WEBBIA Journal of Plant Taxonomy and Geography

Firenze University Press
www.fupress.com/webbia

OPEN ACCESS

Citation: Wong S.Y., Lo M., Boyce P.C. (2023) Schismatoglottideae (Araceae) of Borneo LXXVI — Two new *Burttianthus* species from Sarawak. *Webbia. Journal of Plant Taxonomy and Geography* 78(2): 123-129. doi: 10.36253/jopt-15209

Received: September 22, 2023

Accepted: September 30, 2023

Published: October10, 2023

Data Availability Statement: All relevant data are within the paper and its Supporting Information files.

Competing Interests: The Author(s) declare(s) no conflict of interest.

Editor: Alistair Hay

ORCID
WSY: 0000-0003-4042-9672
PCB: 0000-0002-5856-9561

Schismatoglottideae (Araceae) of Borneo LXXVI — Two new *Burttianthus* species from Sarawak

Wong Sin Yeng[1,2,*], Michael Lo[3], Peter C. Boyce[4]

[1] *Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak 94300 Kota Samarahan, Sarawak, Malaysia*
[2] *Harvard University Herbaria, Cambridge, MA, USA*
[3] *Tropic City Apartment, Unit C5-8, No.85, Lorong Tabuan Dayak 16, 93350 Kuching, Sarawak, Malaysia*
[4] *Dipartimento di Biologia, Centro Studi Erbario Tropicale (herbarium FT), University of Florence, Via G. La Pira 4, 50121, Firenze, Italy*
*Corresponding author. E-mail: sywong@unimas.my

Abstract. Two new species of *Burttianthus* are described from Sarawak: *B. rejangicus* from the Rejang and Balleh rivers of the western Rejang Basin, and *B. solus* from the Similajau Basin, Bintulu. Both novelties are illustrated from living plants and the spadices of eight of the nine *Burttianthus* species are compared in accompanying figures.

Keywords: Araceae, *Burttianthus*, Malaysia, Kapit Division, Bintulu Division, Borneo.

INTRODUCTION

Burttianthus S.Y.Wong, S.L.Low & P.C.Boyce (Low et al. 2018) is a genus of seven species, two further herein described, of obligate Steenisian rheophytes (Boyce and Wong 2019) restricted to N Borneo, occurring from the Tatau Basin of Bintulu, through Brunei (although apparently absent from the eastern part of the country), to Lawas wedged between the eastern portion of Brunei and Sabah. The species are divisible into three groups. Five described species, including the type of the genus, *B. caulescens* (M.Hotta) S.Y.Wong & P.C.Boyce, plus the two here proposed, have numerous glabrous staminate florets arranged in longitudinally aligned pairs, with the horns inside the lip of the anther cavity when the rim is thick, to more or less marginal when rim is thin, and an absent or vestigial appendix. Another group, with three species including *Burttianthus veluntandrus* (S.Y.Wong, S.L.Low & P.C.Boyce) S.Y.Wong & P.C.Boyce, has at most two spirals of pubescent staminate florets of similar structure to the preceding, and an appendix accounting for up to half the spadix. The third group, comprising *B. longipedunculatus* (M.Hotta) S.Y.Wong & P.C.Boyce and *B. purseglovei* (Furtado) S.Y.Wong & P.C.Boyce, have anthers with the rims very thin, and long thecae horns

exserted far from the anther cavity, with the numerous glabrous staminate florets arranged in longitudinally aligned pairs, and the spadix fertile to the tip.

Burttianthus is unusual among obligate schismatoglottid rheophytes in that species are frequently co-occur, as for example at Bukit Kana in the western Tau Range where *B. caulescens* and *B. longipedunculatus* and *B. purseglovei* occur, although in different ecologies, and at Mulu where *B. hansenii* (Bogner) S.Y.Wong & P.C.Boyce and *B. purseglovei* are respectively on upper hillforest sandstones and on lowland shales. A further peculiarity of the genus is the seemingly relatively widespread nature of some of the species — *B. caulescens* and *B. purseglovei* apparently occur almost throughout the lowland range of the genus, in stark contrast to many other taxa in the tribe in which species' distributions are often extremely restricted. However, these apparently widespread distributions may equally be owing to imprecise taxonomy. Certainly, this appears to be the situation with *B. caulescens* wherein the problem is exacerbated by inadequate field observations and overreliance on poor quality of herbarium material, resulting in several cryptic species having been obscured.

