



Zingiber ottensii Valetton (Zingiberaceae) — a newly recorded species for Vietnam

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Abstract

Zingiber ottensii Valetton was recently discovered for Vietnam from Mount Dầu, Quảng Ngãi; Sao La Nature Reserve, Đông Giang, Quảng Nam; Liên Sơn village, Na Ngòi commune, Kỳ Sơn, Nghệ An. A full description with a colour plate and notes on the variability in morphology, distribution, phenology and uses of this species are given.

INTRODUCTION

Zingiber Mill. (1754: unpagged, Zingiberaceae) comprises of about 144 species (Govaerts *et al.*, 2015) distributed throughout tropical and warm temperate Asia (Wu and Larsen, 2000) with the centre of biodiversity of the genus represents in the Indochinese Peninsula and southern China (Triboun *et al.*, 2014). Gagepain (1908) recognized 12 species of *Zingiber* in his comprehensive treatment on the family Zingiberaceae of the Indochinese floristic region. Leong-Škorničková and Newman (2015) have recently estimated the genus at least 20 *Zingiber* species in Indochina. Phạm (2003) reported 11 species of *Zingiber* in his account of Zingiberaceae for Flora of Vietnam. There are at least 30 species of this genus known in Vietnam including nine new species have recently described (Nguyễn, 2011; Leong-Škorničková *et al.*, 2015b), which belong to four sections namely *Zingiber* section *Cryptanthium* Horaninow, *Zingiber* sect. *Dymczewiczia* (Horaninow) Bentham & Hooker, *Zingiber* sect.

Pleuranthesis Bentham & Hooker and *Zingiber* sect. *Zingiber* (Haraninow, 1862; Bentham and Hooker, 1883). Recent studies, some new ginger species have been described from the South central coastline of Vietnam, including a new genus, *Newmania* N.S. Lý & Škorničk with two new species (*N. serpens* N.S. Lý & Škorničk., *N. orthostachys* N.S. Lý & Škorničk.), and some new species namely *Curcuma sahuynhensis* N.S. Lý & Škorničk. and *Zingiber skornickovae* N.S. Lý have discovered from Mount Dầu, Quảng Ngãi Province (Leong-Škorničková *et al.*, 2011; Leong-Škorničková *et al.*, 2015a; b; Lý, 2016 in press).

During 2011–2015 ginger investigations in the central provinces (prov.) Vietnam, a ginger species, *Zingiber ottensii* Valetton was discovered in Mount Dầu (Quảng Ngãi prov.), Đông Giang District (Quảng Nam prov.) and Kỳ Sơn district, (Nghệ An prov.). This species was previously known throughout Indonesia, Malaysia and Thailand (Valetton, 1918; Theilade, 1998; 1999), but now is a newly recorded species for Vietnam.

MATERIALS AND METHODS

All measurements and descriptions were made from mature and living plants, herbarium specimens and spirit material preserved in 70% ethanol from Vietnam. The terminology in general follows Beentje (2010). The recognition of labellum and lateral staminodes as separate structures and the methodology of the measurements follow the recent work of Bai *et al.* (2015). The cited specimens were preserved in the VNM herbarium, Institute of Tropical Biology and Faculty of Biology (FB), Vinh University.

Taxonomic treatment

Zingiber ottensii Valetton, Bull. Jard. Bot. Buitenz. 27: 136, t.19. 1918; Ridley, Fl. Mal. Pen. 4: 259. 1924; Loesener in Nat. Pflanzenfam. ed. 2. 15a: 588. 1930; Holttum, Gardens Bull. Singapore 13: 56. 1950. —Type: Java, Bogor, Ottens 676 (L: lectotype ex Hort. Bot. Bog.!, K: isolectotype!). **Fig.1.**

Rhizomatous herb 1–1.9 m tall, forming clumps with 3–10 leaf shoots per each clump. *Rhizome* branched, 2.2–3 cm diam., 0.5–2 cm between leafy shoots arising from the same rhizome, externally light yellowish brown, internally pale grey-purplish, aromatic, covered with light brown-yellowish triangular scales, villose, soon decaying. *Leafy shoots* slightly arching, composed of 18–25 leaves, approximately basal 1/3 to 1/5 of pseudostem leafless, base swollen 1.5–2.3 cm diam.; *bladeless sheaths* 5–6, to 60 cm long, green, lower ones bright red, externally sparsely white villose, internally glabrous; *leaf sheaths* green to purplish-green tinge, white villose, densely towards the petiole; *ligules* 1.3–1.5 cm long, membranous, translucent dull white with small reddish dots, white villose, apex entire, papery; *petiole* reduced to a light green pulvinus (3–4 mm long), densely white pubescent; *lamina* elliptic, 36–43 × 6–7.5 cm, adaxially green and glabrous, abaxially light green and sparsely white villose throughout, base obtuse, apex attenuate. *Inflorescence* arising directly from the rhizome, 27–45 cm long, with 2–3 flowers opening at a time; *Peduncle* close to the leafy shoot, radical, erect, 25–29 × 1.2–1.3 cm, covered by 9–12 sheathing bracts, tubular ca. 1/3 at the base, 4–4.5 × 2.5–4 cm (smaller towards the base), externally dull red, greenish-red towards the apex, pubescent, apex entire; *spike* ellipsoid to obloid-ellipsoid, 12–15 × 4.5–4.8 cm; *bracts* enclosing single flower, obovate, 36–38 × 30–32 mm (smaller towards the apex), convex with incurved apex, externally whitish ca. 1/3 of the base, dull red to greenish-red tinge toward apex when flowering and turning bright red

