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ORCID

WSY: <https://orcid.org/0000-0003-4042-9672>

PCB: <https://orcid.org/0000-0002-5856-9561>

Studies on Schismatoglottideae of Borneo LXXV — Two ornamental new species of *Schismatoglottis* from Borneo

WONG SIN YENG^{1,2,*}, JOHN-MICHEL KOENS³, PETER C. BOYCE⁴

¹ Institute of Biodiversity and Environmental Conservation, Universiti Malaysia Sarawak, 94300 Kota Samarahan, Sarawak, Malaysia

² Harvard University Herbaria, Cambridge, MA, USA

³ 160 Main Street, Westbrook, Queensland, Australia

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 ornamental new species of *Schismatoglottis* are described and illustrated from Borneo. *Schismatoglottis metallica* from Kalimantan Barat, Indonesian Borneo, assigned to the *Schismatoglottis* Multinerva clade, and *S. reticosa* from the upper Engkari river in SW Sarawak, Malaysian Borneo, provisionally placed in the Petradoxa clade. Recognition of these novelties takes *Schismatoglottis* on Borneo to 132 species, of which 86 have been described since the year 2000.

Keywords: *Schismatoglottis*, Borneo, Kalimantan, Sarawak, Indonesia, Malaysia.

INTRODUCTION

Schismatoglottis Zoll. & Moritzi was monographed for Borneo by Hay (Hay and Yuzammi 2000), recognizing 62 species, of which 31 were then new. Including the two novelties proposed here the total for Borneo now stands at 132 species, of which 86 have been described since the year 2000 (Wong et al. 2018) and with 131 endemic to the island – the sole exception being *Schismatoglottis wallichii* Hook.f., which extends to Borneo from Peninsula Malaysia. Species numbers for Borneo are inevitably set to increase as fieldwork takes in areas hitherto not investigated for Araceae given that most terrestrial aroid species have restricted distributions such that even in quite small areas it is possible to find upwards of a dozen species that occur nowhere else. It is entirely feasible that *Schismatoglottis* on Borneo alone will surpass 250 species.

Clades cited are as per Low et al. (2018). Geology is specified based on Hutchison (1989, 2005) and Tate (2001).

Schismatoglottis metallica S.Y.Wong, Koens & P.C.Boyce, **sp. nov.**

Type: Cultivated by John-Michael Koens, Westbrook, Qld, 26 Nov 2021, sub. AR-4083 (original collection: Indonesian Borneo, Kalimantan Barat, Sekadau, Nanga Taman, south of Nanga Taman, 14 Dec 2010, *Kazuya Nakamoto s.n.*) (holotype BO! + spirit; isotype SAR! + spirit). (Figures 1, 2 and 3A).

Diagnosis

Schismatoglottis metallica is overall most similar to *S. hayi*, *S. multinervia*, and *S. porpax* by the densely and minutely puberulent petioles. *S. metallica* differs from the first two by its spathe limb scarcely opening or altering in appearance during anthesis (vs spathe limb spreading and reflexing, and at the same time the spathe limb interior darkening and becoming very glossy), and from *S. porpax* by the spadix with a dense zone of staminodes at the top of the pistillate zone and lacking an elongated interstice separating the pistillate and staminate zones. The spadix of *S. metallica* is reminiscent of those of *S. meriraiensis* and *S. puberulipes*, from both of which it is distinct by its spathe limb scarcely opening (vs opening wide), and further from *S. meriraiensis* by its puberulent (vs smooth) petioles, and from *S. puberulipes* by its erect leaves (vs leaves forming a rosette appressed to the ground).

Description

Small herb to ca. 20 cm tall with vegetative tissues faintly aromatic (terpenoids). Stem initially condensed, epigeal, maroon, in older plants stems somewhat elongating, erect-ascending and rooting from the nodes, ca. 10 mm diam., active portions obscured by petiole bases. Leaves up to ca. 20 together forming a compact clump; petiole 5–19 cm long, rather stout, pale to rather deep maroon, densely and minutely puberulent with short straight colourless hairs, longitudinally ridged, the angles narrowly crisped-alate, sheathing in lower 1/3–2/5 (sometimes sheathing for entire length in leaf below a bloom); wings of sheath fully attached, thickly membranous, persistent, spreading, abaxially puberulent, bluntly ligulate; blade oblong-ovate, 8–13 cm long, 4–6.7 cm wide, erect to spreading, glossy metallic dark bronze-maroon adaxially, matte pale maroon abaxially, margins somewhat undulate, base briefly but distinctly cordate with rounded posterior lobes 1–2 cm long, tip acute to obtuse, with a short terminal tubule, attached blades and detached whole or partial blades spontaneously producing adventitious plantlets on the abaxial surfaces along the main veins; midrib abaxially prominent, pubescent

