



Orchidantha anthracina (Lowiaceae), a new species from Vietnam

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Key words

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Orchidantha inouei
Orchidantha vietnamica
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Zingiberales

Abstract *Orchidantha anthracina* (Lowiaceae), discovered at the south central coast of Vietnam, is described and illustrated, bringing the total number of species in the family to 26, of which four occur in Vietnam. The notes on distribution, habitat and etymology are given and a preliminary conservation assessment is provided. The species is compared with *O. vietnamica*, with which it shares flowers of similar size and colours, but from which it is readily distinguished by a narrow and strongly reflexed dorsal sepal and spreading lateral sepals, not supporting the labellum. Notes with additional comparisons to all species with a similar arrangement of lateral sepals are also provided.

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INTRODUCTION

Lowiaceae, comprising only the single genus *Orchidantha* N.E.Br. (Brown 1886) is the second but last species poorest among the eight families in the *Zingiberales*. The family is restricted to Asia and was last revised by Holttum (1970), who recognized six species. Since then about 20 species were described mainly from Borneo (e.g., Larsen 1993, Nagamasu & Sakai 1999, Pedersen 2001, Syaouqina et al. 2016, 2019, Poulsen & Leong-Škorničková 2017), but also from Peninsular Malaysia (Leong-Škorničková 2014), Thailand (Jenjittikul & Larsen 2002), Vietnam (Trần & Leong-Škorničková 2010, Leong-Škorničková et al. 2014) and China (Zou et al. 2017, 2019).

A general introduction to the *Lowiaceae* was given in several of the above cited works (e.g. Holttum 1970, Larsen 1998, Pedersen 2001) with further information given in Leong-Škorničková et al. (2014) and Poulsen & Leong-Škorničková (2017), and is therefore not repeated here. Additionally, studies on the complex floral morphology and pollination syndromes in *Lowiaceae* are described in Sakai & Inoue (1999), Pedersen & Johansen (2004) and Vislobokov et al. (2017).

Nine species (and one variety) are found north of the Isthmus of Kra throughout the Indochinese floristic region and into southernmost China. Of these, three species are currently known to occur in Vietnam, namely *O. vietnamica* K.Larsen (Larsen 1973), *O. stercorea* H.Đ. Trần & Škorničk. (Trần & Leong-Škorničková 2010) and *O. virosa* Škorničk. & Q.B.Nguyen (Leong-Škorničková et al. 2014).

Here we describe a new species, *Orchidantha anthracina*, discovered by the first author in the Phú Yên province, at the south central coast of Vietnam. The descriptions are based on

living flowering material from the type collection as well as on living plants in subsequent cultivation. The level of detail and style of description follows recent works of Leong-Škorničková cited above. The general plant terminology follows Beentje (2016). The preliminary conservation assessments are based on the guidelines of IUCN Standards and Petitions Subcommittee (2017).

Orchidantha anthracina H.Đ. Trần, Lưu & Škorničk., *sp. nov.*
— Fig. 1, 2

Similar to *O. vietnamica* K.Larsen in general habit and colour of floral parts, but differs in dorsal sepal fully reflexed and being much narrower than lateral sepals (dorsal 9–11 mm wide, lateral 14–15 mm wide), and lateral sepals spreading and not supporting the labellum (vs dorsal sepal positioned approximately perpendicular to the labellum, 12–14 mm wide, equal in width with lateral sepals, and lateral sepals overlapping and supporting the labellum in *O. vietnamica*). — Type: *Trần Hữu Đăng & Hiếu Cường Nguyễn* TRAN-444 (holotype SGN, including flower in spirit as part of a single specimen; iso SING, including flower in spirit as part of a single specimen), Vietnam, Phú Yên province, Đông Hòa district, Hòa Xuân Nam commune, Núi Đá Bia, N12°53'18.35" E109°23'36.94", c. 130 m elevation, 9 Jan. 2017, flowering.