Here we describe two new species that until now have remained undetected within a too widely circumscribed *B. caulescens*.

Geology in this paper is specified based on Hutchinson (1989, 2005) and Tate (2001).

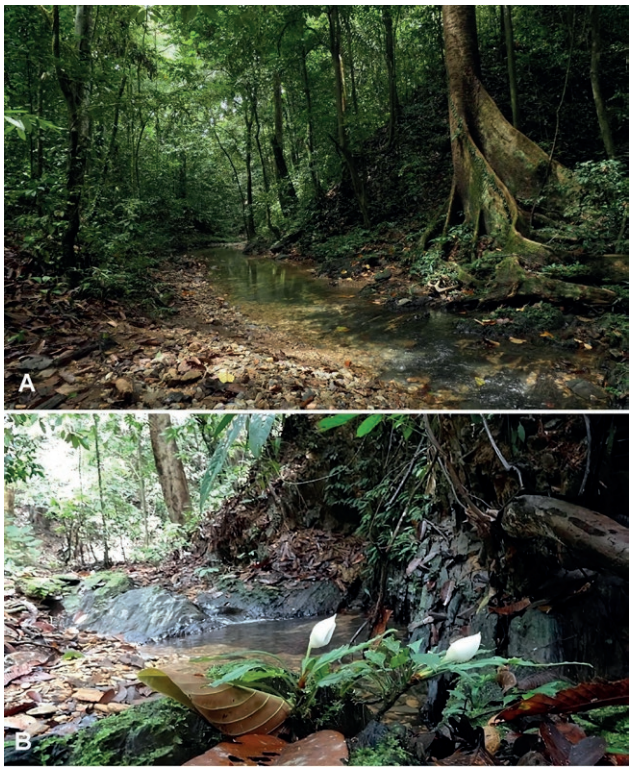

Figure 1. *Burttianthus rejangicus* S.Y.Wong, M. Lo & P.C.Boyce. A. Habitat. B. Plants flowering in habitat. Photos: Mike Lo.

Burttianthus rejangicus S.Y.Wong, M.Lo & P.C.Boyce, **sp. nov.**

Type: Malaysia. Sarawak, Kapit, Kapit town, Sungai Seranau, 2°02'00.7"N 112°57'01.8"E, 66 m asl. 29 Dec 2021, *Wong Sin Yeng & P.C.Boyce AR-5317* (holotype SAR!; isotype SAR - spirit!). (Figures 1, 2, 3 & 5C).

Diagnosis

Burttianthus rejangicus is unique by the fusiform pistillate floret zone narrower than the staminate floret zone, the almost inflated rims to the stamens, and by the dull pale green stigmas with a central depression.

Description

Small obligate Steenisian rheophytes to 20 cm tall, but usually about half this. Stem initially congested with numerous leaves in a terminal tuft, older plants with stems sub-decumbent and rooting from the lower parts with the active portion erect, 1–6 cm long, 3–4 mm in diam.; petiole ca 2.5 cm long, ca 1.5 mm in diam., adaxially canaliculate, sheathing at extreme base; petiolar sheath with wings extended into a very narrowly triangular ligular portion 2 cm long soon drying dark red-brown and then marcescent; blade thinly coriaceous, adaxially dark green, paler abaxially, elliptic to elliptic-lanceolate, 2.5–7 cm long × ca 1 cm wide, base narrowly cuneate, apex acute, apiculate for ca 1 mm, margin somewhat thickened and smooth to conspicuously undulate; midrib adaxially and abaxially prominent, primary lateral veins indistinguishable from interprimary venation, diverging at 20–35° and running to a more or less thick marginal vein; secondary venation adaxially and abaxially very faint to completely obscure; tertiary venation mostly completely obscure in living material, forming a faint tessellate reticulum in dry material. Inflorescence solitary; peduncle stout, exceeding petioles, ca 2 cm long × 1.5 mm in diam., terete, pale green; spathe more or less ovoid with apex recurved, not constricted, ca 4 cm long and apically beaked to ca 5 mm; lower part campanulate, green, persistent, upper part gaping at anthesis, glistening white with the dorsal median middle part stained green, caducous during or just following staminate anthesis, apical beak medium

Figure 2. *Burttianthus rejangicus* S.Y.Wong, M. Lo & P.C.Boyce. A. Bloom at pistillate anthesis. B. Bloom at pistillate anthesis, nearside spathe artificially removed. Photos: P.C.Boyce.

