

Cryptocoryne hybrids (Araceae) 4: A *Cryptocoryne* hybrid from the Meratus mountains, South Kalimantan, Indonesia.

Suwidji Wongso¹, Jan D. Bastmeijer², Takashige Idei³, Karen Rysbjerg Jensen⁴,
Marian Ørgaard⁴ & Niels Jacobsen⁴

¹) Komunitas *Cryptocoryne* Indonesia, Raya Sawo Gg. III/33, Surabaya 60218,
Indonesia. suwidji@anglerlab.co.id

²) Oude Roswinkelerweg 72, NL-7822 AG Emmen, The Netherlands.
crypts@xs4all.nl

³) 23-14, 1 Chome Amanogahara, Katano City, Osaka 576-0034, Japan.
telkomjp@yahoo.co.jp

⁴) Section of Organismal Biology, Department of Plant and Environmental Sciences,
Faculty of Science, University of Copenhagen, Thorvaldsensvej 40, DK-1871
Frederiksberg C (Copenhagen), Denmark. nika@plen.ku.dk, krj@plen.ku.dk,
moe@plen.ku.dk

ABSTRACT

A new *Cryptocoryne* hybrid, *Cryptocoryne* × *hendrae*, from the Meratus mountains, South Kalimantan, Indonesia, is described and illustrated. *Cryptocoryne* × *hendrae* is a hybrid between *C. hodoroi* and *C. striolata*; it differs from *C. hodoroi* by shorter and broader leaves and by the dark purple colours of the spathe limb, collar zone and tube opening, and it differs from *C. striolata* by having lanceolate, ± green and bullate leaves.

KEY WORDS

Cryptocoryne, natural hybrid, South Kalimantan, Indonesia, Meratus mountains, Mt. Besar

INTRODUCTION

South Kalimantan has a mountain range, the Meratus mountains, east and northeast of Banjarmasin, stretching south to north around 300 km, with the highest peak Gunung (Mt.) Besar, of almost 1900 m. a.s.l. The mountain range mainly consists of a mixture of rocks of Cretaceous origin, viz. sediment rocks, mélange, ultra-basic and

alkali rocks. This rock complex gives rise to mixed sediments in the rivers and streams from the highlands, traditionally termed “limestone” sediments, relative to the acid streams and rivers of the lowlands. The highland mountain rivers and streams have swiftly running water developing a very different topography. Consequently, the *Cryptocoryne* species composition differs, e.g. with occurrence of *Cryptocoryne budoroi* Bogner & N. Jacobsen and forms of *C. striolata* Engl., both belonging to a group of $2n = 20$ chromosome species (Arends et al. 1982; Jacobsen 1985).

Takashige Idei made collections of *C. budoroi* in the Mt. Besar area in 1999 and later (Idei 2006) also including reports on *C. striolata* from the region. Based on Idei’s data, an expedition was made by Hendra Budianto and Suwidji Wongso in 2003 to the area near Loksado. They found *C. budoroi*, area code KL0306 and a cordate leaved form of *C. striolata*, area code KL0307. A closer examination of collected plants from the KL0307 area revealed that some of the plants differed (*SW0307B*) from the others (*SW0307A*). The specimens have now been in cultivation for a number of years, during which we have been considering the affinities to other *Cryptocoryne* species. Years ago, Hendra Budianto suggested that *SW0307B* could be a hybrid. Due to sterile pollen (stained with Cotton Blue (Wongso & al. 2019)), and the intermediate appearance between *C. budoroi* and *C. striolata*, we propose that it is an interspecific hybrid between the two, supported by the fact that the parent species

occur in the same river system: the leaves of the hybrid mostly resemble *C. budoroi*, while the spathe limb colours resembles those of *C. striolata*.

