

***Conamomum odorum*, A NEW SPECIES OF Zingiberaceae
FROM CENTRAL VIETNAM**

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Received 8 March 2019, accepted 5 June 2019

ABSTRACT

Conamomum odorum is described as a new species from Khanh Hoa Province, Central Vietnam. It is characterized by sweet smell, striate and narrowly elliptic leaf leaves with short petiole and ligule, ovoid congested inflorescence, pubescent calyx, cream corolla lobes, yellow, obovate and reflexed labellum with median red bands at base and hairy ovary. The new species is illustrated with detailed photographs of key characters and morphologically compared to its closest congeners *C. pierreanum* and *C. rubidum*. A distribution map of the genus in Vietnam is provided.

Keywords: *Conamomum odorum*, fragrant, new species, Vietnam, Zingiberaceae.

Citation: Luu Hong Truong, Tran Huu Dang, Nguyen Quoc Dat, Nguyen Tran Quoc Trung, Tran Gioi, 2019. *Conamomum odorum*, a new species of Zingiberaceae from Central Vietnam. *Academia Journal of Biology*, 41(3): 55–59. <https://doi.org/10.15625/2615-0923/v41n3.13671>.

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INTRODUCTION

Recent phylogenetic study of Alpinieae (Zingiberaceae) has resurrected *Conamomum* Ridley (1899), a genus with about 10 species distributed from Indochina to Malay Peninsula, Singapore, Sumatra and Borneo (de Boer et al., 2018). In Vietnam, the genus has been known with only one species: *C. rubidum* (Lamxay & Lý) Škorničková & Poulsen (Lamxay & Newman, 2012; de Boer et al., 2018).

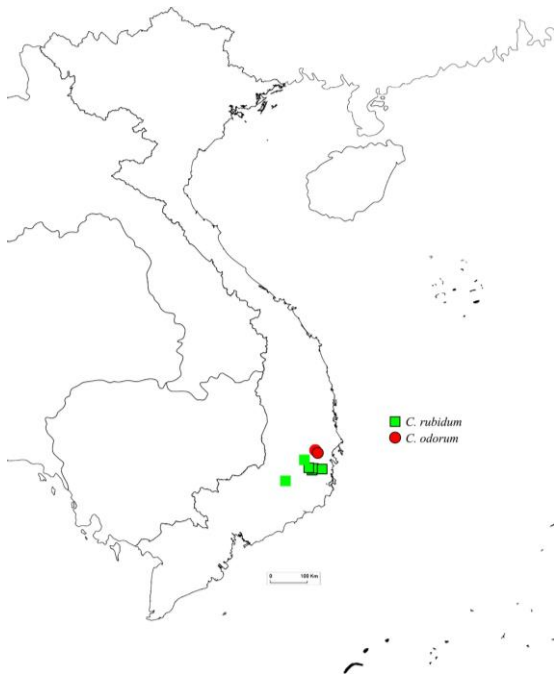


Figure 1. Distribution map of *Conamomum odorum* and *C. rubidum*. Symbols of records supported by specimens are marked by black border. Symbols for sightings supported by photographic records only have no borders

Within a NAFOSTED-funded project, our exploration for Zingiberaceae diversity in Khanh Hoa Province discovered a very fragrant ginger with yellow flowers that looked like *C. rubidum*. After careful examination of the plant, we conclude that it is a new *Conamomum* species which is described as *C. odorum* in this paper. The general plant terminology follows Beentje (2016). A distribution map of *Conamomum*

species in Vietnam is provided (Fig. 1). The preliminary IUCN assessment follows the guidelines of the IUCN Standards and Petitions Subcommittee (2017).

MATERIALS AND METHODS

The specimen of the new taxon was collected from Hon Vong Phu Mountain, Khanh Hoa Province and determined based on comparison of its morphological characteristics with its close congeners'.

RESULTS AND DISCUSSION

Description of the new species

***Conamomum odorum* Luu, H. D. Tran & G. Tran, sp. n.**

Morphologically closest to *Conamomum rubidum* in having yellow flowers, radical inflorescence and 3-lobed labellum with reflexed margins, but differs by smaller laminas (25–30 × 3–3.5 cm), shorter petiole (2–4 mm), ovoid inflorescence, fully pubescent bracts, pubescent calyx, cream corolla lobes, slightly 3-lobed and obovate labellum, hairy ovary and longer filament (ca. 13 mm) (vs. 30–45 × 4.5–7 cm laminas, 5–9 mm petiole, obovoid inflorescence, basally pubescent bracts, glabrous calyx, reddish corolla lobes, strongly 3-lobed and reniform labellum, glabrous ovary and 7–8 mm long filament).

Clump-forming herb, to 1.2 m tall with 10–24 leaves per pseudostem; rhizome branched, 4–6 mm in diameter, externally green-cream, internally cream; interval between pseudostems 4–8 cm, scales broadly triangular, 10–24 mm long, 14–20 mm wide, brown, papery, apex acute. Pseudostem swollen at base (ca. 2.5 cm diameter), light pink when young then become green; ligule 1–2 mm long, light green, glabrous, apex obtuse; petiole 2–4 mm long, light green; lamina narrowly elliptic, 25–30 × 3–3.5 cm, glabrous, upper surface dark green, striate, lower surface lighter colored, sometimes light purple, base attenuate, apex acute to caudate, cauda ca. 1 cm long, margin entire. Inflorescence ovoid, erectly arising from creeping rhizome, congested; peduncle 4–6

