary venation adaxially obscure, abaxially very faint, arising from the midrib. **Inflorescence** solitary, subtended by a lanceolate cataphyll and a 2-keeled prophyll both to ca 4 cm long; **peduncle** very short, obscured by cataphylls. **Spathe** ca 9 cm long; lower spathe glossy pale green, squat subcylindric, oblique-based, ca 2 cm long × 1 cm diam., differentiated from the limb by a slight constriction; **spathe limb** caducous, degrading into a granular mass, gaping and somewhat cucullate at pistillate anthesis, reflexing and falling at staminate anthesis, c. 7 cm long, apically mucronate, white, degrading to dirty greyish. **Spadix** sessile, ca 7 cm long; pistillate flower zone ca 1.2 cm long, obliquely inserted but not adnate to the spathe; **pistils** ovoid, crowded, ca 1.5 mm diam. white; **stigma** sessile, globose



Figure 1



Figure 2

Figure 1. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [Kampung Sadir, Sarawak]. Plants in habitat showing the ascending rooting stem.

Figure 2. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [Kampung Sadir, Sarawak]. Detail of the ascending, rooting stem.

discoid, as wide as the ovary, ca 0.7 mm diam.; interpistillar staminodes absent; **sterile interstice** ca 4 mm long \times 5 mm diam., a few whorls of clavate staminodes ca 1 mm across, these expanding laterally at onset of staminate anthesis, medium yellow; **staminate flower zone** 2 cm long, held partly within the lower spathe chamber, slender and somewhat attenuate, narrower than the pistillate zone and the appendix. ca 3–4 mm diam.; stamens crowded, ivory; anther sessile, connective flat, ca 0.25 mm

across, flat-topped, polygonal; **spadix appendix** clavate, about twice as thick as the male zone, c. 6 mm diam., composed of columnar (lowermost malformed owing to pressure from the spathe limb) impressed-topped, irregularly polygonal (sometimes united), medium yellow staminodes each ca 0.8 mm diam. *Infructescence* with the spathe limb shed and the lower spathe persisting; mature infructescence not observed.



Figure 3



Figure 4

Figure 3. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-1846].
Close-up of the collar-like much-reduced petiolar sheath.

Figure 4. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-1846].
Cataphyll protecting an emerging leaf.

Distribution — NW Borneo, so far as known restricted to S Kuching and Samarahan Divisions (Sarawak, Malaysian Borneo), and to Nanga Taman, Sekadau Regency (Kalimantan Barat, Indonesian Borneo).

Ecology — Lithophytic on vertical clay-covered limestone cliffs under tropical lowland moist evergreen forest at 60–250 m asl.

Eponymy — Named for Evelyn ak Bidel, formerly one of the nursery staff at Malesiana Tropicals. Evelyn contributed much to the well-being of the living collection at that time, and it was under her attention that this plant first flowered and revealed itself as undescribed.

Other material examined — MALAYSIAN BORNEO. Sarawak. **Kuching Division:** Bau District, Krokong, Kampung Tringus, 01° 43' 18.9" N 109° 42' 53.8" E, 19 Feb.



Figure 5



Figure 6

Figures 5,6. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-1846].

Emerging inflorescence subtended by a cataphyll (right) and a 2-keeled prophyll (left). Note that the petiolar sheath on both leaves is larger than that in **Figure 3**.

2005, P.C.Boyce, R.Kneer & Jeland ak Kisai AR-994 (SAR); Padawan District, Kampung Sadir, Simpang Banyak, 1 May 2005, Simon Kutub ak Paru AR-1818 (SAR); Kuching District, Siburan, Kampung Sikog, Air Terjun Baan Gong, 01° 20' 16.1" N 110° 20' 09.6" E, 26 July 2009, P.C.Boyce & Wong Sin Yeng AR-2580 (SAR). **Samarahan Division:** Serian District, Pichin, Utak Manangi, 28 Dec 2004, Simon Kutub ak Paru AR-937 (SAR); Serian District, Pichin, Umon Murut, Tiab Belanting, 01° 08' 03.7" N 110° 27' 00.3" E, 22 June 2005, P.C.Boyce

& Jeland ak Kisai AR-1257 (SAR); Serian, Pichin, Sungai Umpuh, 01° 07' 24.2" N 110° 27' 07.7" E, 25 Jan. 2006, P.C.Boyce, Jeland ak Kisai & Simon Kutub ak Paru AR-1680 (SAR); Serian, Pichin, Tubih Tahang, Sipukam, 01° 07' 16.6" N 110° 26' 51.2" E, 26 July 2005. P.C.Boyce, Jeland ak Kisai, Mael ak Late, Simon Kutub ak Paru & Tebas ak Libui AR-1309 (SAR). **INDONESIAN BORNEO.** Kalimantan Barat. **Sekadau Regency:** Nanga Taman, 2 hours walk to west from Simpang Tapang Perodah, 23km south of Kayu Lapis and 19 km main road



Figure 7



Figure 8

Figure 7. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-3942].

Inflorescence at early pistillate anthesis. Note that the spathe limb is gaping slightly.

Figure 8. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-1846].

Inflorescence at late pistillate anthesis. The damage to the spathe limb is owing to the chrysomelid beetle. Such damage is typically seen in wild plants.

west of Sekadau, 22 May 2012, 0° 09' 56.64" S 111° 03' 28.67" E, 22 May 2012, K.Nakamoto AR-3942 (BO, SAR).

