

Schismatoglottis guabatuensis (Araceae), a New Species Discovered on Batu Caves, Selangor

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Discovery of The New Species

To build up a comprehensive checklist of species on karst limestone hills it is necessary to scramble all over the hill and cover all the many microhabitats that are each home to a specific suite of species. Batu Caves is very unusual in having a few high hanging valleys that are narrow and shaded with the soil-covered valley bottom permanently wet. Here there are species that are not found anywhere else on Batu Caves, like *Typhonium fultum*, first collected by H.N. Ridley more than a hundred years ago and only refound by the KEP¹ team during the Batu Caves Scientific Expedition 2019. Other species typical of wet habitats like *Cyrtandra pendula* (Gesneriaceae) and the fern *Tectaria nayeri* (Tectariaceae) are also found here. One of these hanging valleys was filled knee-deep in a *keladi*, which from its leaves was certainly a *Schismatoglottis* (Araceae). Search of the hundreds of plants on several occasions did not reveal a single inflorescence either in flower or fruit.



Figure 1. *Typhonium fultum* (Araceae). An extremely rare Endangered aroid species, first collected and described in 1904 from Batu Caves and rediscovered during the Batu Caves Scientific Expedition 2019. (Photo: Ethan Y.H. Cheah).



Figure 2. The wet valley bottom filled with a population of *Schismatoglottis guabatuensis*. (Photo: Ethan Y.H. Cheah).

Fortunately, P.C. Boyce was visiting KEP and immediately identified the sterile plant as a new species. Plants were then established in the KEP nursery under the care of Ong Poh Teck. Then we waited and waited and waited for them to flower. After more than a year, they produced their typical inflorescences and the aroid specialists S.Y. Wong and P.C. Boyce were able to describe it as a new species, which they named *Schismatoglottis guabatuensis* after its only known locality. (Gua, Malay for 'cave', plus the suffix *-ensis*, indicating 'from'). As a species restricted to growing on limestone substrate and being known from a single locality, it is assessed as Critically Endangered under the IUCN Categories (Rafidah, 2020).

Description of the New Species (Note: this name is presently still unpublished)

Schismatoglottis guabatuensis S. Y. Wong & P. C. Boyce sp. nov. (Fig. 1 & 2)

Type: Malaysia, Selangor, Gombak, 3° 14'51.00"N 101° 41'12.12"E, 100 m asl. 20 Mar 2020, Ong Poh Teck & Joanne Tan Pei-Chih FRI 96409 (holotype KEP).

