

## New Distributional Record of *Lecanorchis nigricans* Honda (Orchidaceae) and a New Addition for the Orchid Flora of Indonesia

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A new locality of *Lecanorchis nigricans* from West Java, Indonesia, is reported, and a description based on the Javanese material is provided. Since *L. nigricans* was known previously from Japan, Taiwan, Fujian (China) and Thailand, this discovery represents the southernmost occurrence of the species. Based on the chasmogamous flowers, spatulate sepals and petals, and cucullate lip, these plants should be *L. nigricans* var. *yakushimensis* among the three varieties of *L. nigricans*. Considering that species of *Lecanorchis* are easily overlooked in the wild due to their short flowering season and dwarf habit, *L. nigricans* may be more widely distributed in Southeast Asia.

Keywords: flora, new locality, mycoheterotrophy, taxonomy.

The mycoheterotrophic genus *Lecanorchis* Blume comprises ca. 30 species, with some endemic taxa reported from many regions of Southeast and Eastern Asia (Seidenfaden 1978, Lin 1987, Hashimoto 1990, Pearce & Cribb 1999, Szlachetko & Mytnik 2000, Pridgeon *et al.* 2003, Averyanov 2005, 2011, 2013, Suddee & Pedersen 2011, Suetsugu & Fukunaga 2016). *Lecanorchis* can be distinguished from other orchid genera by its numerous long, thick, horizontal roots that extend from a short rhizome, calyculus located between the base of the perianth and apex of the ovary and an elongate column with small lateral, apical wings (Seidenfaden 1978, Hashimoto 1990).

However, precise identification of the species of *Lecanorchis* is often hindered by their overall morphological similarity and brief flowering periods and, in herbarium specimens, by the absence of important diagnostic characters. Flowers of *Lecanorchis* in herbarium material

are easily lost or damaged during preservation (Suetsugu *et al.* 2016, 2017a, b, 2018a, b, c, d). Owing to the difficulty of identifying the species of *Lecanorchis*, diversity in the genus is likely to be underestimated (Suetsugu *et al.* 2016, 2018b).

In early February 2020, the third author, Yudistira, collected flowering specimens of *Lecanorchis* in a highland forest in West Java, Indonesia. After carefully studying the specimens, we concluded that they were one of three intraspecific varieties of *Lecanorchis nigricans* Honda, a species previously recorded from eastern Asia to the Indochinese Peninsula. Given that the plants bore chasmogamous flowers, spatulate sepals and petals, and cucullate lip, we determined them to be *L. nigricans* var. *yakusimensis* T. Hashim., representing a new addition to the orchid flora of Indonesia. It is here described and illustrated based on the new collections from Java.