Figure 3. *Burttianthus rejangicus* S.Y.Wong, M. Lo & P.C.Boyce. A. Bloom at onset of staminate anthesis, spathe limb beginning to shed. B. Bloom at late staminate antheses, spathe limb fallen to leave the persistent lower spathe. Photos: P.C.Boyce.

green. Spadix stoutly cylindrical, ca 3.5 cm long, ca 1 cm in diam.; pistillate floret zone ca 7 mm long, fusiform, narrower than remainder of spadix, comprised of 5–6 crowded spirals of sub-globose pistils ca 1.5 mm in diam.; stigma sessile, discoid, centrally impressed, slightly wider than ovary, closely appressed to the neighbouring stigmas, dull medium green; interpistillar staminodes confined to a row along spathe/spadix adnation, rhomboid-topped, very shortly stalked, medium yellow, ca 0.9 mm in diam., very slightly shorter than pistillate florets; sterile interstice furnished with a single row of much-reduced sterile stamens, these clavate with the tops narrowly hollowed out, pale yellow; staminate floret zone ca 2.5 cm long, composed of many crowded spirals of fertile glabrous stamens arranged in longitudinally aligned pairs with each staminate floret interpreted as being composed of two stamens, these slightly obliquely facing one another with the deeply excavated thecae together on inner (with respect to stamen pairs) side of anther, stamens ellipsoid to ellipsoid-oblong from above, ca 1 mm long × 2 mm wide; thecae separated by a ridge forming a septum in the cavity, the outer margins of each stamen thickened and inrolled, very shortly horned, the horns inside the lip of anther cavity and pointing laterally, glossy pale yellow; appendix ca 1 cm long, comprised of individualized sterile stamens and patches for diminutive sterile florets. Fruiting spathe thick-walled, obconic fruits and seeds not observed.

Etymology

From Rejang, plus Greek *-ikos* [*-icos*], indicating belonging to.

Distribution

Known only from the Rejang and Balleh rivers of the western Rejang basin where the small populations are widely scattered.

Ecology

Exposed shales in the flood zone along forest streams under lowland perhumid forest, very occasion-

