Species

First Report of *Podaxis pistillaris* (L.), a macrofungi from Mahanadi River areas, Cuttack, Odisha, India

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ABSTRACT

A significant finding has been made on the macrofungal diversity of Odisha state, India, with the identification of *Podaxis pistillaris* (L.) as a new record. This species was found growing near the Mahanadi River area of Cuttack, Odisha. To aid in accurate identification and documentation, this report includes a detailed description and photographs of the species. The present finding contributes to the extension of the known geographical range of *Podaxis pistillaris*, highlighting the importance of continued exploration and documentation of fungal diversity in the Mahanadi River areas of Odisha state.

Keywords: New distribution, fungal diversity, Mahanadi River, Odisha

1. INTRODUCTION

In the month of April, 2025, the team members of Ambika Prasad Research Foundation was working on floral diversity of Mahanadi River areas of Odisha state. During the survey, in a rainy day, the team observed a mushroom belonging to the family Agaricaceae and genus *Podaxis*. After morphological observation, it was identified as *Podaxis* pistillaris. The Agaricaceae family is a large and varied group of fungi, featuring a wide range of mushrooms with edible, medicinal, and toxic properties. With around 85 genera and 1340 species, this family showcases significant diversity in morphological characteristics, such as spore color and structure (Fallal et al., 2019). *Podaxis* is a genus of this family. *Podaxis* was initially described by Linnaeus in 1771. Since then, about 25 species of *Podaxis* were almost entirely reduced into one species i.e., *Podaxis pistillaris* (Conlon et al., 2019). It has a wide distribution and found in desert soils of arid and semi-arid regions globally, including countries such as Afghanistan, Africa, Argentina, Australia, Brazil, China, Iran, Mexico, South Africa, Qatar, Yemen, USA and India (Muhsin et al., 2012). The species are also found worldwide, thriving in various ecosystems, including grasslands, and riparian ecosystem. In India, it has been reported from Assam, Jammu & Kashmir, Madhya Pradesh, Rajasthan, Haryana, Punjab, Chandigarh, and Maharashtra. The global habitat of *Podaxis* is dry, sandy and habitats near ephemeral water sources or on mounds of grass-harvesting termites. Earlier studies suggested that the production of

fruiting bodies requires good availability of moisture. Although there is a low nutrient availability and large temperature fluctuations outside, fruiting bodies of *Podaxis pistillaris* are often reported shortly after rainfall or near river systems, which are supported by various aquifers just below the soil surface. Reports showed that *Podaxis* can grow optimally at 40ºC which also shows a wide environmental adaptation. Again, the species is known for its food and therapeutic potential (Davila 2017; Mridu and Atri 2017).

2. METHODOLOGY

During the floral diversity of Mahanadi River areas in Cuttack district, the team APRF (Ambika Prasad Research Foundation) observed a unique mushroom on 30th April 2025. After morphological observation and literature study (Sharma and Sharma, 2012; Kumar et al., 2022; Awan et al., 2022; Sethi et al., 2024), it was identified as *Podaxis pistillaris* (Figure 1).

The herbarium specimen was prepared and deposited at Herbarium unit, Ambika Prasad Research Foundation, Odisha, India (Kulkarni et al., 2023).

3. RESULTS AND DISCUSSION

After a critical study on the morphology of the collected specimen, it was confirmed as *Podaxis pistillaris* (Sharma and Sharma, 2012; Kumar et al., 2022; Awan et al., 2022). The literature survey revealed that it is a first report from the Odisha state (Rout and Kumar, 2019; Mishra et al., 2021; Sethi et al., 2024). The details about the taxonomy, morphology and ecology are discussed below.

Taxonomic Treatment

Podaxis pistillaris (L.).

The macrofungi are capped and stipitate. Height of 7.5 -10 cm in height. Cap elongated, cylindrical, 4.5-5.0 cm length and 2-4 cm across, white to pale brownish, shaggy to scally, dry rigid; Peridium 3.0-7.0 cm in length, 2.0-3.0 cm in across; Exoperidium smooth to scaly flanking to reveal the endoperidium. Endoperidium lacerates, dehiscent at maturity from lower edge and splits exposing the spore mass dispersed by wind. Capillitium is yellowish-brown and deep red when mature. Spores are initially white to golden and later brown, dark brown to black powder. Immature spores are sticky. Lower capillitium near the base mature first and towards to apex. Stipe straight 4.5 – 7 cm long, up to 1 cm across, arduous, woody, coarsely fibrillose, whitish to pale brown and without ring. Basidiopores oval to subglobose (Figure 1).

Specimen examined

Podaxis pistillaris (L.).

India, Odisha, Cuttack, Mahanadi River area, N 20º46'10.55", E 85º76'38.16", 43 m MSL, 30 April 2025, R.S Devi 165 (Herbarium of Ambika Prasad Research Foundation; Figure 2).