Notes — In habitat *Schismatoglottis evelyniae* forms large colonies on vertical clay-covered limestone banks in deep shade and is unusual for the genus in possessing an ascending rhizome-like stem that roots as it grows (**Figure 1 & 2**). As with other species of the Tecturata Group the petiolar sheath

is mostly reduced to a thickened collar (**Figure 3**), with the protective role of the sheath taken over by the cataphylls that alternate with the foliage leaves (**Figure 4**). An exception to this are the two foliage leaves before an inflorescence, where the sheath is somewhat more developed (**Figure 5**) and the cataphyll accordingly reduced. The solitary inflorescence emerges from the second foliage leaf, and is immediately surrounded by a cataphyll



Figure 9



Figure 10

Figure 9. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-1846].

Detail of typical damage to the spadix appendix caused by chrysomelid beetles.

Figure 10. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-3942].

Spadix at late pistillate anthesis, spathe artificially removed. Note that the interstice staminodes have expanded.

(**Figure 6**, right hand side of spathe) and a 2-keeled prophyll (**Figure 6**, left hand side of spathe). The spathe gapes slightly at pistillate anthesis (**Figure 7**) at which time it produces a powerful esteric-like smell. In nature inflorescences are exclusively visited by beetles of the Chrysomelidae (**Figure 8**), and almost always show sign of damage to the spathe limb (**Figure 8**) and the spadix appendix (**Figure 9**). During staminate anthesis the staminodes separating the

pistillate and staminate flower zones abruptly (in about 10 mins) expands laterally (**Figure 10 & 11**). The spathe limb opens fully and reflexes at staminate anthesis, and very quickly darkens and degrades into a granular mass (**Figure 12 & 13**). The spathe limb is soon completely lost, with the developing infructescence held within the urceolate persistent lower spathe. Ripe infructescences have yet to be observed, and thus is not yet known whether the



Figure 11

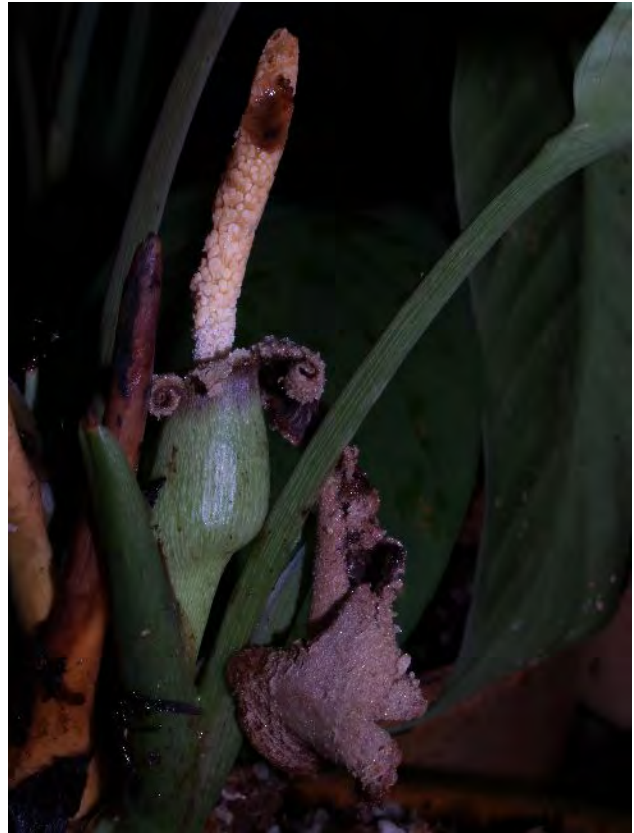


Figure 12

Figure 11. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-3942].

Detail of the expanded interstice staminodes.

Figure 12. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-1846].

Spathe limb degrading post anthesis.

lower spathe splits basiscopically (as in *S. jepomii* and *S. pudenda*, and indeed most *Schismatoglottis*), or acroscopically as, so far uniquely, in *S. tectorata* (**Figure 14**).

Despite the seemingly unique (for *Schismatoglottis*) shared morphologies of a very reduced petiolar sheath and the protective role of the cataphylls, preliminary molecular analyses fails to provide support of the monophyly of the Tectorata Group, with the three sampled species (*S. evelyniae*, *S.*

jepomii, and *S. tectorata*) falling in different lineages. While more sampling is obviously needed, it does seem probable that molecular analyses will reveal *S. evelyniae* and (as yet unsampled) *S. platystigma* to be closely allied, although *S. platystigma* is readily differentiated by its conic-cylindric spadix and conical appendix (**Figure 15**), by having the staminate flower zone wider than the pistillate zone and appendix, and by the distinctive expanded collar to the staminate flowers, which is diagnostic for *S. platystigma*



Figure 13



Figure 14

Figure 13. *Schismatoglottis evelyniae* P.C.Boyce & S.Y.Wong [AR-1846].

Spathe limb degrading post anthesis. Note the pollen visible on the staminate flower zone.

Figure 14. *Schismatoglottis tectorata* (Schott) Engl. [AR-1606].

Mature infructescence with the persistent lower spathe splitting and opening acroscopically to reveal the ripe fruits.

(**Figure 16**), and by the staminodes of the interstice not laterally.

Schismatoglottis petri is also rather similar to *S. evelyniae* by the cuneate to narrowly rounded leaf base, and the clavate staminate appendix, but is readily distinguished by the caducous (not marcescent) spathe limb, the glossy leaf blades, and the extended triangular anther connective, and by

caducous (not marcescent) spathe limb (**Figure 17**).



Figure 15



Figure 16

Figure 15. *Schismatoglottis platystigma* M.Hotta [AR-2289].

Spadix at staminate anthesis, spathe artificially removed.

Figure 16. *Schismatoglottis platystigma* M.Hotta [AR-2289].

Spadix at pistillate anthesis, spathe artificially removed. Note the distinctive collar of the staminate flowers.



Figure 17

Figure 17. *Schismatoglottis petri* A.Hay [P.C.Boyce 283].
Note the marcescent spathe limb.

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