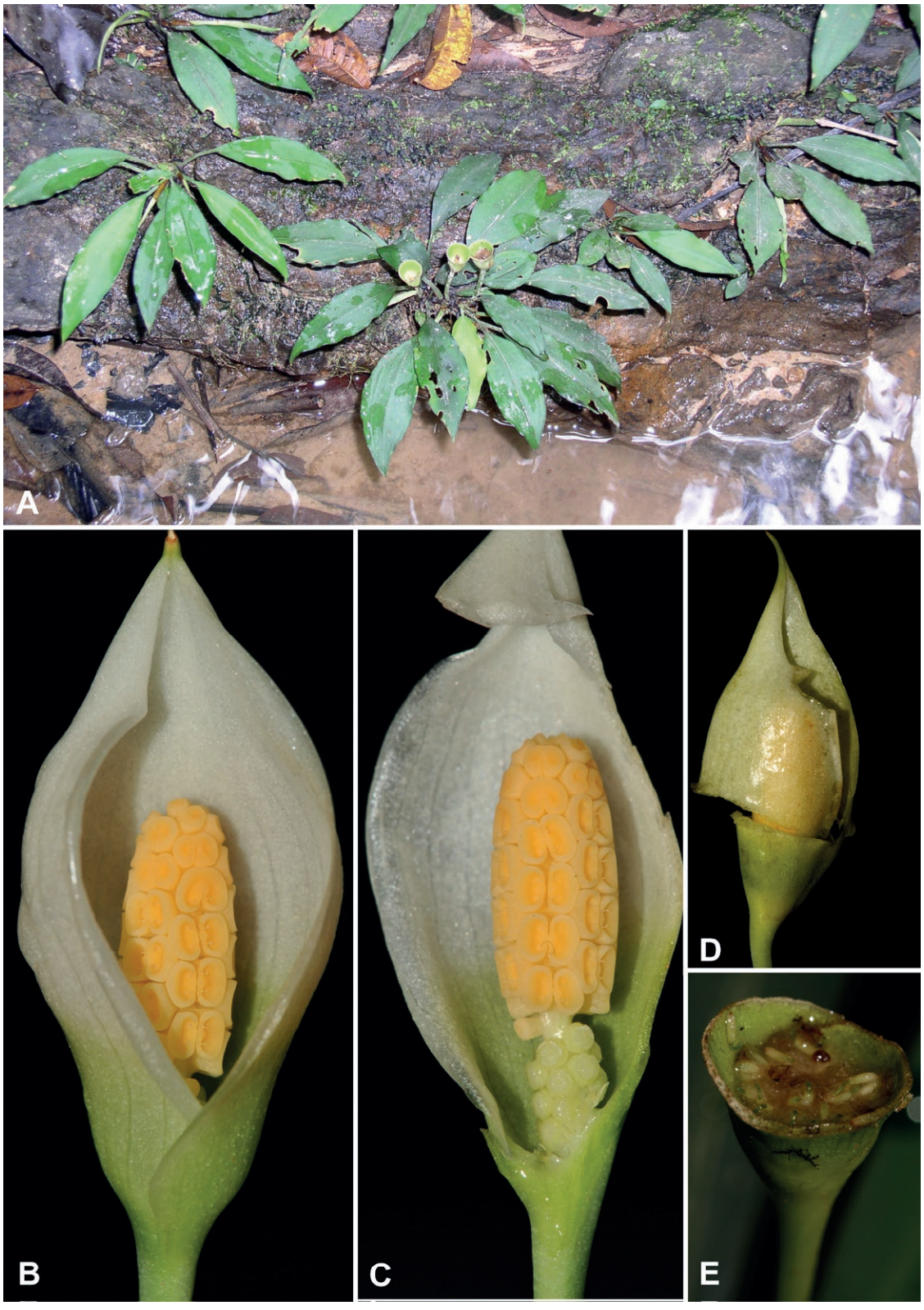

Figure 4. *Burttianthus solus* S.Y.Wong, M. Lo & P.C.Boyce. A. Plants in habitat. B. Bloom during pistillate anthesis. C. Bloom at pistillate anthesis, nearside spathe artificially removed. D. Bloom at onset of staminate anthesis, spathe limb beginning to shed. E. Lower persistent splash-cup spathe with the fruits decomposing and seed beginning to germinate. Photos: P.C.Boyce.