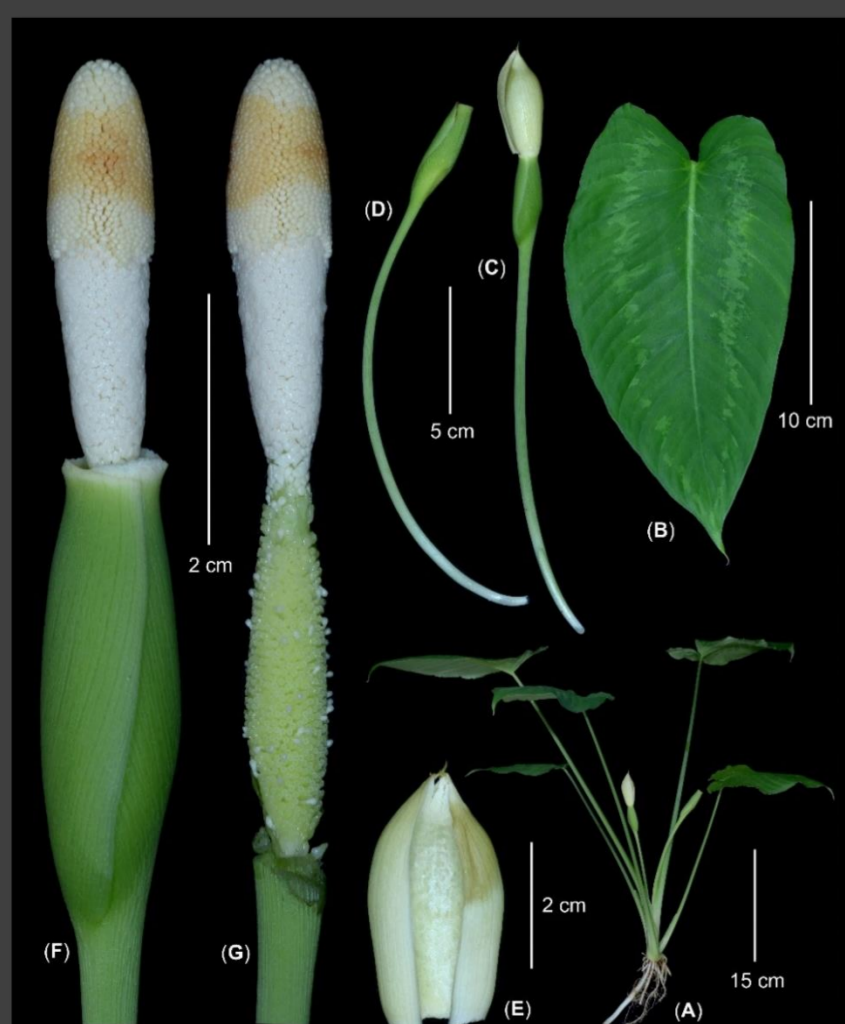


Figure 3. *Schismatoglottis guabatuensis* (A) Flowering habit. (B) Leaf blade. (C) Bloom at pistillate anthesis. (D) Infructescence. (E) Spathe limb, slightly spread out. (F) bloom at staminate anthesis, spathe limb naturally fallen. (G) Spadix at pistillate anthesis with spathe artificially removed. All from Ong Poh Teck & Tan Pei-Chih, Joanne FRI 96409. (Photo Ong P.T.).

Moderately robust colonial mesophytic herb, 30–50 cm tall. Stems hypogaeal, hapaxanthic individual arising from and producing further slender stolons, terminal active portion of stem somewhat epigeal, erect, stolons ca 10 cm long, internodes 3.5–6.5 cm long, 7–9 mm in diam. Leaves about 5 per crown; petiole, 24.3–39.3 cm long, ca 1.8 cm wide at base, tapering to 2–3.5 mm wide at apex, ventrally weakly channelled ca 1/5 of length, smooth, medium green; petiolar sheath 7–9 cm long × 5–10 mm wide, up to 3/10 of petiole length, persistent, fully attached or in exceptionally robust specimens with a very short ligule, equal at both sides, slightly in-rolled or sometimes straight, tapering; blade 14–23.5 × 5.3–10.4 cm, narrowly hastato-cordate to rather broadly ovato-cordate, margins somewhat undulate, adaxially concolorous semi-matte green or with greyish feathered markings about mid-way between mid-rib and margin, posterior lobes subtriangular, 3–4 cm, sinus narrow in broader leaf blades, wider in narrower leaf blades, up to ca 2 cm wide, apex acuminate to acute for ca 2 cm, ultimately mucronate for ca 1 cm; midrib adaxially slightly impressed with blade, often somewhat paler than surrounding tissue, raised abaxially, ca 5 mm wide at the insertion; primary lateral veins ca 20 per side, diverging at 30°–80° from midrib, adaxially impressed, raised abaxially; interprimary veins adaxially raised, alternating irregularly with primaries and sometimes arising from near the base of more robust primary veins; secondary veins 0–2 arising from each primary vein with 3–4 secondary veins raised from primary veins near to petiole insertion; tertiary veins inconspicuous. Blooms up to 3 