



RESEARCH ARTICLE

# *Anthurus brownii* J.M. Mend., (Phallaceae)- A new record of wild caged-phalloid mushroom to the Eastern Ghats of India, new to Indian Mycobiota

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## Abstract

A bizarre-shaped mushroom with an elongated cage-like structure, growing on the red soil with a typical foul smell, was recently collected from Bhubaneswar, Odisha. Detailed macro- and microscopic studies coupled with a literature survey reveal this specimen as *Anthurus brownii* J.M. Mend., an additional record for Indian fungi. This species is reported for first time for the Indian Mycobiota in the present communication.

**Keywords:** diversity; India; macro-fungi; new record; taxonomy

## Introduction

Phalloid macro-fungi are poorly known from the vast geographical area of India as compared to other groups of macro-fungi (1, 2). Among the cage-shaped phalloid mushrooms, the genus *Anthrur* Kalchbr. & MacOw is an important genus which is considered as synonym of *Pseudocolus* Lloyd. but it is entirely different due to the presence of six arms which remain free at the tip. However, in *Anthurus*, these arms remain jointed.

There are 26 species epithets under the genus *Anthurus*, including forma, varieties and names without any taxonomic opinion ([www.indexfungorum.org](http://www.indexfungorum.org)). So far, this species is confined to the restricted localities of Southeast Asia, Philippine and Australia, Queensland (3-6). After perusal of the world wide list and references on Phalleles of India, we conclude this species is unrecorded for the Indian Mycobiota and here we are reporting it for first time along with its detailed description and illustrations from the Odisha state of the Indian subcontinent (7-15).

## Materials and Methods

The morphological characterization was done based on fresh fruiting bodies following the standard methods (3, 4, 16, 17). Photographs of the Basidiomata were taken with the help of a digital camera. The dimensions, form and colour of the taxonomic

characters were recorded in the field and in the laboratory. The samples were kept in formaldehyde for further microscopic examinations in order to infer the important taxonomic features.

For the microscopic examination, freehand sections of specimens were mounted in 5 % KOH and Congo red and Phloxine. After this, the sections were observed under a microscope. Microscopic examination of hyphae/cells and spores with taxonomic significance was done under 40X and 100X objective of Olympus BX-51 microscope equipped with a photographic camera and computer-based image analysis software. Random measurements of 20 basidiospores (length x width), 10 hyphae (width) and 15 pseudo-parenchymatous cells from different parts of the fruiting bodies were taken.

**Basidiomata** up to 190 mm high, annual, humicolous, solitary, delicate, brittle, stipitate, elongated cage shaped in which vertical arms apically may or may not fused and basally ending with short stipe which arises from oval to sub-globose egg in the soil. **Egg** upto 55 mm in diameter, solitary, beneath under the soil, anchored with the help of chalky white and solid hyphal chord ends with numerous branchlets, gradually rupture opens, globose to subglobose, surface glabrous rough and papery thin, chalky white to pale mouse grey when fresh and young becoming ochraceous to pale brown when dried. **Stipe** upto 90 mm high and 40 mm in diameter, cylindrical more or less tapered towards

the base, surface glabrous perforated and rough, hollow centrally with thin walled, chalky white when fresh becoming ochraceous when dried. **Arms** 6 in nos. up to 70 mm high and 10 mm in diameter, almost triangular, two side outer facing surface glabrous, perforated and rough while third side inner facing surface parallel sulcate, pale pinkish buff when young becoming ochraceous on drying; arms internally chambered which gives spongy texture, concolorous with outer surface. **Gleba** sticky, greyish brown.

**Basidiospores** 4-5 x 2-3 μm, ellipsoid, thin-walled, smooth, hyaline, acyanophilic and inamyloid, abundant. **Hyphae** 2-5 μm wide, clamped septate, infrequently ampullate and wide upto 10 μm, branched, forming H-connection, thin to thick-walled (wall upto 1 μm thick) smooth, hyaline; mostly forming the egg wall. **Pseudo-parenchymatous cells** 5-45 x 3-35 μm, oval to cylindrical

to variously shaped, thin to thick-walled (wall upto 3 μm thick), smooth, hyaline; mostly forming stipe and arms (Fig. 1).

#### Ecology

Uncommon in the study areas, solitary, in association with the shrubs like *Chromolaena odorata* (L.) R.M. King & H. Rob., *Justicia japonica* Thunb., *Mimosa pudica* L., the litter-covered clay or sandy soil in moderately shady places along with the shrubs population of the area and also seen in local bamboo vegetation.