as for petiole; primary lateral veins 11–16 on each side of mid-rib, alternating with lesser interprimaries, diverging at the angle of 70°–90°(–100°) then rather sharply acropetally deflected before reaching margin, adaxially somewhat prominent near midrib, abaxially puberulent near midrib, adaxially impressed, especially in the proximal half; secondary venation arising from both midrib and bases of primary veins; tertiary venation abaxially forming a tessellate reticulum, all venation abaxially slightly to notably darker than the surrounding tissue. Blooms 3–5 in sequence, the synflorescence subtended by a cataphyll usually with reduced but well differentiated petiole and blade; peduncle short, largely hidden within leaf bases, bright maroon, puberulent as for petioles. Spathe ca. 4 cm long, exterior semi-glossy; lower spathe ovoid, ca. 1.5 cm long, differentiated from limb by a distinct constriction, intense maroon-green with darker longitudinal striae; spathe limb broadly ovate, tip apiculate, pale pink with branching/broken maroon striations, inflated and opening by the lower half slightly gaping at onset of pistillate anthesis, then splitting slightly above the constriction, with the damaged edges darkening before the limb falls. Spadix ca. 3 cm long, sessile and inserted obliquely onto lower spathe/peduncle, pistillate zone conic, medium green; pistillate florets crowded, sub-globose, ca. 1 mm diam.; stigma button-like, papillate, about half diameter of ovary, darkening at anthesis and producing a droplet; sub-pistillar staminodes confined to a single row around base of pistillate zone, depressed-globose, attached at narrower end, ca. 1 mm wide, waxy dull creamy-white; sterile interstice ca. 5 mm long, slightly thicker than top of pistillate zone and sharply contracting into staminate zone, completely covered with irregularly polygonal staminodes, these ca. 1 mm long, 0.3–1 mm wide at top, waxy white; staminate floret zone obconoid, ca. 1 cm long, basally ca. 2 mm diam., apically ca. 4 mm diam., cream; stamens very crowded, ca. 0.5 mm diam., more or less dumb-bell-shaped, truncate, with at least some stamens with a wide paler connective; appendix rather broadly ellipsoid, ca. 1 cm long, ca. 4 mm wide, composed of irregularly polygonal more or less flat-topped staminodes ca. 0.4 mm diam. Fruiting spathe narrowly urceolate, ca. 1.5 cm diam., medium green. Fruits and seeds not observed.

Etymology

From Latin, *metallicus*, metallic, coined to draw attention to the metallic lustre of the mature foliage.

Distribution

Known with certainty only from the type locality.



Figure 1. *Schismatoglottis metallica* (A) Plants in habitat. (B) Leaf blade, abaxial surface. All from Kazuya Nakamoto s.n.



Figure 2. *Schismatoglottis metallica* (A) Flowering habit; note the succession of developing blooms. (B) Bloom at pistillate anthesis. (C) Bloom at pistillate anthesis, nearside spathe artificially removed. (D). Bloom at onset of staminate anthesis, spathe limb beginning to shed. All from AR-4083.