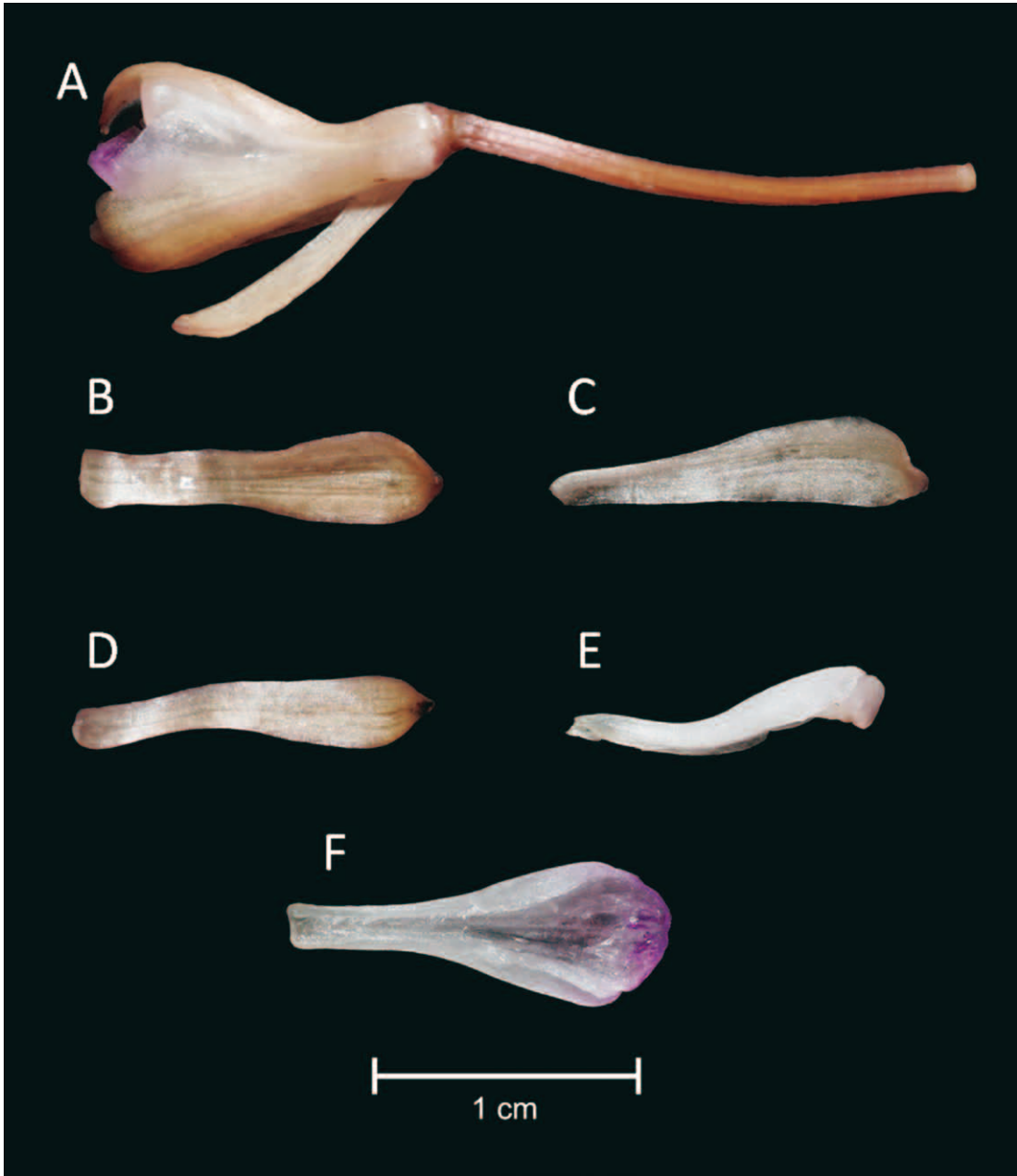


FIG. 1. *Lecanorchis nigricans* var. *yakusimensis* from West Java, Indonesia. A, flower, side view. B, dorsal sepal, adaxial view. C, petal, adaxial view. D, lateral sepal, adaxial view. E, column, side view. F, lip, natural shape, upper view. Materials from Yuda Rehata Yudistira 001 (BO). Photos by Yuda Rehata Yudistira & Destario Metusala.

### Materials and Methods

Measurement and morphological description were based on living plants, spirit materials and dried herbarium specimens collected in the

Cakrabuana Mountain, West Java, on 16 February 2020. To compare their morphology, we undertook a thorough literature review of *Lecanorchis* (e.g. Seidenfaden 1978, Lin 1987, Comber 1990, Hashimoto 1990, Suddee & Peder-

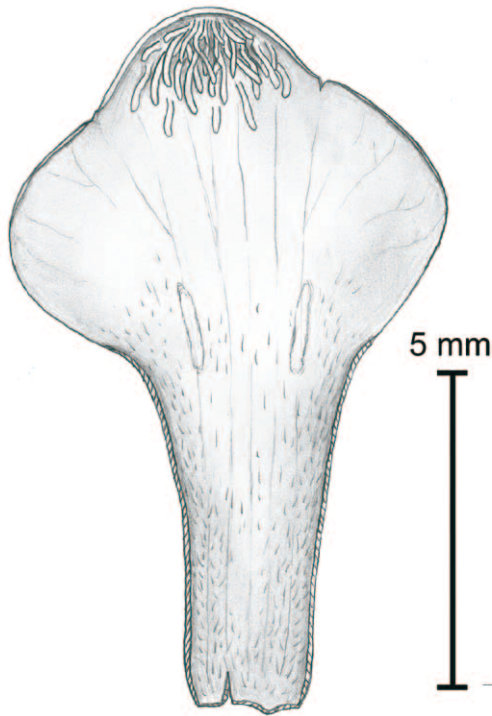


FIG. 2. Flattened lip of *Lecanorchis nigricans* var. *yakusimensis* from West Java, Indonesia. Materials from Yuda Rehata Yudistira 001 (BO). Line drawing by Destario Metusala.

sen 2011, Suetsugu *et al.* 2018b), conducted field sampling throughout Japan and examined specimens in multiple herbaria (KAG, KANA, KPM, KYO, MBK, OSA, TI and TNS; abbreviations follow Index Herbariorum; Thiers 2020, <http://sweetgum.nybg.org/science/ih/>) as well as online digital images of plant specimens on JSTOR Global Plants (<http://plants.jstor.org/>).

