



## Update on the distribution of *Phallus drewesii* (Phallales, Basidiomycota): new record from Asia

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### Abstract

This paper reports a new record from Asia of *Phallus drewesii*, a phalloid species previously only known from the African Island of São Tomé (Atlantic Ocean). A description and color photographs are provided based upon the Vietnamese specimens. Differences from similar species are briefly discussed.

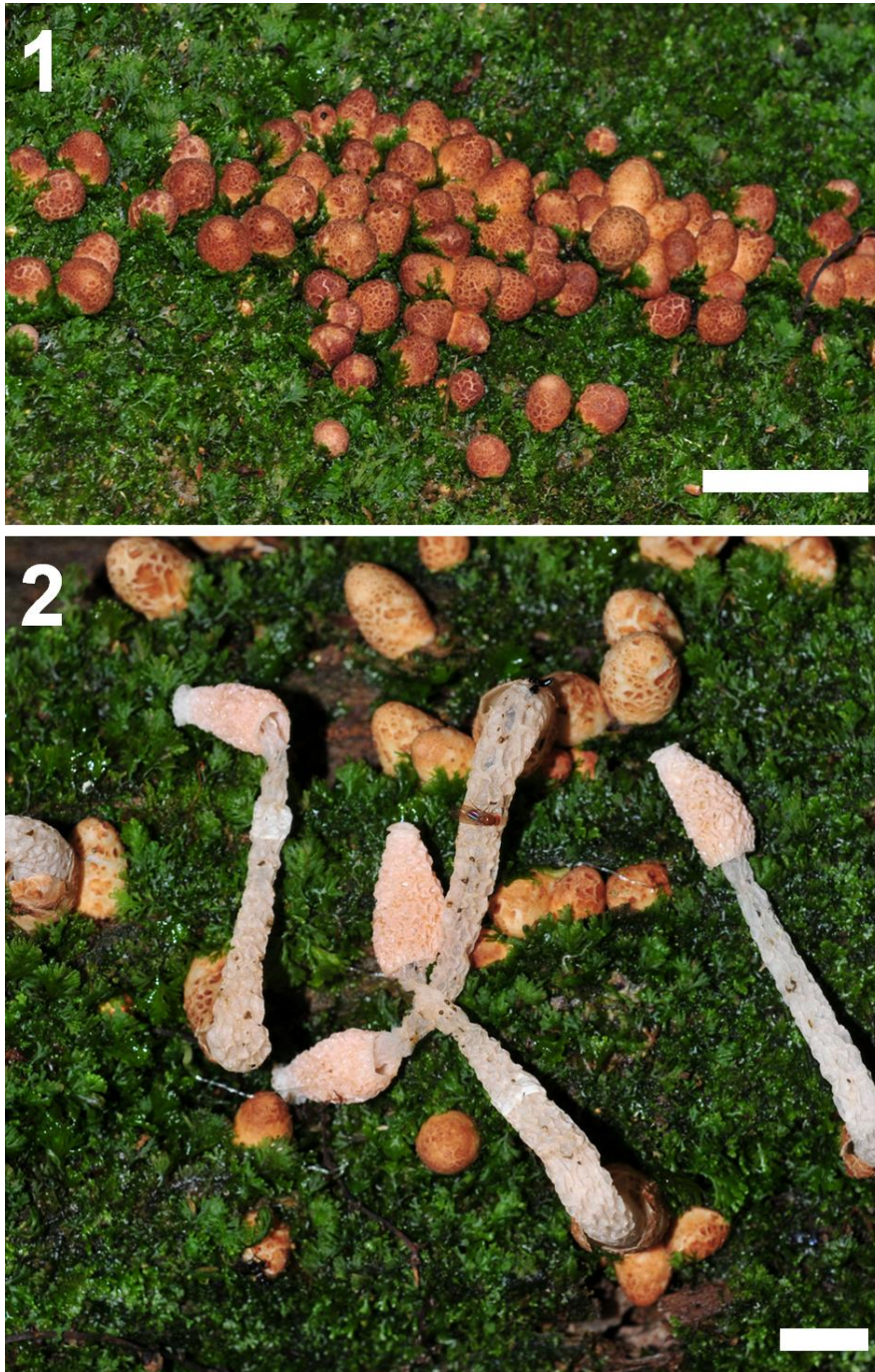
**Key words** – Gasteromycetes – Paleotropical mycota – Phallaceae – stinkhorns.

### Introduction

*Phallus* Junius ex L. is a well known gasteroid genus found worldwide (Kirk et al. 2008). Although some species occur in temperate regions, most members of the genus are found in tropical and subtropical areas, being South East Asia the center of diversity (Kreisel 1996). While some morphospecies have a pantropical distribution, e.g. *P. indusiatus* Schltld., *P. rubicundus* (Bosc) Fr. and *P. callichrous* (Möller) Lloyd, others seems to have a strong endemism.

