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Two new species of *Ooia* (Araceae) from Sabah, Malaysian Borneo

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Abstract. Two new species of *Ooia* (Araceae) from Sabah, Malaysia, *Ooia sayapensis* Kartini and *Ooia ulusenagangensis* Kartini are described as new species. Both are distinguished from the only current Sabahan species, *Ooia kinabaluensis* (Bogner) S.Y. Wong & P.C. Boyce by the presence of pistillodes at the pistillate flower zone.

Keywords: Araceae, *Ooia*, Sabah, Malaysia Borneo, rheophytes.

INTRODUCTION

Wong and Boyce (2010) defined *Ooia* by the spadix axis remaining fresh through to fruit maturation and the spent flowers shedding at the post-anthesis. The group is monophyletic (Boyce and Wong 2016), accepting 10 species with the *Ooia kinabaluensis* (Bogner) S.Y. Wong & P.C. Boyce is the only species recorded from Sabah and Brunei.

The spathes of the genus *Ooia* S.Y. Wong & P.C. Boyce are remarkably similar in external appearance. However, the spadix at anthesis is critically crucial as the diagnostic characteristics in this genus (Wong and Boyce 2010). Thus, the present presence of about 5-9 spirals of pistillodes at the base of the pistillate flower zone in the two species of Sabahan's *Ooia* to be described here apparently represents an undescribed taxonomic novelty compared to the very few pistillodes in *O. kinabaluensis*.

Recognition of these two species, namely *O. sayapensis* and *O. ulusenagangensis* will take *Ooia* to three species in Sabah and 12 species on Borneo.

***Ooia sayapensis* Kartini, sp. nov.** (Figure 1).

Type: Malaysia, Sabah, Sayap, Kinabalu UNESCO Global Geopark, 6°09.775'N 116°33.935'E at 938 m asl, 14 April 2019, *Kartini BORH 2710* (holotype BORH!)

Diagnosis

Ooia sayapensis are differentiated from *O. kinabaluensis* by having pistilloides with about 5-9 spirals almost equalling 1/4 of the spadix length,

