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Research

A new *Cryptocoryne* species (Araceae) from the Schwaner mountains, West Kalimantan, Indonesia

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A new species, *Cryptocoryne tirtadinatae*, from the Schwaner mountains West Kalimantan, Indonesia is described and illustrated. It differs significantly from all other *Cryptocoryne* species by the short leathery leaves, with the leaf blades shining green–purple pinkish with green markings on the upper surface, and the short spathe with a reddish limb and red spotted tube opening. The chromosome number $2n = 24$, is the first report of this number for the genus.

Keywords: Araceae, Borneo, chromosome number, *Cryptocoryne*, Indonesia, Kalimantan, new species, Schwaner mountains

Introduction

It is now 100 years ago since Engler's completion of the study of the Araceae in 'Das Pflanzenreich' with the volume including the genus *Cryptocoryne* (Engler 1920), a genus in which he described 13 species from 1879 to 1920, of which nine were from the island of Borneo. Since then, the *Cryptocoryne* of Borneo have been revised a number of times, e.g. by de Wit (1971, 1990), Schulze (1971), Rataj (1975), Arends et al. (1982), Jacobsen (1985), Ipor et al. (2009) and Bastmeijer (2020).

A recent study of the *Cryptocoryne* from West and Central Kalimantan (Wongso et al. 2017) described five new species and a new variety from the Schwaner mountains (W Kalimantan) and the Müller mountains (W and C Kalimantan), increasing the total number of accepted *Cryptocoryne* taxa for Borneo to 30, i.e. 24 species, with four varieties and two interspecific hybrids. This study also reported new chromosome numbers within the genus *Cryptocoryne*. The data provided an extended dysploid, step-wise descending series of (basic) chromosome numbers with $2n = 36, 34, 30, 28, 26, 22, 20, 14$ and 10.

In March 2019 a local hunter reported an unidentified *Cryptocoryne* from the Schwaner mountain range. Photos and specimens showed characteristics different from all known *Cryptocoryne* species (Wongso et al. 2017, Bastmeijer 2020). The locality in the Schwaner mountains was visited by Hendrik in August 2019 (Fig. 1), about 100 km north east from Ketapang, West Kalimantan and samples were obtained. An investigation of its chromosome number showed $2n = 24$, an additional new





Figure 1. *Cryptocoryne tirtadinatae* – habitat at type locality. (A) stand on river bank below high water line, (B) the dense carpet of emergent plants – Photographed 19 August 2019.

chromosome number in *Cryptocoryne*. Below, this previously unknown species is formally described.

Biota Conservation Foundation (Yayasan Konservasi Biota Lahan Basah) and the Indonesia *Cryptocoryne* Community (Komunitas *Cryptocoryne* Indonesia).

Material and methods

Samples were cultivated in Surabaya and Copenhagen for investigation. Chromosome slides were prepared according to the protocol provided by Wongso et al. (2017).

Results

Cryptocoryne tirtadinatae Wongso, sp. nov. (Fig. 1–3)

Type: Indonesia, West Kalimantan, Ketapang Regency, Schwaner mountain area, about 100 km north east from Ketapang, 19 Aug 2019, *Hendrik HY156* (= *SW 1915*) (holotype BO, isotype C).

Eponymy

The species is dedicated to Mr. Nichoolas Tirtadinata, who is a long-time *Cryptocoryne* enthusiast and co-founder of Wetland

Description

Amphibious herb with subterranean stolons and rather long vertical rhizomes in wild plants. Leaves 8–12, somewhat coriaceous, 5–8 cm long; lamina 3–5 × 1–2 cm, ovate with a distinctly cordate base and somewhat undulate margins, shining green–purple pinkish with dark green markings on the upper surface, light green on the lower surface, spreading more or less upright, submerged or emergent. Cataphylls usually present, two-keeled, ca 1.5 cm long, whitish or greenish. Spathe 2.5–3 cm long, outside whitish at the base, upwards dull green; peduncle 1–2 cm long; kettle about 1 cm long, inside white, with flap light yellowish; tube ca 0.5 cm long, opening by a small ridge on one side; limb ca 1.5 cm long and ca 0.5 broad, narrowly ovate, with smooth surface, upright, forward twisting, reddish at the base becoming yellowish upwards, and with a broad red-spotted tube opening and collar zone. Spadix ca 1 cm long, with 5–6 white female flowers with



Figure 2. *Cryptocoryne tirtadinatae* sp. nov. (A) close up of stand with two flowering specimens, (B) extracted plant showing the leaf blades with the shining green–purple hue with green markings, (C) plant seen from the side with the vertical rhizome and branched roots. Photographed 19 August 2019.

broadly ellipsoid to emarginate stigmas; olfactory bodies light yellow; male flowers 25–35, yellow; appendix white. Syncarp ovoid, smooth. Seeds not observed. Chromosome number: $2n = 24$, reported here for SW 1915.

Distribution and ecology

Cryptocoryne tirtadinatae is endemic to Indonesia, W Kalimantan, Ketapang Regency, Schwaner mountain range, at present only known from a single locality. Here it grows on mixed mineral soil and plant debris between tree roots on the banks of a small, 10–15 m wide, river with seeping water from the adjacent forest floors (Fig. 1). It was found emergent on the riverbank below the high-water mark, while *C. striolata* Engl. occupied deeper parts of the river. The habitat is influenced by water level fluctuations during the dry and wet seasons.