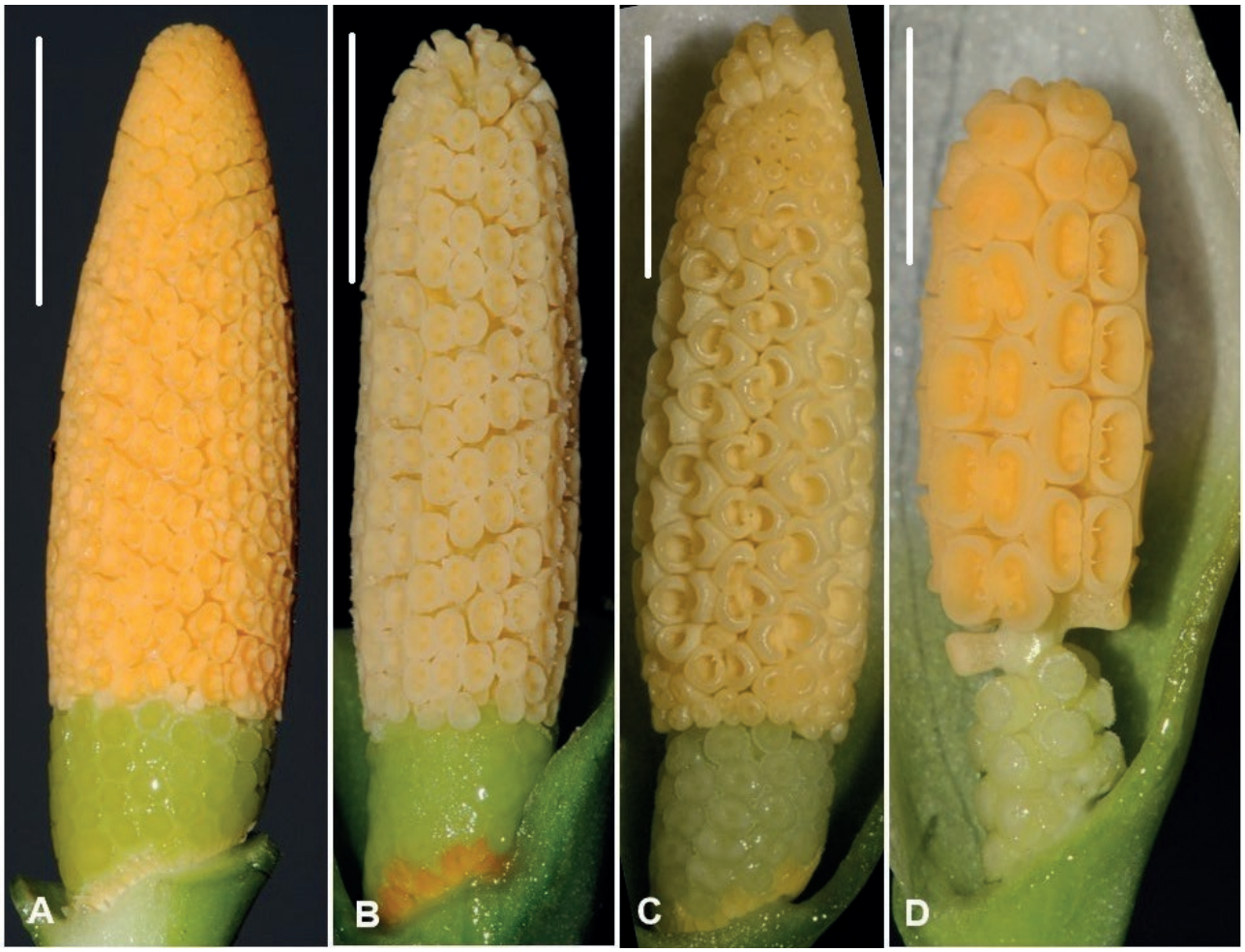

Figure 5. Spadix comparisons. A. *Burttianthus caulescens*. B. *Burttianthus hansenii*. C. *Burttianthus rejangicus*. D. *Burttianthus solus*. Scale bar = 1 cm. Photos: P.C.Boyce.

ally occurring in sheltered parts of the banks of larger rivers.

Notes

In the absence of provenance and without examining the spadix, plants of *B. rejangicus* are virtually indistinguishable from *B. caulescens* (Fig. 5A) and *B. hansenii* (Fig. 5B). A similar situation exists with the long-confounded *B. longipedunculatus* (Fig. 6A) and *B. purseglovei* (Fig. 6B).

Additional specimens examined (paratypes)

MALAYSIA. Sarawak. Kapit, Pelagus Rapids, Woodpecker Trail, 2°11'15.1"N 113°03'29.01"E, 70 m asl., 14 Mar 2005, *P.C.Boyce, Jeland ak Kisai & Jepom ak Tisai AR-1036* (SAR); Kapit, Belaga, km 10 Bakun - Bintulu-Miri road junction, 2°50'51.7"N 114°01'57.6"E, 182 m asl., 11 Oct 2005, *P.C.Boyce, Jeland ak Kisai & Jepom ak Tisai AR- 1395* (SAR); Kapit, Pelagus Rapids, Woodpecker Trail, 2°11'15.1"N 113°03'29.01"E, 70 m asl, 1 Dec 2004, *Jeland ak Kisai AR-779 (SAR)*; Kapit, Belaga, Bakun Dam, Sungai Linau, 2°31.950'N 114°13.161'E, 299 m asl., 2 Oct 2017, *Mike Lo AR-2825* (SAR); Kapit, Batang Balleh, Nanga Putai, 2°01'0.0"N 113°01'0.0"E, 20 m asl, 29 May 2013, *Kazuya Nakamoto AR- 4162* (SAR).

Burttianthus solus S.Y.Wong, M.Lo & P.C.Boyce, **sp. nov.**

Type: Malaysia. Sarawak, Bintulu, Similajau N.P., Batu Anchau trail, 3°21'21.8"N 113°09'41.0"E, 36 m asl., 1 Sep 2012, *Mike Lo AR-4033* (holotype SAR!; isotype SAR - spirit!). (Figures 4 & 5D).