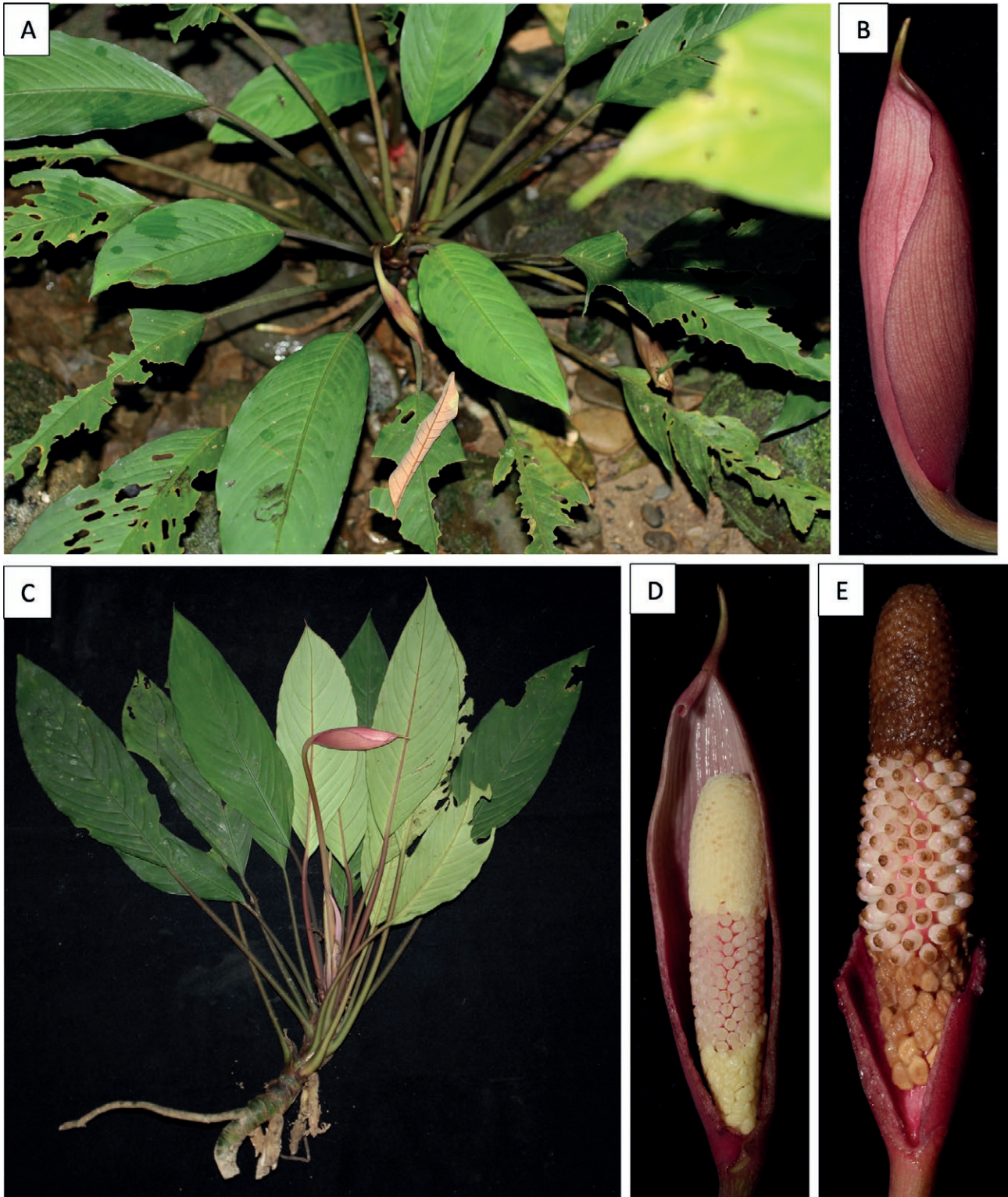


Figure 1. *Ooia sayapensis* – A: flowering plant in habitat; B: Inflorescence; C: whole plant; D: inflorescence at onset of pistillate anthesis (spathe artificially removed); E: inflorescence at later stage of anthesis – All from Kartini BORH 2710 – All photographs by Kartini Saibeh.

and by the pink pistil (versus very few pistilloides and white pistil). Inflorescences smelling of isoamyl acetate (fruity pear odour) at pistillate anthesis is a characteristic shared with *O. kinabaluensis*.

Description

Medium-sized rheophytic herb c. 10–30 cm tall. Stem rather elongated sometimes branched rhizomes, c. 15–20 cm long, internodes to c. 1.5 cm long, c. 1.5–2 cm diam., greenish brown to reddish brown; rooting along length, strongly adhesive, c. 3–5 mm thick. Leaves up to 15 together, loosely clustered at shoot tips and also distributed along stem; petiole 8–15 cm long, c. 3 mm diam., sheathing at the extreme base, the wings extended into a triangular somewhat marcescent ligular portion up to c. 1–1.5 cm; blade weakly coriaceous, elliptic to ovate, c. 10–18 cm long × c. 4–6 cm wide, base cuneate, apex acute to shortly acuminate c. 2 mm, blades dark green adaxially, abaxially light green; midrib robust, adaxially less prominent, abaxially prominent; primary lateral veins 8 on each side, alternating with interprimaries, diverging at 30–40°, often somewhat reddish brown; secondary venation fine, adaxially more or less obscure; tertiary venation adaxially obscure, abaxially forming a faint tessellate reticulum. Inflorescence solitary with prophylls, with up to four produced in sequence each interspersed by a foliage leaf; fragrance weakly isoamyl acetate; peduncle erect, exceeding petioles, c. 16 cm long, slender, pale green to reddish brown. Spathe subcylindric, c. 3 cm long, reddish, persistent, apiculate for c. 2–4 mm, nodding on an erect peduncle at anthesis. Spadix c. 2.5 cm long, stoutly cylindrical, sessile, obliquely adnate to the spathe at the base; pistillodes present, confined to a robust zone below the female zone of up to 5–9 oblique spirals, slightly exceeding height of pistils, irregularly polygonal flat-topped, milky white, c. 1.1 mm diam.; pistillate flower zone slightly obconic, c. 1 cm long, c. 8 mm diam., pinkish; pistils laxly arranged, c. 1 mm high, c. 0.8 mm diam.; stigma sessile, discoid, pale orange; interstice absent; staminate flower zone c. 1.2 cm long, bullet-shaped, apically obtuse; stamens minutely pubescent. Fruits completely contained within the persistent spathe; berry sub-cylinder c. 2 mm height, c. 1 mm diam., flat stigmatic remnant on top, greenish.

Etymology

From Sayap + *ensis*, a suffix denoting the place of origin.

Distribution

Recorded only from Sayap substation, located at the north of the Kinabalu UNESCO Global Geopark in Kota Belud.

Ecology

Rheophytic on shaded Quaternary sandstones, riverine boulders under wet upper hill forest between 900–1100 m above sea level.

Notes

Ooia sayapensis occurs consistently on shaded water-splashed boulders. This medium size rheophytic herb have elongated sometimes branched rhizome-like stem and rooting along its length.