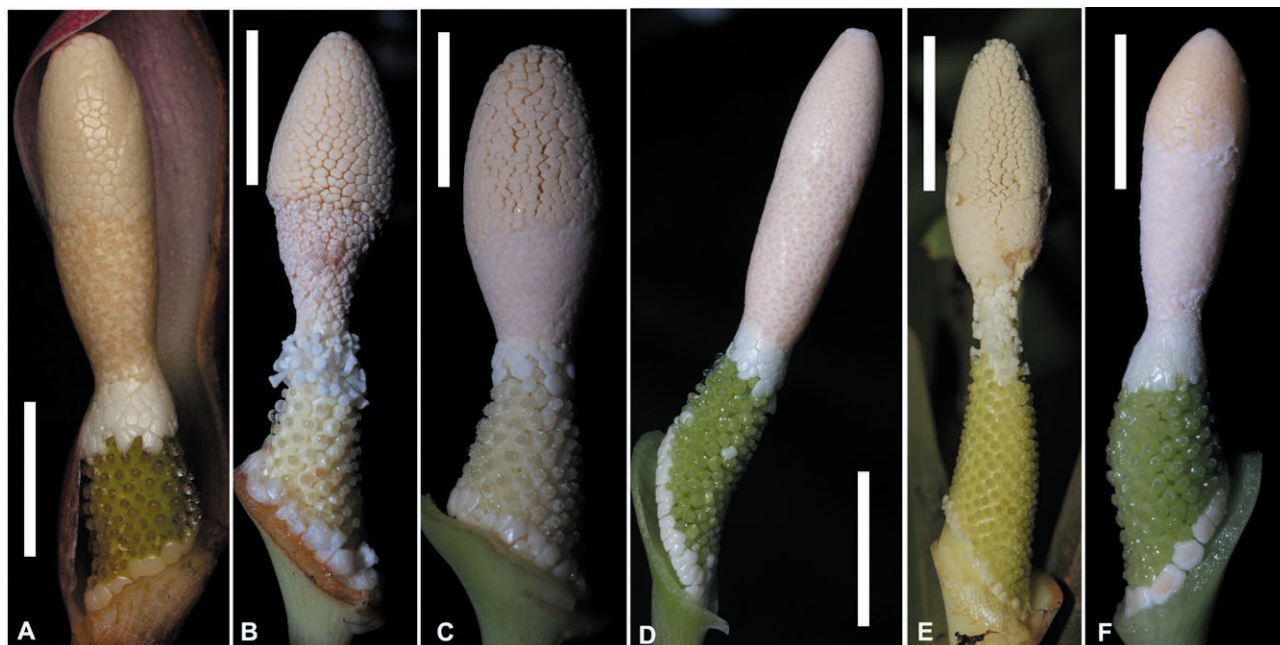


Figure 3. Spadix of species of the *Schismatoglottis* Multinervia Clade compared. (A) *Schismatoglottis metallica* [AR-4083]. (B) *Schismatoglottis hayi* [AR-1879]. (C) *Schismatoglottis multinervia* [AR-1932]. (D) *Schismatoglottis meriraiensis* [AR-1281]. (E) *Schismatoglottis porpax* [AR-4684]. (F) *Schismatoglottis puberulipes* [AR-1062]. Scale bar = 1 cm.

Ecology

Occurring terrestrially at about 400 m asl. in deep leaf litter deposits in damp shady humid lowland forest on lower Cretaceous granites.

Notes

The *Schismatoglottis* Multinervia Clade comprises species with pleioanthic shoots, crushed vegetative tissues smelling of terpenoids, petioles and abaxial major veins often pubescent, leaf blades with scalariform higher order veins, and a largely hourglass-shaped spadix with 1–2 rows of large staminodes in at the junction of the pistillate zone with the spathe. Some species have viviparous leaf blades, producing plantlets from portions of damaged leaves or from the distal-most portion of the mid-rib on the leaf blade undersurface. Recognition of *Schismatoglottis metallica* takes the clade to five described species: *S. hayi* S.Y.Wong & P.C.Boyce (Figure 3B – Wong & Boyce 2011), *S. multinervia* M.Hotta (Figure 3C – Hotta 1966), *S. meriraiensis* P.C.Boyce & S.Y.Wong (Figure 3D – Boyce & Wong 2015), *S. porpax* S.Y.Wong, Kartini & P.C.Boyce (Figure 3E – Wong et al. 2019) and *S. puberulipes* Alderw. (Figure 3F – Alderw. 1922).

Schismatoglottis metallica is additionally one of the most attractive non-variegated *Schismatoglottis* species

so far discovered, with the contrast between the metallic-lustred bronze upper surface and matte magenta lower surface of the leaf blades particularly striking.

Propagation is readily affected from the adventitious plantlets that spontaneously arise from the major veins on the undersurface of older leaf blades, or even from detached portions of the blade, a trait shared with the related *Schismatoglottis meriraiensis* and *S. puberulipes*.

Schismatoglottis reticosa S.Y.Wong, Koens & P.C.Boyce, sp. nov.

Type: Malaysia. Sarawak, Sri Aman, Lubok Antu, Nanga Segerak, Ulu Sungai Engkari, Lanjak Entimau W.S., Sungai Segerak, 1°24'21.9"N 112°00'14.6"E, 400 m asl, 16 Mar 2015, Wong Sin Yeng, P.C.Boyce & Bada ak Chendai AR-5138 (holotype SAR!, + spirit; isotype SAR!, + spirit). (Figures 4 and 5).

Diagnosis

Schismatoglottis reticosa is unique in the genus by the combination (in adult plants) of leaves in distichous fans with leaf blades adaxially with very prominent raised-tessellate venation formed by the parallel primary and interprimary venation and scalariform secondary veins.



Figure 4. *Schimatoglottis reticosa* (A) Plants in habitat. (B) Leaf blade adaxial surface. (C) Leaf blade abaxial surface. All from AR-5138.