Examples of species reported from the Paleotropical regions are: *P. caliendricus* Dring, *P. cinnabarinus* (W.S. Lee) Kreisel, *P. echinovolvatus* (M. Zang, D.R. Zheng & Z.X. Hu) Kreisel, *P. flavocostatus* Kreisel, *P. formosanus* Kobayasi, *P. lauterbachii* (Henn.) Kreisel, *P. macrosporus* B. Liu, Z.Y. Li & Du, *P. nanchangensis* Z.Z. He, *P. rubrovolvatus* (M. Zang, D.G. Ji & X.X. Liu) Kreisel, *P. taibeiensis* B. Liu & Y.S. Bau, *P. tenuis* (E. Fisch.) Kuntze, and *P. yunnanensis* (M. Zang & R.H. Petersen) Kreisel (Cunnigham 1931, Boedijn 1932, Kobayashi 1937, Dring & Rayner 1967, Liu 1984, Kreisel 1996, Zang et al. 1998, Hosaka 2010, 2012). *Phallus multicolor* (Berk. & Broome) Cooke and *P. merulinus* (Berk.) Cooke are also native from the Old World, but they have been reported from other areas, probably introduced by man (Reid 1977, Kreisel 1996, Cheype 2010).

To date, eleven phalloids have been reported from Vietnam, being four of them *Phallus* species: *P. aurantiacus* Mont., *P. indusiatus*, *P. multicolor*, *P. rubicundus* (Bosc) Fr. (Kiet 1998). Recently, several xylophilous phalloid specimens were collected in the country and identified as *P. drewesii*, which is a new record for the Asian mycota. Here, we present macro and microscopic description of these specimens, and color photographs.



**Figs 1–2** – *Phallus drewesii* in situ. 1 Unexpanded basidiomata. 2 Expanded and unexpanded basidiomata. – Bars = 1 cm. Photographs are copyright of HungNguyen.

### Materials & Methods

Field expeditions have been carried out in Bidoup Núi Bà (12°00' to 12°52'N, 108°17' to 108°42'E), a Vietnamese National Park with 66,047 hectares. Almost 91% of this area is covered with mostly primary forests of different kinds, including middle-mountain evergreen, coniferous broad-leaved mixed forest, high-mountain dwarf forest, mossy forest, bamboo, savanna and others (<http://bidoupnuiba.gov.vn>). Fungal specimens were photographed in the field, and later were slowly dried in laboratory.

Specimens were examined according to traditional techniques on gasteromycetes taxonomy (Miller & Miller 1988). Colors were coded according to Kornerup & Wanscher (1978) and referred to dry material, unless otherwise stated. Voucher material is kept at Herbaria SGN and ICN (Thiers 2011).

## Results

*Phallus drewesii* Desjardin & B.A. Perry, *Mycologia* 101(4): 545 (2009).

Figs 1–2

Unexpanded basidiomata ovoid to subglobose, 0.3–1.5 cm high × 0.3–0.8 cm diam., pale yellow (4A3) to light yellow (5A4), with brownish (6E4) to dark blond scales (5D4); mycelial strands attached to the base, dirty white, branched, up to 2.7 cm in length. Expanded basidiomata up to 7 cm high; pseudostipe decurved, tapering towards the apex, 2.0–4.6 cm high × 0.2–0.5 cm diam.; surface deeply reticulate, with more or less polygonal reticulations, whitish when fresh, light yellow when dried (4A4); receptacle conical to narrow conical, with a flat tip and a conspicuous pore at the apex (pore up to 0.3 cm in diam.), surface deeply reticulate, dull yellow (3B3) to yellowish gray (3B2) under the gleba. Gleba mucilaginous, olive brown (4F4), fetid.

Basidiospores cylindrical, usually attenuate at one side, 3.2–4.0 × 1.2–1.8 μm, faintly greenish tinted in KOH, smooth, thin-walled. Receptacle and pseudostipe composed of pseudoparenchymatous hyphae, globose, subglobose to irregular in shape, up to 48 μm in diam., hyaline, thin-walled. Volva externally composed of hyaline, interwoven hyphae.

Habitat – lignicolous.

Known distribution – Paleotropical (Desjardin & Perry 2009; present study).

Material examined – Vietnam, Lâm Đồng province, Bidoup Núi Bà National Park, Giang Ly station, growing gregarious on mossy decaying bark, 17 Jun 2013, N.P. Thao, VN-05 (SGN, ICN).

Notes – *Phallus drewesii* is characterized by small gregarious basidiomata growing on rotten wood. The immature forms are ovoid, yellowish to brownish; and mature forms have a whitish, deeply reticulate pseudostipe and receptacle (Desjardin & Perry 2009). Other small xylophilous *Phallus* species found in the Paleotropics are: *P. tenuis*, *P. tenuissimus* T.H. Li, W.Q. Deng & B. Liu, and *P. minusculus* Kreisel & Calonge, but all of them have spongy pseudostipe. *Phallus tenuis* and *P. tenuissimus* are Asian species (Cunningham 1931, Boedijn 1932, Liu 1984, Imazeki et al. 1988, Li et al. 2005) and basidiomata have yellowish pseudostipe and receptacle. *Phallus minusculus* is an African species recently described from Tanzania (Kreisel & Calonge 2002).

In the Neotropics, the only small xylophilous phalloid known to occur is *Xylophallus xylogenus* (Mont.) E. Fisch. (Fischer 1933, Sáenz & Nassar 1982, Gómez & Gazis 2006, Cheype 2010, Trierveiler-Pereira & Silveira 2012), and it can be easily separated from *P. drewesii* due its smaller basidiomata (up to 15 mm high, including the volva) and smooth receptacle. A key to small xylophilous phalloid species was presented by Trierveiler-Pereira & Silveira (2012).

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