Cryptocoryne striolata (*SW0307A*) and the hybrid (*SW0307B*) were found coexisting in the same stream. *Cryptocoryne striolata* grew in the middle part with a hard substrate, higher water level and faster flow, while the hybrid was found along the bank with a softer flow and substrate. *Cryptocoryne budoroi* has been found in the same river system some kilometers downhill. Our opinion is that the morphological characters of spathe and leaves, the pollen sterility and geographic distribution strongly suggest that *SW0307B* represents a hybrid between *Cryptocoryne budoroi* and *C. striolata*.

***Cryptocoryne* × *hendrae* Wongso, nothosp. nov. – Figures 1–6.**

Holotype: Indonesia, Borneo, South Kalimantan Province, South Hulu Sungai Regency, Meratus mountains, E of Kandangan, Nandan River, near Kpg. Loksado. *SW0307B*, collected 15th August 2003, preserved 17th September 2019. Alt. c. 250 m. Holotype BO, isotype C.

Diagnosis: Leaf blades narrowly lanceolate, bullate, green, sometimes brownish along the margin or over the whole ± shining surface, green to red on the lower surface. *Spathe* with a long tube, limb with a long, irregular coiled tail, tube opening with a black purple to black purple



Figure 1. *Cryptocoryne × hendrae*, SW0307B. **A.** Submerged specimens along stream bank at type locality, Nandan River; **B.** Also, with emergent plants by the same stream. Photographs: A. by H. Budianto, B. by S. Wongso.