cm long, scale triangular, red at base turning green towards apex, 2–2.5 × ca. 2 cm, sericeous; spike 5–7 × 6–10 cm; bracts ovate, 28–32 × 8–11 mm, cream when young, turning papery brownish at early stage, hairy abaxially, ciliate at margin, bracteole tubular, 22–24 × 7–8 mm, unilateral slit 9–10 mm, 2-toothed, teeth with ciliate hairs. Calyx tubular, 17–19 mm long, ca. 3 mm broad at base, 6 mm broad at apex, pubescent, 3-toothed, teeth 2–4 mm long. Floral tube 25–27 mm long, cream at base, yellow towards apex, glabrous; dorsal corolla lobe oblong, 20–25 × 10–11 cm, cream, glabrous, apex rounded, cucullate; lateral corolla lobes oblong, 23–25 × 6–8 mm, cream, glabrous, apex rounded, slightly cucullate; labellum obovate, ca. 26 mm long, 5 mm broad at base, 16 mm broad at apex,

yellow with median red bands at base, reflexed, trilobed; lateral staminode minute, linear, ca. 6 mm long, ca. 1 mm broad at base, acute towards apex, red at base, cream-yellow at apex, with few glandular hairs at base. Filament flat, 13 × 2.5 mm, yellow, sometimes with red tinge at base, anther yellow, ca. 11.5 × 4.5 mm (including crest), connective tissue full of glandular hairs; anther crest trilobed, yellow, glabrous, lateral lobes narrow triangular, ca. 6 × 1 mm, pointing downwards, central lobe semi-circular, ca. 3 × 3.5 mm; epigynous glands two, ca. 2 × 1 mm, yellow; ovary ca. 4 × 3.3 cm, cylindrical, cream, hairy, tri-locular, axile placentation. Stigma cup-shaped, yellow, ostiole ciliate; style ca. 33 mm, cream, sparsely hairy near apex. Fruits not seen (Fig. 2).



Figure 2. *Conamomum odorum*. A. Habit. B. Rhizome and inflorescences. C. Ligule. D. Inflorescence. E. Flower dissection. F. Ovary with epigynous glands and anthers (side and front views) [Photos: Luu Hong Truong]

Typus: VIETNAM, Khanh Hoa Province, Ninh Hoa District, Ninh Tay Commune, Mt. Hon Vong Phu, 12°35'51"N, 108°56'40"E, 660 m elevation, 14 April 2013, Luu Hong Truong, Tran Gioi, Nguyen Thien Tich, Nguyen The Van KH-907 (holotype SGN!, isotypes SGN!, PHH!).

Etymology

The specific epithet refers to the special fragrance of the whole plant. After the specimens are dried, the odor becomes stronger and lasts for several years in the herbarium specimens.

Proposed Vietnamese name

Sa nhân thơm.

Ecology and phenology

The new species grows in closed moist evergreen forests at 600–700 m elevations. Flowering was observed in April. Fruiting is expected to appear in May.

Distribution and IUCN preliminary assessment

Only known from the type locality and another location in Khanh Vinh District,

Khanh Hoa Province (Luu, pers. obs.). Therefore, Extent of Occurrence (EOO) is not estimated. Area of Occupancy (AOO) is estimated at 8 km². As both sites are located outside the national and provincial systems of existing or proposed protected areas and have been undergoing heavy impacts by uncontrolled illegal logging, hydropower dams and deforestation, we propose to rank this species as CR B2b(iii)c(iv).

Notes

The new taxon is morphologically closest to *C. rubidum* as they share the following characters: radical congested inflorescence, yellow and 3-lobed labellum with reflexed margins. However, they can be distinguished by key morphological differences as shown in the diagnosis and table 1. The shape and color of the labellum in *C. odorum* may recall those in *C. pierreanum* Gagnep. from Cambodia (de Boer, 2018; Gagnepain, 1906 & 1908; Lamxay & Newman, 2012) but both species have many different morphological characters (table 1) that make them distinct from each other.

Table 1. Key morphological differences between *Conamomum odorum*, *C. pierreanum* and *C. rubidum*

Characters	<i>C. odorum</i>	<i>C. pierreanum</i>	<i>C. rubidum</i>
Petiole length	2–4 mm	2–3 cm	5–9 mm
Leaf lamina	narrowly elliptic, 25–30 × 3–3.5 cm, striate, with lighter (sometimes light purple) lower surface, attenuate base and glabrous margins	oblong, 30–50 × 5–7 cm, smooth, with pale green lower surface, long attenuate base and glabrous margins	oblong-linear, 30–45 × 4.5–7 cm, smooth, with pale green to purplish-red lower surface, oblique base and hairy margins
Inflorescence	ovoid	globose to ovoid	obovoid
Bracts	fully pubescent	tomentose	basally pubescent
Calyx	pubescent	glabrous	glabrous
Corolla lobes	cream	reddish	reddish
Labellum	obovate, slightly 3-lobed	bowl-shaped, markedly trilobed	reniform, strongly 3-lobed
Ovary	hairy	glabrous	glabrous
Filament	ca. 13 × 2.5 mm, yellow, sometimes red tinge at base	ca. 10 mm long, white	7–8 × ca. 2 mm, white
Epigynous glands	ca. 2 mm long, yellow	ca. 3 mm long, yellow	ca. 4 mm long, white
Overall plant smell	fragrant	-	light odor

Acknowledgements: This research is funded by Vietnam National Foundation for Science and Technology Development (NAFOSTED) under grant number 106-NN.03-2016.77.

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