## Taxonomic treatment

***Lecanorchis nigricans* Honda var. *yakusimensis***  
T. Hashim. in *Ann. Tsukuba Bot. Gard.* 9: 31 (1990), emend. Suetsugu & Fukunaga in *PhytoKeys* 92: 30 (2018) — Figs. 1 & 2.

*Specimens examined.* INDONESIA. Java, West Java Province, Sumedang District, Cakrabuana Mountain, 1,200–1,300 m alt., 16 February 2020. Yuda Rehata Yudistira 001 (spirit specimen: BO!), Yuda Rehata Yudistira 003 (dried herbarium specimen: BO!).

Herbs, terrestrial, mycoheterotrophic. Rhizome erect, J-shaped, ligneous. Roots numerous, simple, radiate, elongating to 16 cm, velamentous, dark yellowish-brown in age. Inflorescence 18–21 cm tall, 0.8–1.5 mm in diam., solitary, white at flowering, glabrous, with scale-like sheaths. Rachis 4–4.2 cm long, 3- or 4-flowered. Floral bracts narrowly triangular, acute, 1–2 mm long, glabrous on both surfaces, apex acute. Pedicel and ovary cylindrical, 2–2.2 cm long, glabrous, brownish. Flowers widely opening, ca. 2.5 cm in diameter. Dorsal sepal light cream, oblanceolate-spatulate, 13–15 mm long, 1.7–2 mm wide at base, widening gradually to 3 mm at the widest part near apex, glabrous, thin textured, apex obtuse. Lateral and median sepals alike in shape and size. Petals light cream, oblong-oblanceolate, 13–14.5 mm long, 2 mm wide at base, widened gradually to 2.5–3 mm at widest part near apex, glabrous, thin textured, apex obtuse. Lip unlobed to indistinctly trilobed, spatulate, 12–14 mm long, 7–8 mm wide when flattened, white, semi-transparent with purplish tinge at apex, disc with sparse long multicellular hairs near apex, the hairs rarely branched. Column slender, 11–12 mm long, 1.5–2 mm wide, arcuate, fused with lip for 50–60% of its length from base, dorsally and ventrally glabrous, white; anther sub-rectangular in front view, 1.5–2 mm tall, 2 mm wide, purplish-white. Capsule not seen.

*Habitat and phenology.* *Lecanorchis nigricans* var. *yakusimensis* often grows in dense humid forests dominated by *Quercus lineata* Blume, *Ficus* spp. and *Rhododendron* spp. at altitudes of about 1,200–1,300 m in West Java, Indonesia. The habitat is always covered in mist, with very low light intensity during the daytime. *Lecanorchis nigricans* var. *yakusimensis* also grows sympatrically with other orchids, such as *Corybas umbrosus* J. Dransf. & J. B. Comber, *Nephelaphyllum tenuiflorum* Blume, *Bulbophyllum capitatum* Blume, *Bulbophyllum cernuum* (Blume) Lindl., and *Crepidium acuminatum* (D. Don) Szlach. Flowering in the wild was observed in February and March.

*Note.* Among the species of *Lecanorchis*, only *L. multiflora* J. J. Sm. and *L. javanica* Blume are known from Java (Comber 1990). Our material is distinguishable from *L. multiflora* by its 3–5-flowered (vs. frequently more than 10-flowered) inflorescences, longer sepals and petals (13–15 vs. 9–12 mm) and a longer lip (12–14 vs. 10–11 mm) without a pair of calli on the disc (Suetsugu *et al.* 2017b). The identity of *L. javanica* has remained problematic, mainly due to an incomplete original description and the poor condition of the type specimen (Blume 1856, 1858, Suetsugu *et al.* 2019). The protologue of *L. javanica* by Blume (1856), “labello gynostemium inferne amplectente, limbo subimberbi,” is brief and vague and cannot be used to distinguish among specimens. The description and line drawing later published by Blume (1858) indicates that the lip is simple, unlobed and sparsely hairy and slightly adnate to the column. Because the column is fused with lip for more than 50% of its length, our material differs from *L. javanica*. We also note that although Comber (1990) reduced *Lecanorchis pauciflora* J. J. Sm. to synonymy under *L. javanica*, it is highly possible that *L. javanica sensu* Blume (1856, 1858) is different from *L. pauciflora* (Suetsugu *et al.* 2019). However, our material is distinguishable from *L. pauciflora* because it has indistinctly trilobed lip, while the lip of *L. pauciflora* is distinctly trilobed with triangular side lobes (Smith 1918).