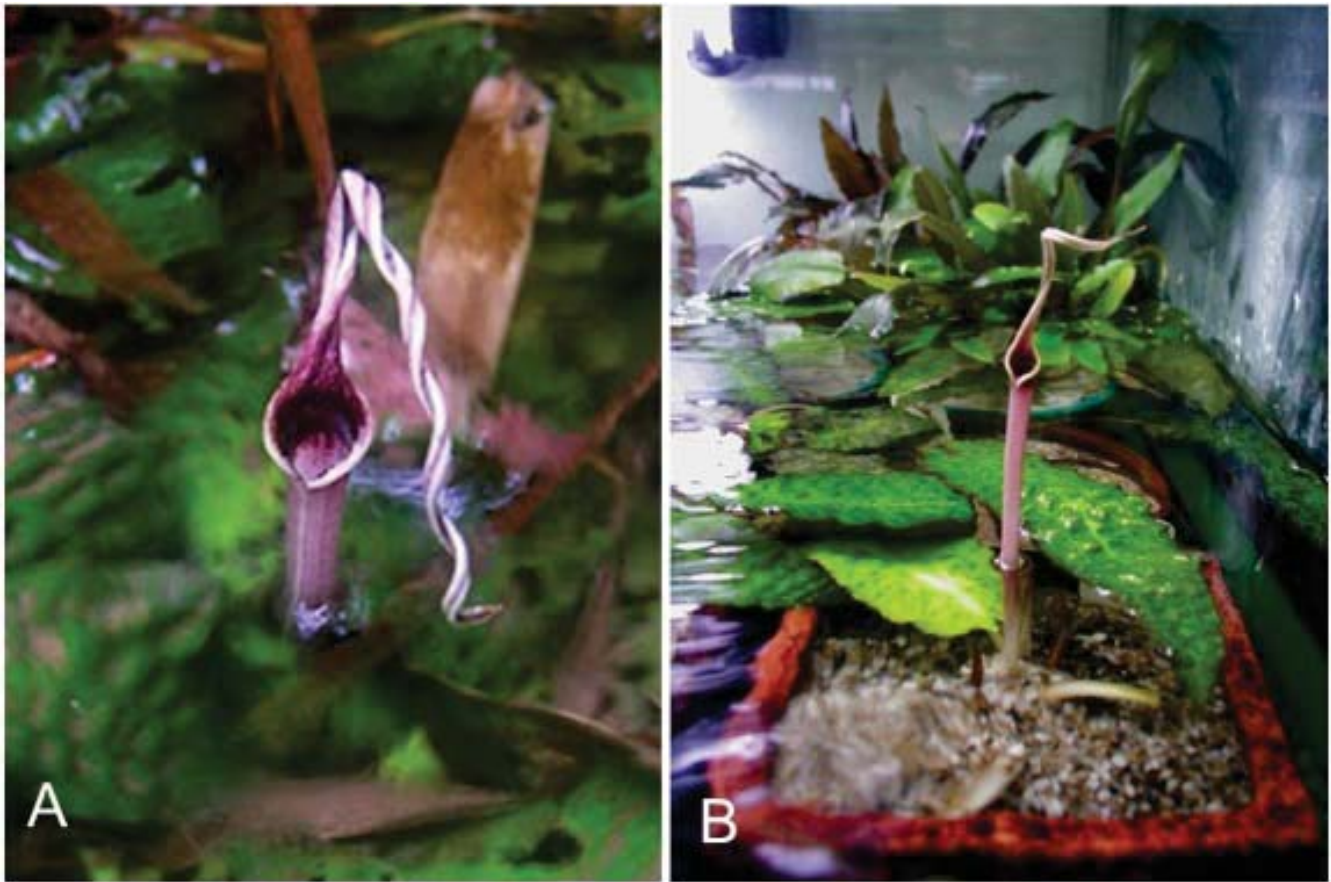


Figure 2. *Cryptocoryne* × *hendrae*. **A.** Flowering specimen *in situ*; **B.** Cultivated specimen of SW0307B. Photographs: A by H. Budiando, B by S. Wongso.

spotted collar zone, surface upwards of a lighter purple colour. Pollen fertility 0%.

Description: *Amphibious herb* with subterranean stolons. *Leaves* 5–10, 15–25 cm long, *lamina* up to 12 × 4 cm, lanceolate with an obtuse to truncate to narrowly cordate base, apex acute, ± bullate, green, sometimes brownish along the margin or whole surface ± shining brownish over the surface, green to shades of red to red on the lower surface. *Spathe* 15–25 cm long, outside ± purplish colored; *kettle* c.1 cm long, rounded, inside white *flap* whitish-yellowish;

tube 8–18 cm long; *limb* 4–8 cm long with an irregularly coiled tail, tube opening with a black purple to black purple spotted collar zone, surface upwards of a lighter purple colour. *Spadix* c. 1 cm long, with 5–6 *female flowers* with broadly ovate to almost emarginate stigmas; *olfactory bodies* irregularly rounded, yellow and purplish spotted; *male flowers* 40–50, pollen fertility 0%; *appendix* dull purplish. *Syncarp* not known. Interspecific hybrid between *C. budoroi* and *C. striolata*.