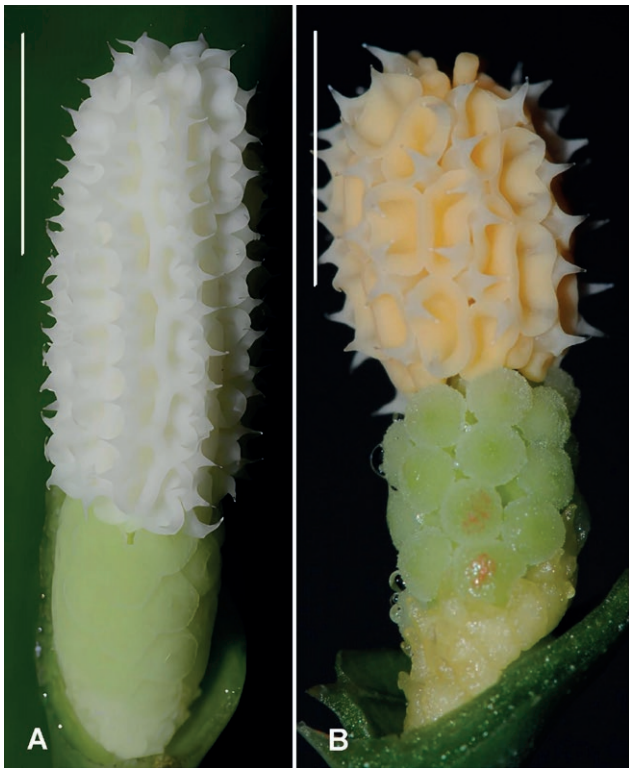

Figure 6. Spadix comparisons A. *Burttianthus longipedunculatus*. C. *Burttianthus purseglovei*. Scale bar = 1 cm. Photo A: Mike Lo; B: P.C.Boyce.

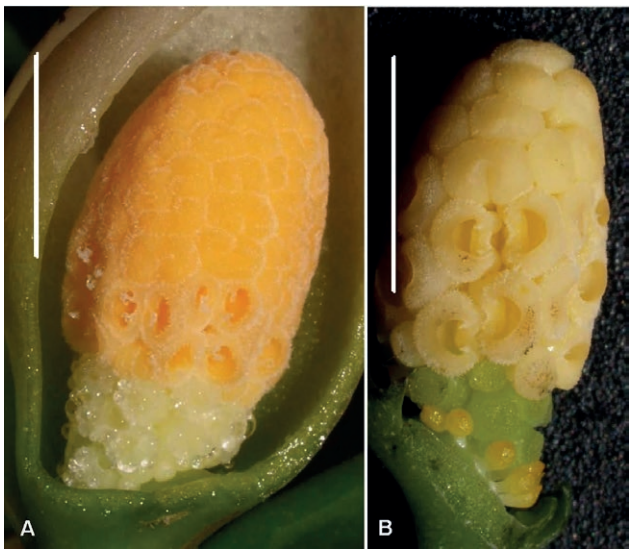

Figure 7. Spadix comparisons. A. *Burttianthus spissus*. B. *Burttianthus velutandrus*. Scale bar = 5 mm. Photos: P.C.Boyce.

Diagnosis

Burttianthus solus is distinguished from all other species by the pistillate and staminate zones of florets separated by a naked interstice, and further by the lax (not congested) pistillate florets.

Description

Small obligate Steenisian rheophytes to 10 cm tall. Stem short, 1–5 cm long, 3–4 mm in diam. Leaves few together, tufted; petiole ca 2.5 cm long, ca 1.5 mm in diam., adaxially canaliculate, sheathing at extreme base; petiolar sheath with wings extended into a very narrowly triangular ligular portion 1.5 cm long drying dark brown and then soon marcescent; blade coriaceous, adaxially medium green, paler abaxially, elliptic to elliptic-lanceolate, 2.5–4 cm long × ca 1 cm wide, base narrowly cuneate, apex acute, apiculate for ca 1 mm, margin somewhat thickened and slightly undulate; midrib abaxially very prominent, adaxially prominent, primary lateral veins indistinguishable from interprimary venation, diverging at 20–35° and running to a more or less thick marginal vein; secondary venation adaxially and abaxially very faint to completely obscure; tertiary venation mostly completely obscure in living material, forming a faint tessellate reticulum in dry material. Inflorescence solitary; peduncle stout, exceeding petioles, ca 3 cm long × 1 mm in diam., terete, pale green; spathe more or less ovoid with a recurved apex, not constricted, ca 4 cm long and apically beaked to ca 5 mm mm; lower part campanulate, green, persistent, upper part gaping at anthesis, glistening white with the dorsal median middle part stained green, caducous during or just following staminate anthesis, apical beak medium green. Spadix stoutly cylindrical, ca 3 cm long, ca 1 cm in diam.; pistillate flower zone ca 8 mm long, cylindrical, about half the width of the remainder of spadix, comprised of ca 3 spirals of pistils; pistils lax, sub-oblong globose, ca 1.5 mm in diam.; stigma sessile, discoid, slightly wider than ovary, individual stigmas not contiguous to others, greenish white; interpistillar staminodes absent; sterile interstice ca 2.5 mm long, very pale green, naked except for one or maybe two solitary sterile stamens, these narrowly clavate with truncate tops; staminate floret zone ca 2 cm long, composed of ca 6 spirals of fertile flowers arranged in longitudinally aligned pairs; staminate flowers glabrous, crowded, each composed of two excavated stamens, truncate, the deeply excavated parts slightly obliquely facing and each with thecae together on inner (with respect to stamen pairs) side of anther, ellipsoid to ellipsoid-oblong from above, ca 1 mm long × 2 mm wide; thecae separated by a ridge forming a septum in cavity, the outer margins of each stamen thickened and inrolled, very shortly horned, with horns inside lip of anther cavity, medium yellow with the rims paler;