Etymology. The specific epithet is derived from the Latin *anthracinus*, which describes a shade of coal-black verging upon blue. It refers to the very dark velvety labellum of this species.

Small perennial rhizomatous clump-forming herb, up to 50(–65) cm tall, with 4–9(–12) leaves per shoot; juvenile plants as well as adult plants with distinctly petiolate leaves. *Rhizome* c. 10 mm diam, externally brown to dark brown, internally cream white; roots numerous, 5–7 mm diam, sometimes with root tubers towards the end, root tubers 2–4 by 1–1.4 cm long, fusiform, internally white with pale brown centre. *Leaves* to 60 cm long (inclusive petiole); petiole 5–25 cm long; lamina asymmetrical with sides unequal in width, elliptic, 23–45 by 9–14 cm, shiny on both sides, mid green to dark green adaxially, slightly lighter abaxially, base oblique, obtuse to rounded, apex attenuate, margin wavy. *Inflorescence* on a slender, pale to cream-coloured, subterranean stem with prominent bracts and/or their scars; prophyll triangular, 2-keeled, 10–15 mm long; second bract 2.2–2.7 mm long, cream to pale green, sometimes with a slight reddish tinge, shortly sharply cuspidate; third bract 32–40 mm long, cream to pale green, sometimes with a slight

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Fig. 1 *Orchidantha anthracina* H.Đ. Trần, Luu & Škorničk. a. Habit; b. inflorescence terminated by the basal part of the flower (enveloped by floral bract), cut off just slightly above the ovary; c. flower. — Photos: Trần Hữu Đăng.

reddish tinge, shortly sharply cuspidate; floral bract appearing above the soil or with the proximal part embedded in the soil, cream white at very base, otherwise tinged purple, minutely mucronate, 52–60 mm long, sheathing the ovary extension. *Flowers* with a fairly unpleasant strong smell with tones of blue cheese; pedicel c. 10 mm long; ovary extension 75–80 mm long (including the c. 18 mm long ovary), cream white; sepals cream white to pale yellowish on both sides, sometimes with

slight pale purple tinge externally, glabrous, unequal in size, margin entire, apex minutely cuspidate (1–3 mm); dorsal sepal strongly reflexed, narrowly elliptic, 70–95 by 9–11 mm (at widest point); lateral sepals narrowly elliptic, spreading (not supporting the labellum), c. 75–100 by 14–15 mm (at widest point); lateral petals overlapping at base covering stamens and style, cream white, unequally irregularly bluntly rectangular, prominently apiculate (apicule 3–6 mm long), internal margin