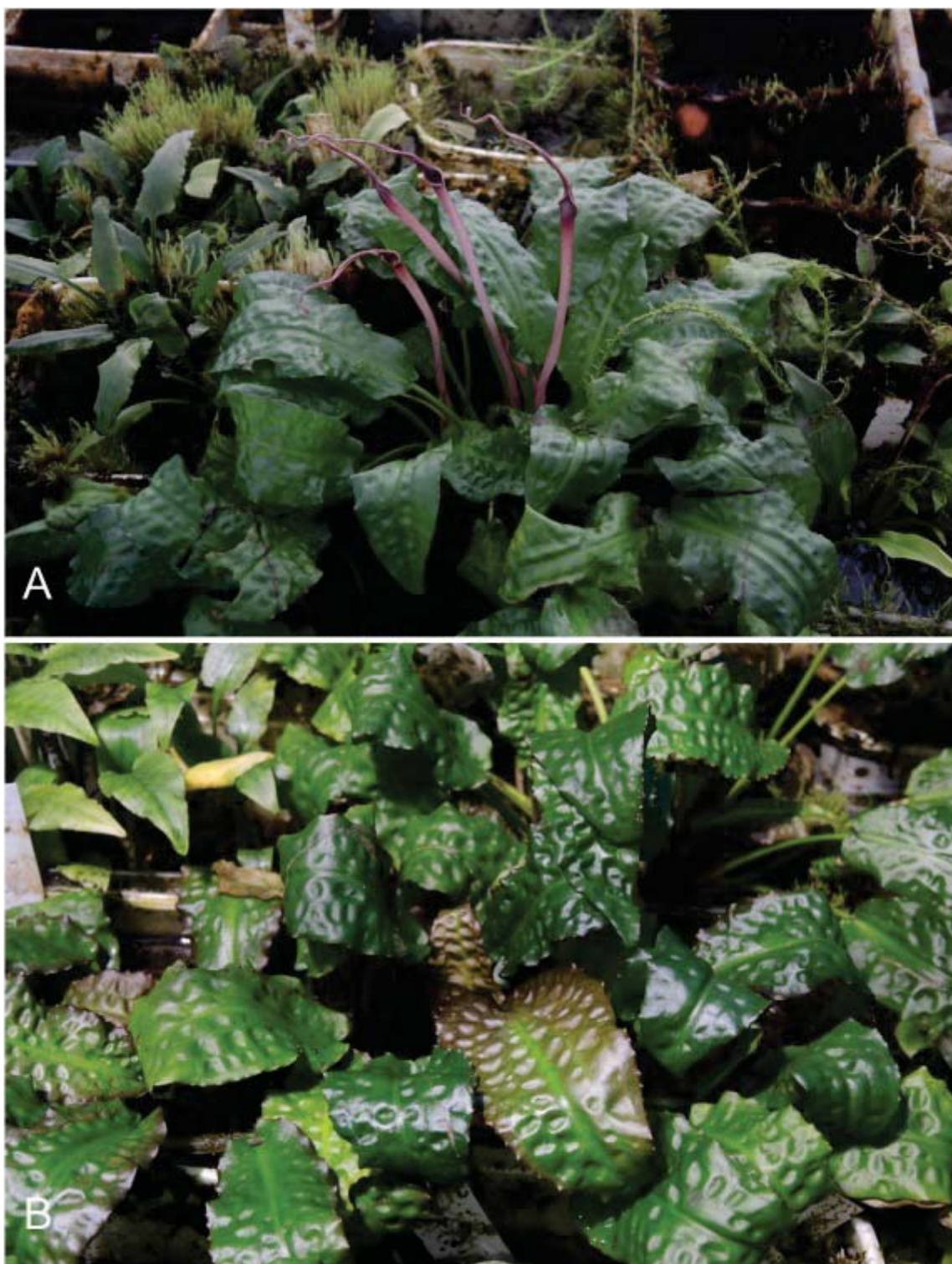


Figure 3. *Cryptocoryne* × *bendrae*. **A.** Type specimen, SW0307B, flowering 17th September 2019; **B.** Type specimen showing variation in leaf colouring. Photographs by N. Jacobsen.



Figure 4. *Cryptocoryne* × *hendrae*, from SW0307B; **A.** Spathe; **B.** Spathe limb. Photographs by S. Wongso.



Figure 5. *Cryptocoryne* × *hendrae*, from SW0307B; **A.** Cut open kettle at the female stage with receptive stigmas and immature male flowers; flap bent downwards and entrance open; **B.** Like A but at the male stage with dried out stigmas and mature male flowers extruding pollen droplets; flap raised upwards blocking the exit. Photographs by S. Wongso.