after flowering, pubescent, internally white, glabrous, apex truncate; *bracteoles* narrowly ovate, 32–35 × 12–15 mm, translucent white with reddish apex, externally sparsely white villose, internally glabrous, apex entire or short acute. *Flowers* exerted from bracts, 6.3–6.5 cm long; *calyx* tubular, 20–22 × 7–8 mm, translucent white, glabrous, unilateral incision 9–11 mm, apex acute; *floral tube* 40–42 mm long, widening gradually towards apex, white with pale yellowish towards the apical part, glabrous; *dorsal corolla lobe* narrowly ovate, 21–22 × 7–8 mm, pale yellowish with semi-translucent veins, glabrous throughout, apex acute; *lateral corolla lobes* narrowly ovate, 20–21 × 5–6 mm, pale yellowish, glabrous throughout, apex acute; *labellum* obovate-orbicular, 24–26 × 18–20 mm, pale yellow with faint red-brownish markings, margins undulating, apex rounded with a short cleft ca. 2 mm; *lateral staminodes* obovate, 17–18 × 8–9 mm, connective to the labellum by basal 1/2, pale yellow with faint red-brownish markings, apex rounded. *Stamen* 24–25 mm long; *filament* sessile; *anther* 11–12 × 5–6 mm, connective tissue bright yellow, glabrous; *anther thecae* 10–11 mm long, dehiscing by longitudinal slits; *anther crest* 10–11 mm long (crest not straightened), wrapped around stigma, yellow, glabrous. *Style* to 65 mm long (straightened), white, glabrous; *stigma* 1–2 × ca. 0.8 mm, white, ostiole front facing downwards, with ring of straight ciliates. *Epigynous glands* 2, subulate, 7–8 × 0.6–0.8 mm, cream. *Ovaries* 5–6 × ca. 5 mm, triangular-oblong, pale cream, sparsely villose, trilobular with central placentation. Capsule oblong, 15 mm long, red.

DISTRIBUTION: Borneo, Java, Peninsular Malaysia, Sumatra, Thailand and Vietnam. Vietnam: Nghệ An, Quảng Ngãi, Quảng Nam.

HABITAT: Terrestrial herb. Growing in secondary broad-leave evergreen forest on granite, usually along road side, open areas and forest margin from 25 m to 1107 m.

Phenology: Flowering in August and fruiting in November.

Uses: *Zingiber ottensii* is used as a spice to replace *Alpinia galanga* Willd. in the traditional dishes by the local people around Mount Dầu, Quảng Ngãi province. It is so far used in traditional medicine (Theilade 1998).

Specimens examined: VIETNAM. Quảng Ngãi Province, Nghĩa Hành district, Hành Tín Đông commune, Trường Lệ villages, Mount Dầu, 14°51'11"N, 108°48'15"E, 25 m alt., 10 August 2015, Ngoc-Sâm Lý Lý-



Fig. 1. *Zingiber ottensii*. A. Habit; B. Rhizome with its internal coloration, Inflorescence with leaf shoot (from left); C. Detail of pulvinus and ligules; D. Leaves (adaxial and abaxial views); E. Closed-up of spike with side view of flowers; F. Closed-up of flower; G. Flower (side view); H. Dissection of flowers (from left): Bracts (external and internal views) with flowers, flower with calyx attached, bracteole, two lateral corolla lobes and dorsal corolla lobe (below), labellum with lateral staminodes connate to it (above) (scale bar in cm). I. Ovary with epigynous glands (below, from left), anther (front view) and an apical part of style with stigma (above, from left), floral tube with ovary and stamen attached (scar bar in mm). Photo: Ngoc-Sâm Lý. (from Lý-677).— Photos by Ngoc-Sâm Lý.→

677; Nghệ An Province, Kỳ Sơn district, Na Ngoi commune, Liên Sơn villages, 1107 m alt., 28 May 2014, *Lê Thị Hương 127*; Quảng Nam Province, Tây Giang district, 12 July 2011, *Đỗ Ngọc Đài 145*.

Zingiber ottensii was first discovered in a village near Buitenzorg, Java, Indonesia (Valeton, 1918). It belongs to *Zingiber* section *Zingiber* by having the inflorescences composed of a spike on a long erect peduncle (Horaninow, 1862; Bentham and Hooker, 1883). In Java, *Zingiber ottensii* is the firstly species recorded with the rhizome violet or pink inside, the convex and incurved bract, labellum very faint pink densely impressed with large and small pale yellow spots are very characteristic and differ from the most closed species, *Zingiber zerumbet* (L.) Sm. In general, the plant populations from central Vietnam fit Valeton's description but differ from Valeton's species in having the rhizome pale grey-purplish inside (vs. violet or pink), the bracteoles (32-35 mm long) are much shorter than the longer floral tube 40-42 mm long (vs. as long as the floral tube 35 mm long), the obovate-orbicular labellum (vs. broadly oblong).

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