appendix absent. Fruiting spathe thick-walled, obconic fruits oblong-cylindric, truncate, ca. 2 mm long; seeds ellipsoid with a well-developed hooked micropylar extension ca 1.5 mm long.

Etymology

Latin, *sōlus* (feminine *sōla*, neuter *sōlum*); alone, sole, only, by oneself with no others around – in allusion to the separation of the pistillate and staminate zones, and the laxly arranged pistillate florets.

Distribution

Northern Bintulu where it is known from three very restricted populations in the Similajau Basin. At the Type locality *B. solus* occurs mixed with (but is very much rarer than) *B. velutandrus* (Fig. 7 B). *Burttianthus solus* is more abundant at the other two localities, but both these sites are threatened by housing developments. The Air Terjun Baloi population occurs intermixed with the locally endemic *Schismatoglottis heterodoxa* S.Y.Wong (Wong 2012).

Ecology

Exposed Oligocene sandstone boulders and waterfalls in the flood zone of small streams under rather open humid lowland forest.

Notes

As with the preceding *Burttianthus rejangicus* it is necessary to examine the spadix of *B. solus* to distinguish it from *B. caulescens* (Fig. 5A) and *B. hansenii* (Fig. 5B).

Additional specimens examined (paratypes)

MALAYSIA. Sarawak, Bintulu, Kidurong, Air Terjun Kidurong, 3°13'34.5"N 113°04'27.0"E, 75 m asl., 1 Oct 2019, *Wong Sin Yeng, A. Hay & P.C.Boyce AR-4193* (SAR). Sarawak, Bintulu, Air Terjun Baloi, 3°08'34.5"N 113°04'17.2"E, 50 m asl., 9 Aug 2013, *Wong Sin Yeng & P.C.Boyce AR-4198* (SAR).

ACKNOWLEDGEMENTS

Fieldwork was most recently under Sarawak Forestry Department Permission to Conduct Research on Biological Resources – Permit No. (67) JHS/NCCD/600-7/2/107/Jld.2 and Park Permit No WL33/2019. The collaboration and support of the Sarawak Forestry Department and the Sarawak Biodiversity Centre are gratefully acknowledged. The second author extends his thanks to Tan Sri Datuk Amar Leonard Linggi Anak Jugah and Malesiana Tropicals Sdn Bhd for continued support and encouragement.

REFERENCES

Boyce PC, Wong SY. 2019. Borneo and its disproportionately large rheophytic aroid flora. Gardens' Bulletin Singapore. 71(Suppl. 2): 497–524.

Hutchinson CS. 1989. *Geological Evolution of South-East Asia*. Oxford University Press, Malaysia.

Hutchinson CS. 2005. *Geology of north-west Borneo: Sarawak, Brunei and Sabah*. Elsevier, The Netherlands.

Low SL, Wong SY, Boyce PC. 2018. Naming the chaos: generic redelimitation in Schismatoglottideae (Araceae). Webbia. 73(1): 1–100.

Tate RB. 2001. *The Geology of Borneo Island*. CD-ROM. Persatuan Geologi Malaysia: Geological Society of Malaysia.

Wong SY. 2012. Studies on Schismatoglottideae (Araceae) of Borneo XXI: Two new species of *Schismatoglottis calyptrata* Group: *Schismatoglottis heterodoxa* and *Schismatoglottis ranchanensis*. Willdenowia. 42: 255–260.