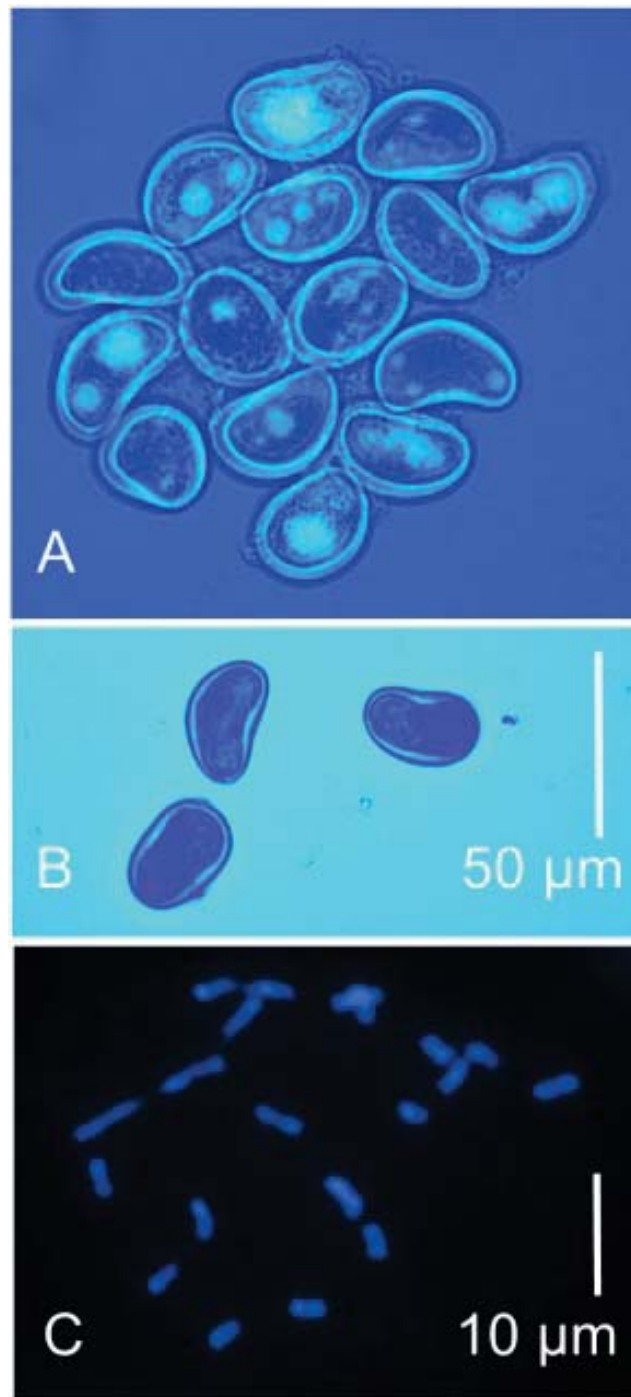


Figure 6. Pollen micrographs. **A.** *Cryptocoryne* \times *hendrae*, from *SW0307B*. Showing the defective pollen, stained with Cotton Blue, with a lumpy, unevenly blue coloured cytoplasm, indicating not total incongruity between the parent species (total incongruity would result in unstained pollen); **B.** *C. striolata*, showing perfect pollen with evenly blue coloured cytoplasm, from *SW0913*, W Kalimantan, Kapuas Hulu Regency, c. 40 km NW Putussibau, 29 September 2009; **C.** *C. x hendrae* DAPI stained (Wongso & al., 2017) chromosomes from *SW0307B*, showing $2n = 20$. Photographs by K. R. Jensen.



Figure 7. *Cryptocoryne striolata*, SW0307A. **A.** Submerged specimens in stream; **B.** Submerged stand in slowly running water. Photographs: A by S. Wongso, B by T. Idei.



Figure 8. *Cryptocoryne striolata*, SW0307A. **A.** Submerged plant in situ at the stream bank; **B.** Plant with a spathe and an almost mature infructescence; **C.** Plant with two spathes and the cordate, somewhat bullate leaves. Photographs: A by T. Idei, B—C by S. Wongso.