Ecology and habitat:

It was grown single or scattered in a sandy soil near Mahanadi River, Odisha.

Note:

No distinctive odor.

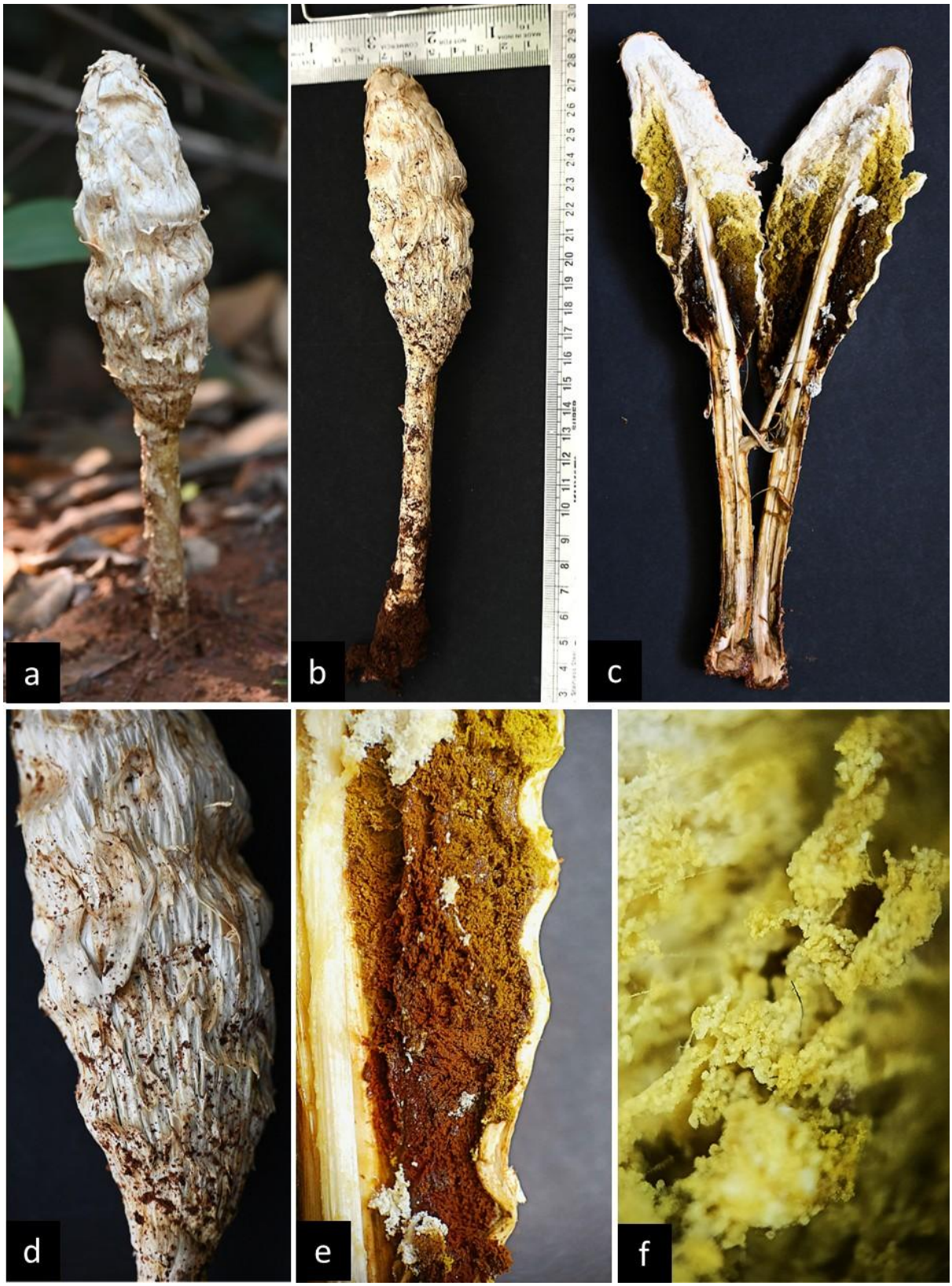

Figure 1: *Podaxis pistillaris*: a) Habitat b) morphological analysis c) dissection of the specimen d) Scaly flanking exoperidium e) spores bounded by peridium f) spores under 100 x lens

Figure 2: Herbarium specimen of *Podaxis pistillaris*

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Conflict of Interest
The authors declare that there are no conflicts of interests.

Informed consent
Not applicable.

Ethical approval & declaration
In this article, as per the plant associated macrofungi regulations followed in the Ambika Prasad Research Foundation, Odisha, India; the authors observed the *Podaxis pistillaris* (L.), a macrofungi from Mahanadi River areas, Cuttack, Odisha, India. The ethical guidelines for plant materials (plant associated macrofungi) & National Biodiversity Authority Guidelines for macrofungi are followed in the study for observation, identification & experimentation.

Data and materials availability
All data associated with this study are present in the paper.

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