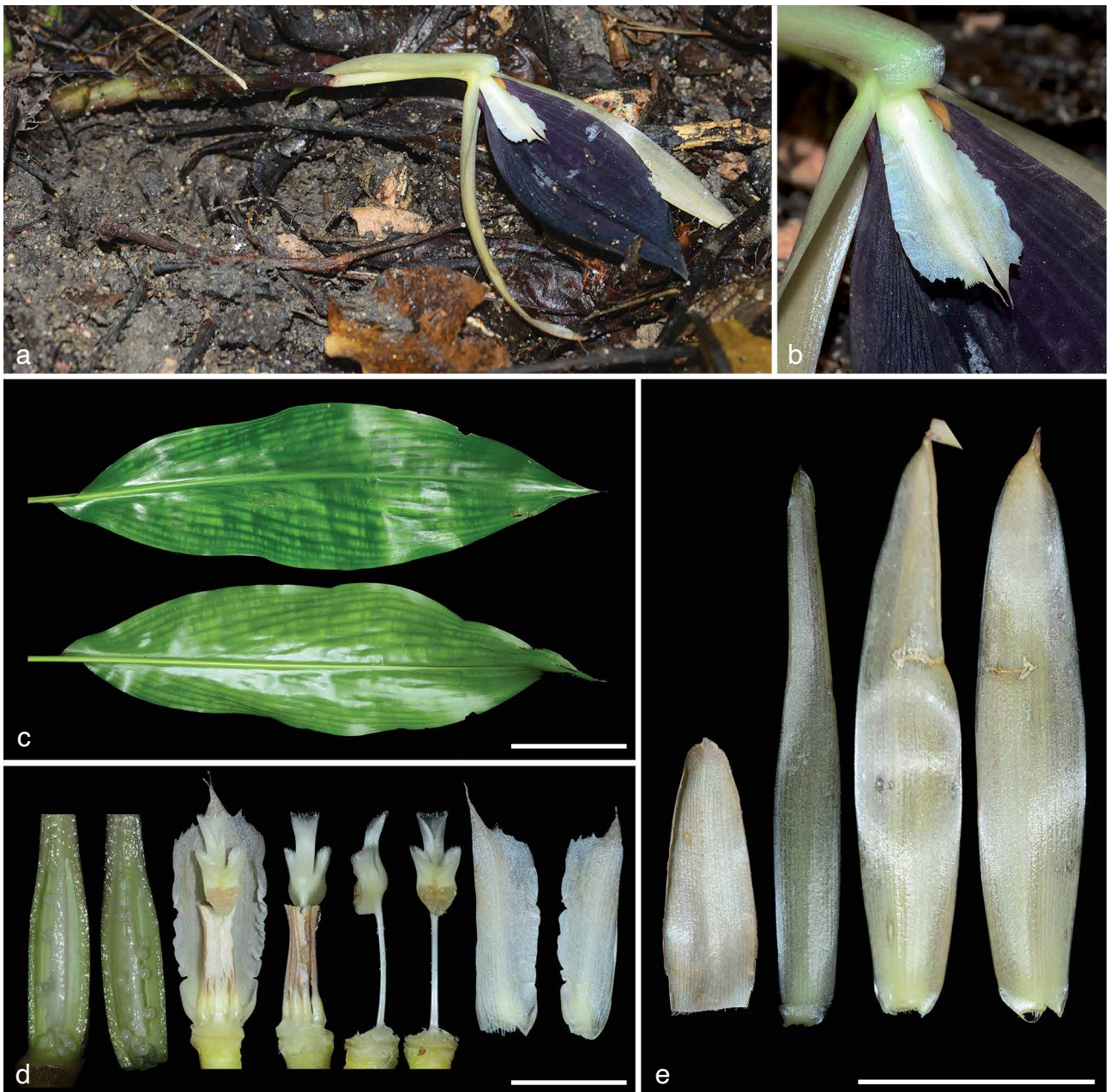


Fig. 2 *Orchidantha anthracina* H.Đ.Trần, Luu & Škorničk. a. Flower; b. detail of petals; c. leaf blade seen from above and beneath; d. details of floral parts (from left): ovary in longitudinal section, stigma with anther and petals attached, stigma (dorsal view with stamens attached, side and ventral view with stamens detached), petals; e. details of floral parts (from left): third bract, dorsal sepal, lateral sepals. — Scale bars: c = 10 cm; d = 10 mm; e = 3 cm. — Photos: Trần Hữu Đăng.

(adjacent to the other petal) straight, exposed margins irregularly crenulate, 20–25 by 5–6 mm; labellum elliptic, 70–90 by 28–35 mm, with slightly raised midrib (2–2.5 mm wide at base, gradually narrowing towards the apex), very deep purple to almost black, with velvety appearance, margins entire and straight at basal 1/2–2/3, irregularly crisped, slightly undulate and with occasional incisions in apical 1/3. *Stamens* 8–10 mm long; filaments 2–3 mm long, swollen, cream-coloured, glabrous; anther thecae introrse, 5.5–7 mm, longitudinally dehiscent throughout the entire length, cream white to pale brown. *Style* cream white, 9–10 mm long; stigma 9–10 mm long, deeply 3-lobed, greenish white throughout; stigma lobes conduplicate, with whitish, semi-translucent, irregularly serrulate margin, median lobe c. 6 mm long, lateral lobes c. 3 mm long; viscidium heart-shaped, each side if the viscidium 3–3.5 mm long. *Fruits* and *seeds* not observed.