Ooia ulusenagangensis Kartini, *sp. nov.* (Figure 2).

Type: Malaysia, Sabah, Ulu Senagang, Crocker Range National Park, 5°22.00'N 116°01.656'E, 539 m asl, 17 April 2019, *Kartini BORH 2711* (holotype BORH!).

Diagnosis

The presence of several rows of pistilloides at the base of pistillate flowers zone is a characteristic shared with *O. sayapensis*. *Ooia ulusenagangensis* has a densely arranged glassy white pistil, which is differentiated from *O. sayapensis* (laxly arranged pink pistil) and *O. kinabaluensis* (laxly arranged white pistil), as shown in Figure 3. The inflorescences smelling of isoamyl acetate at pistillate anthesis is very weak in *O. ulusenagangensis* compared to the strong smell in *O. kinabaluensis*.

Description

Medium-sized rheophytic herb 10–30 cm tall. Stem condensed, c. 5 cm long, c. 1.5 cm diam., greenish; roots strongly adhesive, 3–5 mm thick. Leaves up to 15 together; petiole 9–11 cm long, c. 3 mm diam., sheathing at the extreme base, the wings extended into a triangular somewhat persistent ligular portion up to 1/3 of the petiole length; blade weakly coriaceous, lanceolate to oblong lanceolate, c. 13 cm long × c. 4 cm wide, base cuneate, apex acute, sometimes acuminate c. 3 mm, blades light green adaxially, abaxially paler; midrib robust, abaxially prominent; primary lateral veins 8–12 on each side, alternating with interprimaries, diverging at 30°–40°, often somewhat reddish brown; secondary venation fine, adaxially more or less obscure; tertiary venation adaxially obscure, abaxially obscure or forming a very faint tessellate reticulum (most easily seen in dry material). Inflorescences solitary with prophylls; no detectable distinct fragrance or very weak fruity odour, peduncle erect, exceeding petioles, c. 16 cm long, slender, pale green to reddish brown. Spathe subcylindric, c. 4 cm long, reddish, persistent, apiculate for c. 7 mm; nodding on an erect peduncle at



Figure 2. *Ooia ulusenagangensis* – A: flowering plant in habitat; B: Inflorescence; C: inflorescence at onset of pistillate anthesis (spathe artificially removed); D: whole plant; E: inflorescence at later stage of anthesis – All from Kartini BORH 2711. – All photographs by Kartini Saibeh.



Figure 3. Spadices of *Ooia* compared – A: *O. sayapensis* Kartini; B: *O. ulusenagangensis* Kartini; C: *O. kinabaluensis* (Bogner) S.Y. Wong & P.C. Boyce – All photographs by Kartini Saibeh.

anthesis. Spadix c. 2.5 cm long, stoutly cylindrical, sessile, obliquely adnate to the spathe at the base; pistillodes present, confined to a robust zone below the female zone of up to 5-9 oblique spirals, slightly exceeding height of pistils, irregularly polygonal flat-topped, milky white, c. 1 mm diam.; pistillate flower zone slightly obconic, 6–8 mm long, c. 5 mm diam., glassy white; pistils densely arranged, c. 1 mm high, c. 1 mm diam.; stigma sessile, discoid; interstice absent; staminate flower zone c. 1 cm long, bullet-shaped, apically obtuse; stamens minutely pubescent. Fruits completely contained within the persistent spathe; berry sub-cylinder c. 2 mm height, c. 1 mm diam., flat stigmatic remnant on top, creamy.

Etymology

From Ulu Senagang + *ensis*, a suffix denoting the place of origin.

Distribution

Recorded only from Ulu Senagang substation, located at the western end of the Crocker Range National Park in Keningau.

Ecology

Rheophytic on exposed Oligocene sandstone, riverine boulders between 400-600 m asl. The surrounding vegetation consists of disturbed hill dipterocarp forest.

Notes

Ooia ulusenagangensis occurs on exposed bare rocks along river of open canopy forest and is frequently exposed to dry conditions at times of low water. A somewhat persistent petiolar ligular about 3 cm long was observed and easily seen in the living collection.

Key to the species of *Ooia* of Sabahan species

- 1a. Pistillodes absent or very few at the base of spadix.....
.....*O. kinabaluensis*
- 1b. Pistillodes present in several spirals at the base of spadix....
..... 2
- 2a. Pistils lax, pinkish; Sayap, Kota Belud..... *O. sayapensis*
- 2b. Pistil dense, glassy white; Ulu Senagang, Keningau
..... *O. ulusenagangensis*

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