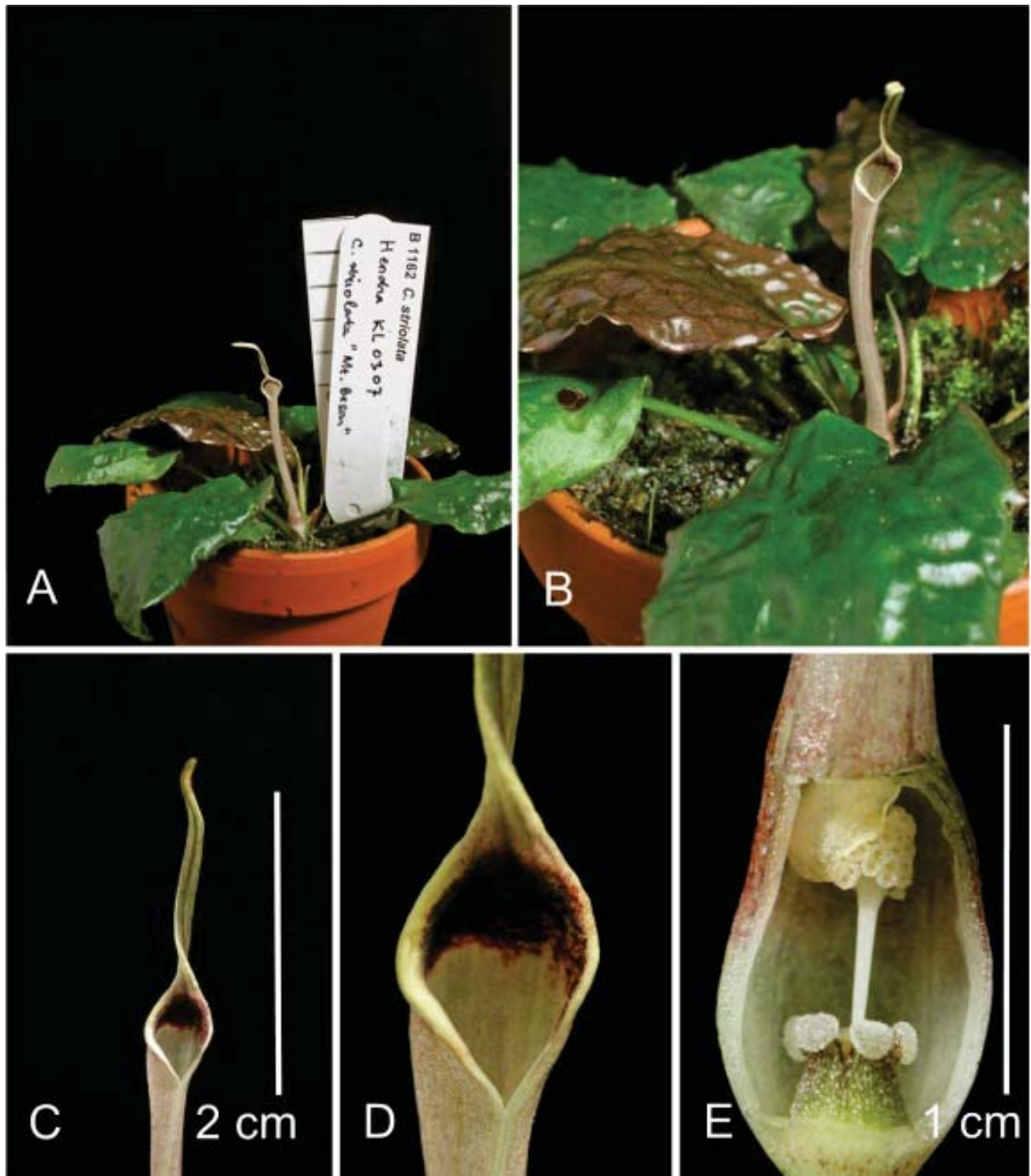


Figure 9. *Cryptocoryne striolata*, SW0307A (area code KL 0307). **A.** Cultivated plant with a spathe and the cordate leaves; **B.** Closeup of A and showing the different colours the leaf blades may have; **C.** Spathe limb; **D.** Spathe limb with a close up of the tube opening; **E.** Cut open kettle showing the female and male flowers (partly hidden behind the flap). Photographs by J. D. Bastmeijer.