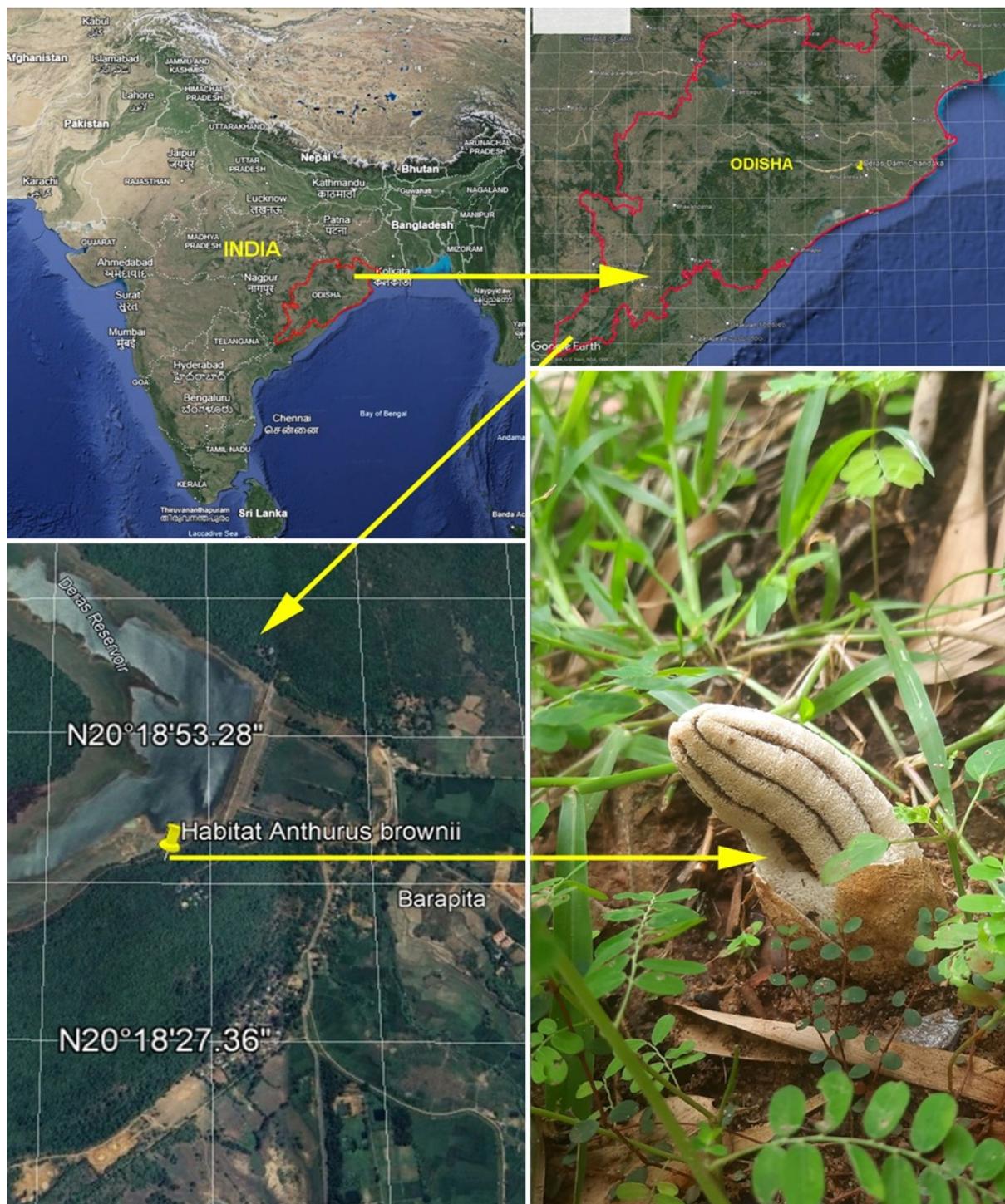
#### Distribution

Recorded from India, Southeast Asia, Philippine and Australia Queensland (Fig. 2) (16, 17).



**Fig. 1.** A. Habitat; B. Vertical section of egg; C & D. Habit; E. Hyphae; F. Pseudo-parenchymatous cells; G. Basidiospores.

Scale bars: D-G = 10 μm.



**Fig. 2.** Distribution map of *Anthurus brownii* along with habitat.

### Specimen examined

India, Odisha, Chandaka Road, Bhubaneswar, Chandaka near Deras Dam (on soil with litters), 20°18'36.94"N 85°41' 26.92" E, 273 ft altitude 15-08-2023, Malay Prithwiraj Sahoo and Prabhat Kumar Das, CAL (2012).

### Conclusion

So far as its generic identity is concerned which is based on the internal structure of the arms and it must be chambered as the spongy texture appearance (3, 15, 16). It is in full conformity in our specimen which leads its identity as *Anthurus* rather than tubular in the case of *Pseudocolus* Lloyd. Our collection is similar with the earlier macro-morphological descriptions (3, 4, 16, 17).

However, in earlier descriptions microscopic details were not provided in detail and in the present communication, detailed microscopic characterization is being given for further detailed taxonomic information.

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## Authors' contributions

All authors have contributed equally. All authors read and approved the final manuscript.

## Compliance with ethical standards

**Conflict of interest:** Author do not have any conflict of interest to declare.

**Ethical issues:** None

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