produced in sequence, erect, esteric smelling during anthesis; peduncle 15.7–18.4 cm long × 4–9 mm wide, terete, green, erect at anthesis; spathe ca 8.5 cm long; lower spathe narrowly ovoid, ca 4.5 cm long × ca 1.5 cm wide, inserted obliquely on peduncle, green with darker longitudinal fine striations, separated from spathe limb by a constriction coinciding with sterile interstice; spathe limb oblong, ovate when flattened, ca 4.5 cm long × ca 2.3 cm wide, mucronate for ca 2 mm, very pale yellowish green at pistillate anthesis, ageing to dull white during anthesis, caducous in a single piece at onset of staminate anthesis; spadix ca 6.5 cm long, slightly shorter than spathe; pistillate floret zone slender conic, cs 2.5 cm long × ca 1 cm wide, ca 40% of spadix length, green; pistils densely arranged, sub-cylindric to sub-globose, 0.8–1.2 mm diam.; style barely differentiated; stigma globose, truncate, smaller than ovary, ca 0.3 mm diam.; interstilar staminodes rather scattered, weakly clavate, stipe slender, ca 3 mm long, slightly exceeding height of pistils, waxy white; sterile interstice cylindrical, 5 mm long × 5–6.5 mm wide, narrower than pistillate and staminate zone, partially naked, green, proximally and distally with flattened wedge-shaped staminodes; staminate flower zone weakly sub-conic, proximally narrower, 1.8–2 cm long × 8–9 mm wide, ca 30% length of spadix, white; staminate flowers densely arranged butterfly-shaped from above, ca 1.5 mm wide, each comprising 2 truncate stamens, thecae sunken, surrounded by a narrow, raised rim and separated by a raised blunt connective; appendix conical, ca 1.5 cm long × ca 1 cm wide, ca 20% length of spadix, base wider (ca 1 mm) than apex of staminate zone, there somewhat irregular, creamy yellow, the middle-zone staminodes usually noticeably darker brownish yellow; staminodes columnar, ca 2.5 mm long × ca 1.2 mm wide, somewhat laxly arranged with sunken tips. Infructescence urceolate 4–6 cm long × 2–2.2 cm wide, on a declinate peduncle; lower spathe persistent, splitting and reflexing at fruit maturity; fruits and seeds not observed.