*Lecanorchis nigricans* and *L. taiwaniana* S. S. Ying have long been confused, mainly because of the shared apical light purplish coloration, but recent nomenclatural, morphological and genetic studies have demonstrated their distinction (Suetsugu *et al.* 2016, 2018b). Morphologically, *L. taiwaniana* can be clearly distinguished from *L. nigricans* by having a longer peduncle, rachis and internodes, slightly narrower sepals and petals and pale brown, ascending capsules (Suetsugu *et al.* 2016, 2018b). Consequently, the reports of *L. nigricans* in some regions have become questionable; it was revealed that specimens previously recorded in Vietnam as *L. nigricans* are *L. taiwaniana* (Truong *et al.* 2020). However, our specimens clearly exhibit the morphological charac-

teristics of *L. nigricans* (i.e. dark brownish rachis and slightly wider, more spatulate sepals; Suetsugu *et al.* 2016, 2018b). So far, *L. nigricans* has been recorded from Japan, Taiwan, Fujian (China) and Thailand (Suetsugu *et al.* 2016, 2018b). Therefore, our discovery represents the southernmost occurrence of the species. Considering that plants of *Lecanorchis* are easily overlooked in the wild due to their short flowering season and dwarf habit, *L. nigricans* may be more widely distributed.

We also note that *L. nigricans* var. *nigricans* produces only completely cleistogamous flowers. *Lecanorchis nigricans* var. *patipetala* Y. Sawa and *L. nigricans* var. *yakusimensis* have often been treated as synonyms of *L. nigricans* var. *nigricans*. The chasmogamous variety, *L. nigricans* var. *yakusimensis*, can be easily distinguished from the other chasmogamous variety, *L. nigricans* var. *patipetala*, by its more spatulate sepals and petals and longer cucullate lip (Hashimoto 1990, Suetsugu *et al.* 2018b). Our chasmogamous specimens share some diagnostic characters of *L. nigricans* var. *yakusimensis*, including spatulate sepals and petals, and a cucullate lip. It should be noted that there are a few minor differences between the plants on Java and typical *L. nigricans* var. *yakusimensis*. Notably, the sepals and petals of the Javanese plants do not exceed 3 mm in width, while those of var. *yakusimensis* at the type locality are 3.3–4 mm wide. Therefore, the Javanese material is closer to *L. nigricans* var. *patipetala* in sepal width. In addition, the column of the Javanese plants is ventrally glabrous, although the pubescence at the ventral surface of the column was highlighted as one of the diagnostic characters of *L. nigricans* var. *yakusimensis* (Hashimoto 1990). However, Suetsugu *et al.* (2018b) observed that this character is highly variable and cannot be used as a diagnostic character. Taken together, we still consider the Javanese plants to be *L. nigricans* var. *yakusimensis*, since spatulate sepals and petals, and a cucullate lip are important diagnostic characters of *L. nigricans* var. *yakusimensis* (Hashimoto 1990, Hsu & Chung 2020, Suetsugu *et al.* 2018b). Alternatively, given that some characteristics between *L.*

*nigricans* var. *yakusimensis* and *Lecanorchis nigricans* var. *patipetala*, such as the width of sepals and petals, appear to be continuous, it may be appropriate to treat all varieties as *L. nigricans* as one broadly variable taxon. We are reluctant to do so, since *L. nigricans* var. *nigricans* is completely different due to its cleistogamous nature that should prevent gene flow with other varieties (Suetsugu *et al.* 2018b). Similarly, considering that *L. nigricans* in Fujian (China) and Thailand also produces chasmogamous flowers (Suddee *et al.* 2010), they should not be *L. nigricans* var. *nigricans*. Further clarification of the taxonomy of *L. nigricans* will be needed for the future study.

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