Distribution — So far known only from Phú Yên province in Southern Vietnam.

Habitat & Ecology — Lowland, evergreen, broad-leaved forest, near stream. In the field, the flowering was observed to occur from December to January, but in cultivation the plants flower 2–3 times a year.

Conservation status — As previously pointed out by Leong-Škorničková et al. (2014) *Lowiaceae* tend to be endemic, occurring within a very limited area, which has direct implications for conservation. The species is known only from the type locality, where it is not common. Only a single population, estimated to consist of about 300 individuals, has been found. The locality is not within any protected area and the habitat loss is a major concern for this species. We therefore propose to treat this species provisionally as Vulnerable (VU D2).

Notes — Within Vietnam and the rest of continental Asia, the morphologically most similar species is *O. vietnamica*, as outlined in the diagnosis. By the virtue of the same characters (strongly reflexed dorsal sepal narrower than the lateral sepals,

and lateral sepals spreading, not supporting the labellum), *O. anthracina* can easily be distinguished from the remaining two species in Vietnam, *O. stercorea* and *O. virosa*, as well as from *O. laotica* K.Larsen in Laos, and *O. foetida* Jenjitt. & K.Larsen in Thailand, which all have the claw-shaped flower with lateral sepals at least partly overlapping and supporting the labellum. None of the five species occurring in China is similar. *Orchidantha insularis* T.L.Wu, *O. yunnannensis* P.Zou, C.F.Xiao & Škorničk. and *O. crassinervia* P.Zou & X.A.Cai have a claw-like flower and all have a prominent median rib on the labellum, while *O. chinensis* T.L.Wu and *O. longisepala* D.Fang both have sepals dark maroon, front-facing, overlapping at base, somewhat reflexing at upper part and forming an elongated bell-like structure. In Peninsular Malaysia, all species have the dorsal sepal reflexed and the lateral sepals spreading and not supporting the labellum, but the sepals are always purple to maroon or sometimes with greenish bases or apices. Additionally, the colour of the labellum in these species is either white with basal claw (e.g., *O. fimbriata* Holttum, *O. longiflora* (Scort.) Ridl. or *O. siamensis* K.Larsen), or small, broadly elliptic to almost round, and with a purplish or brown tinge (*O. maxillarioides* (Ridl.) K.Schum., *O. lengguanii* Škorničk.) excluding any possibility of confusion. In Borneo, which is considered to be the centre of diversity, most species also have a claw-like flower. There are only four species with lateral sepals not supporting the labellum of which only *O. inouei* Nagam. & S.Sakai and *O. grandiflora* Mood & L.B.Pedersen might be considered somewhat similar to *O. anthracina*. *Orchidantha inouei* has a labellum with the apical quarter whitish, and sometimes also with a white central line (see colour photo in Nagamasu & Sakai 1999), therefore not confusable with *O. anthracina*. *Orchidantha grandiflora* has an entirely dark purple, almost black labellum, similar to that of *O. anthracina* and light to bright green sepals. The dorsal sepal reflexes, and although the lateral sepals loosely support the labellum shortly after the flower opens, they soon start reflexing and disengage from the labellum sometimes resulting in similar appearance as in *O. anthracina*. Although the confusion of these two species is unlikely to happen in the wild, given the vastly separate areas of distribution, they might be confused in cultivation. The main differences with *O. anthracina* lies in the cream white to pale yellowish, unequally wide sepals, smaller labellum 70–90 by 28–35 mm, and shorter stamens 8–10 mm long (compared to bright green almost equal sepals, larger labellum 97–117 by 40–58 mm, and longer stamens 19–20 mm long in *O. grandiflora*). *Orchidantha ranchanensis* Syauqina & Meekiong and *O. borneensis* N.E.Br. have both much smaller flowers with the labellum not exceeding 3.5 cm in length and dark purple petals (compared to labellum 7–9 cm long, and cream white petals in *O. anthracina*).

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