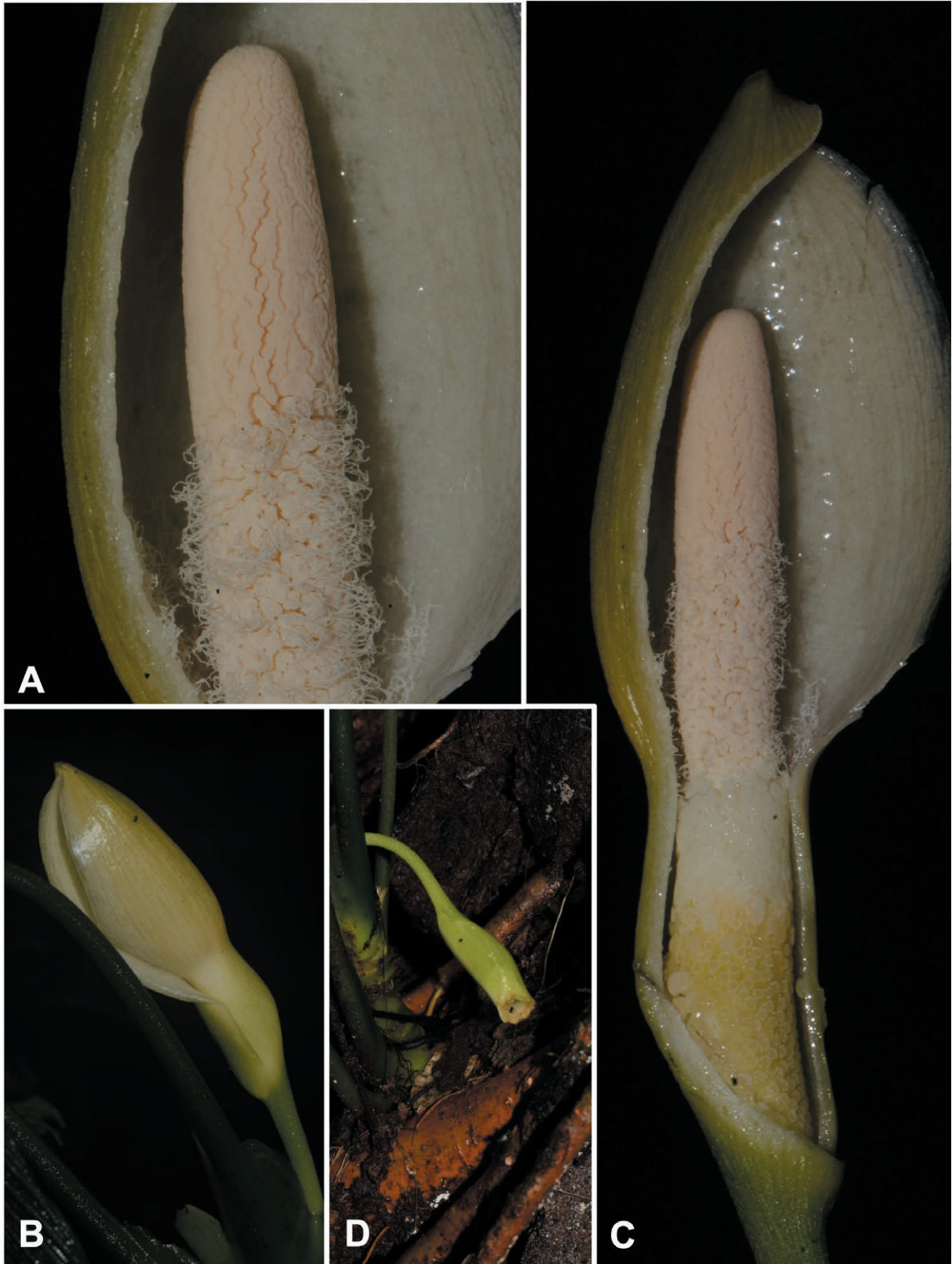


Figure 5. *Schismatoglottis reticosa* (A) Detail of staminate zone and appendix, staminate anthesis. (B) Bloom at pistillate anthesis. (C) Bloom at staminate anthesis, nearside spathe artificially removed. (D). Fruiting spathe. All from AR-5138.