Conservation status

As *Cryptocoryne tirtadinatae* is known only from one locality, it is difficult to ascertain the conservation status according to IUCN (2019) categories and criteria, except that it is Data Deficient. More observations are needed in order to make a conservation assessment. Future forest cutting in the

catchment area could result in a washout of the riverbed, and collecting for commercial purpose is a risk.

Cultivation

Cryptocoryne tirtadinatae has only recently come into cultivation, so information is scarce, but it seems to thrive well as emergent in a leaf peat soil or on mulched bamboo leaves.

Similar species

Cryptocoryne tirtadinatae differs from all other known species of the genus by the short spathe, a limb of equal length to the kettle and tube, an upright limb, obliquely forward twisted with a smooth surface, reddish at the base becoming yellowish upwards, and a broad red-spotted collar zone. The coriaceous foliage is shining green–purple–pinkish with green markings on the upper leaf surface.

A key to the *Cryptocoryne* species of Borneo was provided by Wongso et al. (2017). The new species keys out in a restructured lead 29:

- 29a. Limb brown, spotted or reddish at the base becoming yellowish upwards with a broad red-spotted tube opening and collar zone.....30
 - Limb light to dark purple.....new 31 (old 30)

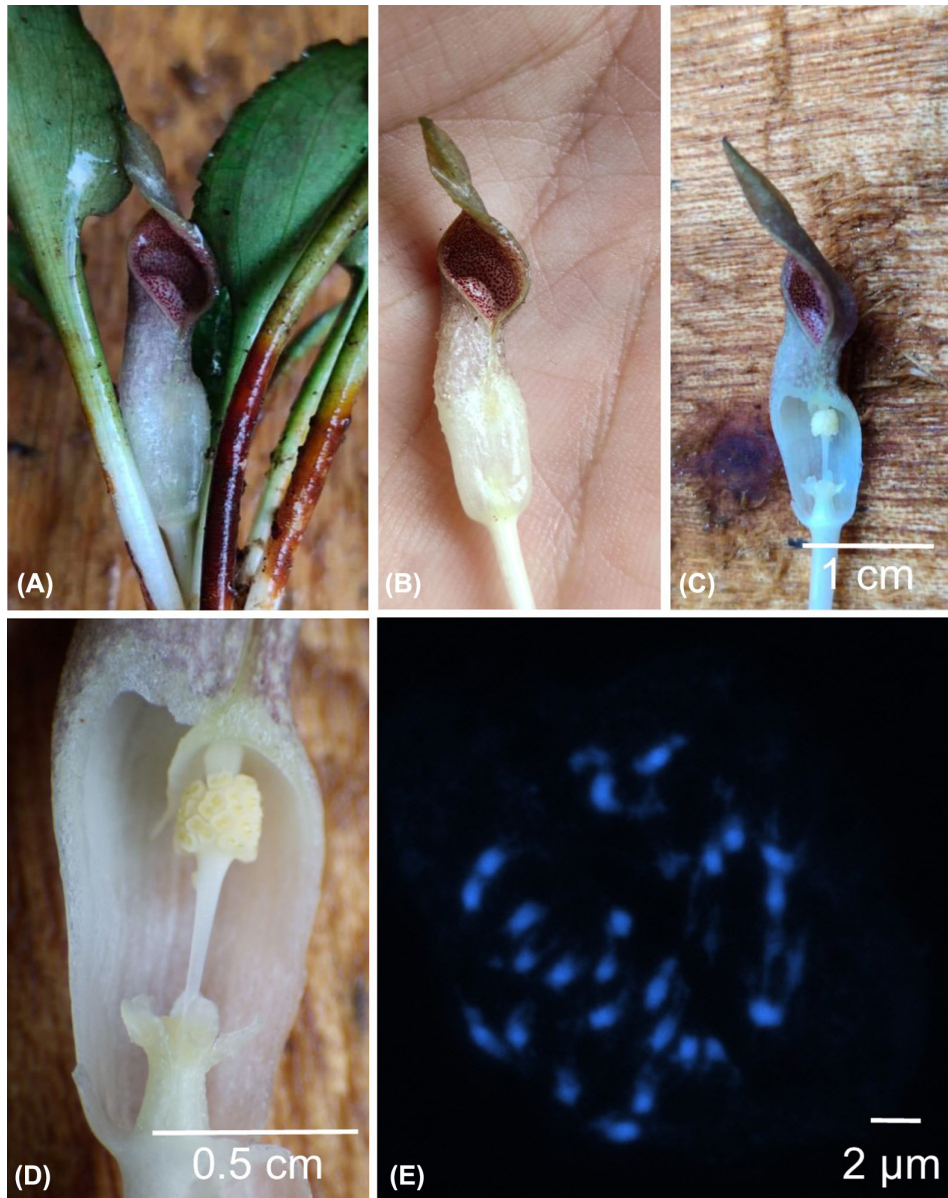


Figure 3. *Cryptocoryne tirtadinatae* sp. nov. from type collection. (A) spathe attached to plant, (B) cut off with the characteristic purplish spathe limb, the red spotted collar zone and showing the red spotted ridge to the left in the opening, (C) with the kettle cut open, the female flowers at the base of the spadix and the male flowers in the distal part, (D) close up of the cut open kettle with the female flowers with ovate to emarginate stigmas, the light yellow olfactory bodies, the naked interstice, the male flowers and the white sterile appendix, (E) chromosomes showing $2n = 24$.

- 30a. Limb surface rough, brown, spotted, tube opening \pm hidden.....*C. noritoui*
 – Limb surface smooth. reddish at the base becoming yellowish upwards, tube opening broad, spotted red.....*C. tirtadinatae*

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