Figure 10. *Cryptocoryne budoroi*, KL0306 (area code), Kandangan towards Batu Licin. **A.** Habitat with a substrate of sand and gravel mixed with plant debris; **B.** Flowering plant among dead plant leaves; **C.** Flowering plant showing the characteristic lanceolate, green bullate leaf blades [Called “Lumut Sisik Naga”, Dragon Scale Water Plant, by local people]. Photographs by S. Wongso.

Chromosome number: $2n = 20$, reported here for *SW0307B*.

Distribution: Endemic to Indonesia, S Kalimantan, South Kalimantan Province, South Hulu Sungai Regency, E of Kandangan.

Habitat: Small river 2 m wide with a sandy substrate with gravel, silt, and compost mixture; moderate flow rate, clear water. Submerged and emergent plants. Called "Capit Katam" (Crab's pincer) by local people. The water had a pH of 7.50; ORP 260mV; TDS 91ppm; Cond. 200 μ S/cm; WTP 26.0 °C (15:15); KH 4, GH 5.

Conservation status: Data Deficient (DD) (IUCN/SPS, 2019): only known from the type locality; more observations are needed in order to outline a conservation assessment.

Eponomy: Named after Hendra Budianto, a long-time investigator of *Cryptocoryne* of Indonesia, especially South Kalimantan.

Remarks: In the key to the *Cryptocoryne* of Borneo (Wongso et al. 2017) *C. ×hendrae* keys out in lead 10 together with *C. hudoroi* which should then read:

10. Leaf blade narrowly ovate to cordate, 3–12 cm long, usually flat ***C. striolata***

– Leaf blade narrowly ovate to lanceolate, 10–30 cm long, noticeably bullate **11**

11. Leaf blade 8–15 × 3–4 cm; spathe limb black purple in the tube opening ***C. ×hendrae***

– Leaf blade 10–30 × 2–5 cm; spathe limb yellowish, with small spots in the tube opening ***C. hudoroi***

Cultivation: *Cryptocoryne ×hendrae* is easily cultivated submerged or halfway emergent in a soil mixture of gravel containing limestone and leaf litter soil, or mulched bamboo leaves.

REFERENCES

- Arends, J. C., J. D. Bastmeijer & N. Jacobsen. 1982. Chromosome numbers and taxonomy in *Cryptocoryne* (Araceae). II. *Nord. J. Bot.* 2: 453–463.

- IUCN, 2019. Guidelines for using the IUCN Red List categories and criteria. Version 14. Prepared by the Standards and Petitions Subcommittee of the IUCN Species Survival Commission. – Published at <http://cmsdocs.s3.amazonaws.com/RedListGuidelines.pdf> [accessed 07.01.2020].
- Idei, T. 2006. Die Natürlichen Standorte der *Cryptocoryne budoroi* Bogner & Jacobsen. *Aqua Planta* 31 (4): 151–161.
- Jacobsen, N., 1985. The *Cryptocoryne* (Araceae) of Borneo. *Nord. J. Bot.* 5: 31–50.
- Wongso, S., J.D. Bastmeijer, H. Budianto, I.B. Ipor, K.R. Munk, M. Ørgaard and N. Jacobsen. 2017. Six new *Cryptocoryne* taxa (Araceae) from Kalimantan, Borneo. *Willdenowia* 47(3): 325–339. DOI: <https://doi.org/10.3372/wi.47.47314>
- Wongso, S., N.P.S. Asih, J.D. Bastmeijer, W. Reichert, K.R. Jensen, M. Ørgaard and N. Jacobsen, 2019. Four new *Cryptocoryne* (Araceae) from Sumatera, Indonesia: a new variety and three interspecific natural hybrids. *Taiwania* 64(3): 126–138. DOI: 10.6165/tai.2019.64.326