Description

Lithophytic herbs to ca. 20 cm. Stem much-condensed, slightly creeping-erect in older plants, with internodes to 1 cm long, 1 cm diam., densely rooting at the base. Leaves spiro-distichous in juvenile plants, strictly distichous in adult plants with the blades held flat or somewhat pendent, foliage leaves alternating with brittle, soon-marcescent then deliquescent, slender tapering lanceolate weakly scabrid cataphylls each up to 4 cm long; petiole shorter than blade, arching to almost straight, 8–25 cm long, subterete, semi-glossy dark green, minutely scabrid, sheathing only at very base, with the petiolar sheath reduced to an obscure ridge; blade oblong-elliptic, 12–20 cm long × 5–8 cm wide, rather thick and stiffly brittle, adaxially semi-glossy deep green, much paler and matte abaxially, base cuneate to narrowly rounded, apex acuminate and apiculate for ca. 1 cm; midrib adaxially more or less flush with blade and contrasting cream, especially visible on newer leaves, abaxially prominent; primary lateral veins ca. 20 on each side, diverging at 45–60°, conspicuously raised on both surfaces; secondary venation abaxially visible as a semi-translucent tessellate reticulum, abaxially forming a prominent raised reticulum by the scalariform secondaries between the parallel primary and interprimaries; tertiary venation invisible. Bloom nodding to pendulous, solitary, with a slight esteric odour at pistillate anthesis, subtended by brittle lanceolate cataphylls, peduncle cylindrical. Spathe with a moderate constriction between the lower part and the limb, 5–6.5 cm long; lower spathe narrowly ovoid and asymmetric, dorsally shallowly flattened-convex corresponding to the adnation of the pistillate floret zone, pale green with very fine paler longitudinal veins, dorsally ca. 1.5 cm long, ventrally ca. 2 cm long, persistent; spathe limb inflating and slightly gaping at pistillate anthesis, opening further at staminate anthesis with the upper half opening at pistillate anthesis, initially via a narrow terminal slit, then wide-gaping (ca. 2 cm wide), and weakly fornicate, with the interior becoming rather slimy, then whole limb degrading-caducous with the rim remaining above the lower spathe insertion reflexing somewhat, exterior yellowish white with very fine darker longitudinal lines, apex somewhat green-tinged, interior dirty whitish green, broadly lanceolate 4.5–5.5 cm long, bluntly rostrate for ca. 3 mm. Spadix 4.5 cm long, elongated conic cylindrical; pistillate zone 1.5 cm (dorsal side) to 2 cm long (ventral side), weakly conic, obliquely inserted, distally ca. 6 mm diam., dull yellow; pistillate florets small, crowded, ca. 1 mm diam., barrel-shaped, dull yellow; stigma sessile, discoid, slightly narrower than top of pistil, ca. 1.5 mm tall × 0.8 mm wide, papillose; infrapistillar pistillodes forming an

interrupted row at junction with peduncle, ca. 1.2 mm long, slimmer than pistils, slender-cylindric whitish green; sterile interstice with about 5 spirals of staminodes; interstice staminodes weakly columnar-polygonal ca. 1 mm across, white, initially equalling the height of pistils; staminate zone cylindrical, ca. 1.5 cm long × 0.4–0.5 cm diam., cream; stamens irregularly densely crowded and individual florets difficult to distinguish, rectangular dumbbell shaped from above, truncate with thick connective slightly elevated above thecae, thecae opening by a single pore; pollen released in copious fine strings; appendix narrowly fusiform, blunt, proximally slightly wider than top of staminate zone, 1.5–2 cm long, widest part ca. 8 mm diam., distally tapering and narrowly obtuse, white; appendix staminodes irregularly polygonal, ca. 0.5 mm wide, forming sinuous longitudinal groups. Fruiting spathe very narrowly cylindrical-urceolate, pendulous; fruit and seed not observed.

Etymology

From the Latin noun, *rete*, *retis* – a net, reflecting the diagnostic raised venation of the adaxial surface of the leaf blade.

Distribution

So far known only from the upper reaches of the Engkari river where it is uncommon.

Ecology

Occurring between 350 and 400 m asl. under very humid gallery forest on steep shaded slopes of Cretaceous shales above small rivers.

Notes

Although yet to be analysed with molecular data *Schismatoglottis reticosa* most likely belongs in the *Petradoxa* clade (Wong & Boyce 2014; Low et al. 2018) in which the distichous leaf blade arrangement, tessellate higher-order venation, scabrid petioles with the petiolar sheath reduced to a thickened ridge, marcescent-deliquescent prophylls, nodding blooms, thecae with a single pore, pollen in long strings, and pendulous fruiting structures all accord.

Additional specimens examined (paratypes)

MALAYSIA. Sarawak, Sri Aman, Lubok Antu, Nanga Segerak, Ulu Sungai Engkari, Lanjak Entimau W.S., Sungai Serjanggung, 1°24'41.7"N 112°00'24.9"E, 380 m asl., 17 Mar 2015, Wong Sin Yeng, P.C.Boyce & Bada ak Chendai AR-5160 (SAR).

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