Distribution and ecology. So far known only from the Batu Caves, a karst limestone hill, where it occurs as a colonial terrestrial mesophyte in shaded wet, soil-covered hanging valleys.

Notes. Compared with other similar species present in Peninsula Malaysia, *Schismatoglottis guabatuensis* is superficially similar *S. cordifolia* from sandstone in Ulu Perak and SW Kelantan but is different by the conical (vs fusiform) pistillate floret zone occupying about 40% (vs 55%) the length of the spadix, by the green (vs white) pistils, and shorter (3 mm long vs 5 mm long), more slender and narrower interstilar staminodes, by the green (vs white) sterile interstice bearing wedge-shaped (vs rounded) compressed staminodes, by the wider (1.5 mm vs 0.75 mm) staminate florets, and by the conical appendix 1.5 times longer than wide (vs hemispherical and about as wide as long), with rather lax (vs dense) staminodes.

Provisional conservation status. Critically Endangered.

Other specimen examined. Malaysia, Selangor, Gombak, Batu Caves, 3.2475° 101.6867°, 28 Nov 2018, Wan Mohamad Syafiq bin Wan Putra, Kiew R., Mohd. Hairul bin Mohd. Amin & Cheah, Y.H. FRI 92636 (KEP).

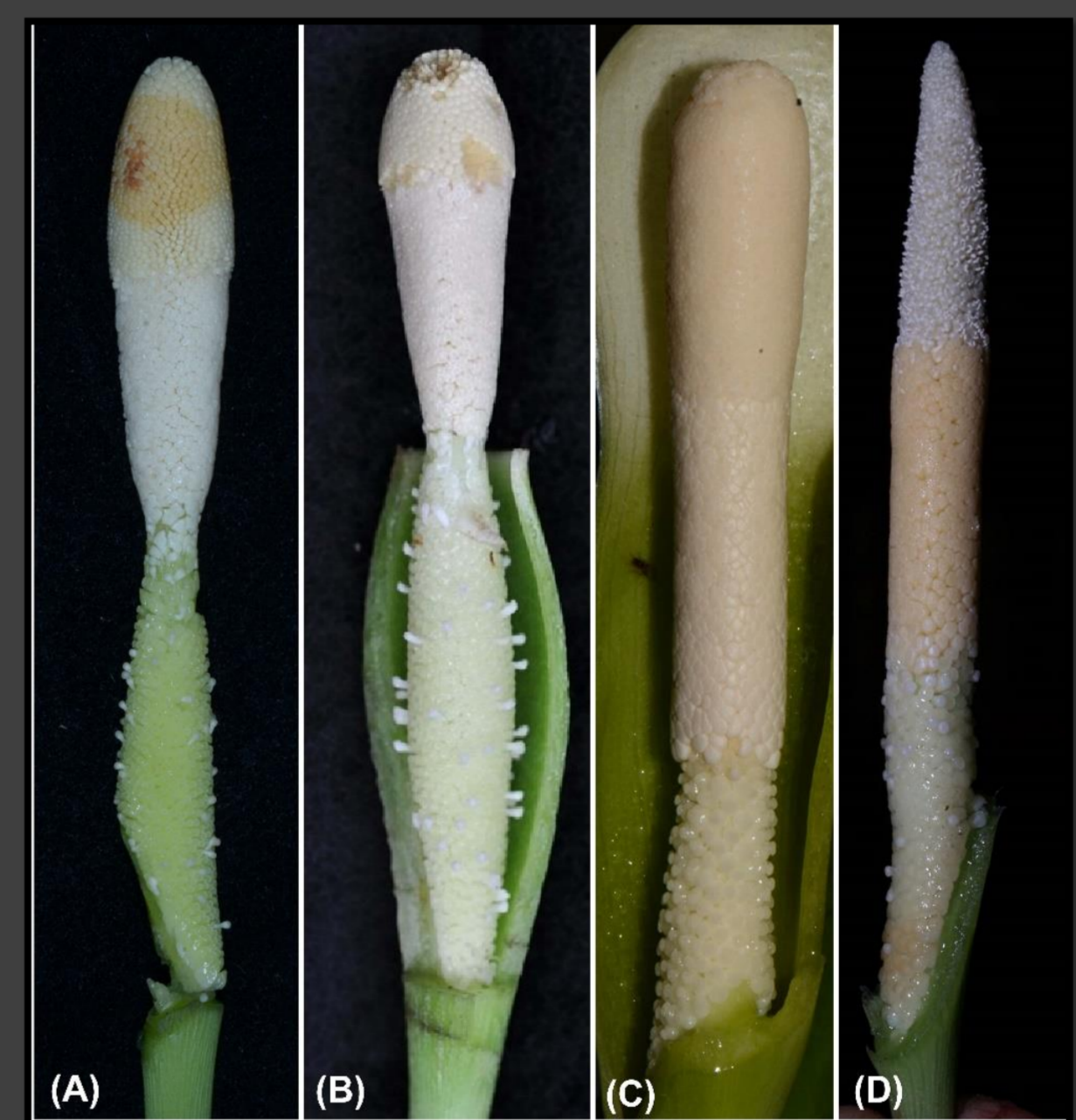


Figure 4. Spadix comparisons for the Peninsular Malaysian species of the *Schismatoglottis* Calyptrata Clade. (A) *Schismatoglottis guabatuensis*. (B) *Schismatoglottis cordifolia*. (C) *Schismatoglottis lowiae*. (D) *Schismatoglottis wallichii*. (Photo: S. Y. Wong & P. C. Boyce).

Conclusion

The discovery of an undescribed species in the heart of a major urban area is an excellent illustration of how, even after almost two centuries of botanical exploration there is still an extraordinary amount that remains to be discovered about the flora of Malaysia. This is especially so for herbaceous families such as the aroids for which there has been no *local* specialist since the time of Furtado. *Schismatoglottis* alone in the Peninsular remains about 60% undescribed, with the majority of the novelties in the same clade as *S. guabatuensis*. For *Homalomena* the percentage of novelty exceeds 80%. A recurrent aspect of many of these undescribed species is their highly localized distribution – plants are often critically threatened by land-use changes before they have even been given the benefit of a formal name.

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