

Research Article

PODAXIS PISTILLARIS REPORTED FROM MADHYA PRADESH, INDIA

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ABSTRACT

A basidiomycete collected from Sihora, District Jabalpur is described and illustrated. The fruiting bodies and spores showed variations however, match with the description of *Podaxis pistillaris*. This is first report of the fungus from Madhya Pradesh, India.

Key Words: *Comatus*, *Agaricaceae*, *Lycoperdaceae*, *Food*, *Medicinal*

INTRODUCTION

Sihora road railway station is situated in Jabalpur district of Madhya Pradesh about 17 kilometers south west from Karaundi the center point of India. Its geographical co-ordinates are 23° 29' North and 80° 70' East. Some cylindrical fruiting bodies were incidentally seen on disturbed soil of filling of a pond beside the road going towards Khitola bus stand from railway station. The fungus was initially identified as *Coprinus comatus* (O. F. Mull.) Pers. Later it was identified as *Podaxis pistillaris* (L. Pers.) Morse. This fungus is commonly known as False Shaggy Mane due to its resemblance with *C. comatus*. This species has previously been described and synonymised by few workers (Massee, 1890; Morse, 1933, 1941; Keirle *et al.*, 2004; Drechsler- Santosh, 2008). *Podaxis pistillaris* earlier has been reported from various parts of India (Bilgrami *et al.*, 1979, 81, 1991; Jamaluddin *et al.*, 2004). But *hitherto*, it has not been recorded from Madhya Pradesh (Khatri *et al.*, 2009). Medicinal properties of this fungus have well been documented for the treatment of inflammation (Mao, 2000), skin diseases (Gupta and Singh, 1991) and as antimicrobial agents (Panwar and Purohit, 2002). Although the edibility and nutritive values of this mushroom have been tested (Gupta and Singh, 1991), yet not commercialized as a food supplement due to hard nature of the fruiting body.

MATERIALS AND METHODS

Morphological characters of the fruiting bodies like size, shape, color and surface were noted on the field. Longitudinal as well as transverse sections of fruiting bodies were taken with help of a new sharp blade and internal characters were recorded. The photographs of different stages of basidioma were taken with help of a digital camera of 10 pixels. A piece of gleba of different stages of development was put on separate microscopic slides, dissected with the help of dissection needles and mounted in water. Simultaneously duplicates were stained in cotton blue, mounted in Lactophenol and sealed with feviquick. Microscopic characters of fungi were carefully observed and photographs were taken by digital camera attached to microscope eye piece. The species was identified after careful perusal of literature (Morse, 1993; Keirle *et al.*, 2004). Specimen and slides have been deposited in Government Shyam Sunder Agrawal College, Sihora as *Podaxis*/USP/2009.

RESULTS

Podaxis pistillaris (L. Pers.) Morse: *Mycologia* **25**: 27, 1933.

(Figures A-P plates 1-4)

Fruiting body: fragile, leathery, woody at maturity, stipitate and pileate, odorless.

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FIGURE – 01

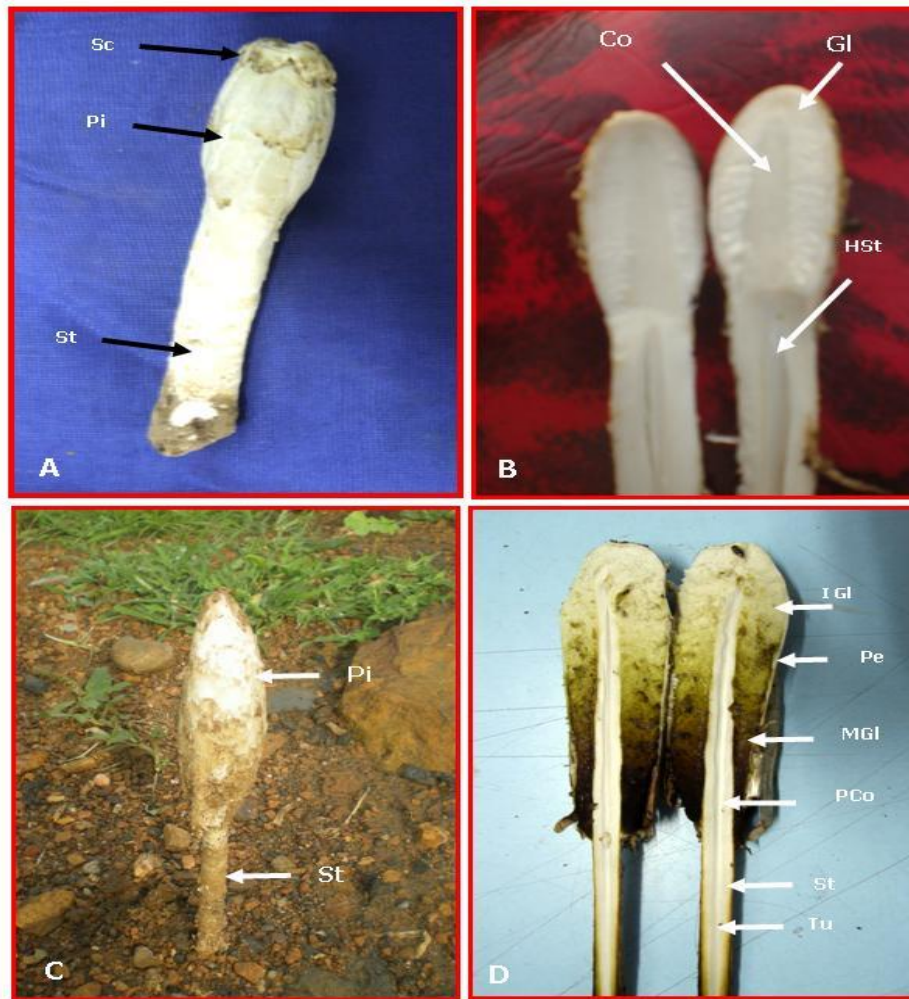


Figure 1: A to D

- A Young basidiocarp, close up view
- B L.S. of young basidiocarp
- C Maturing basidiocarp
- D L.S. of maturing basidiocarp

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FIGURE – 02

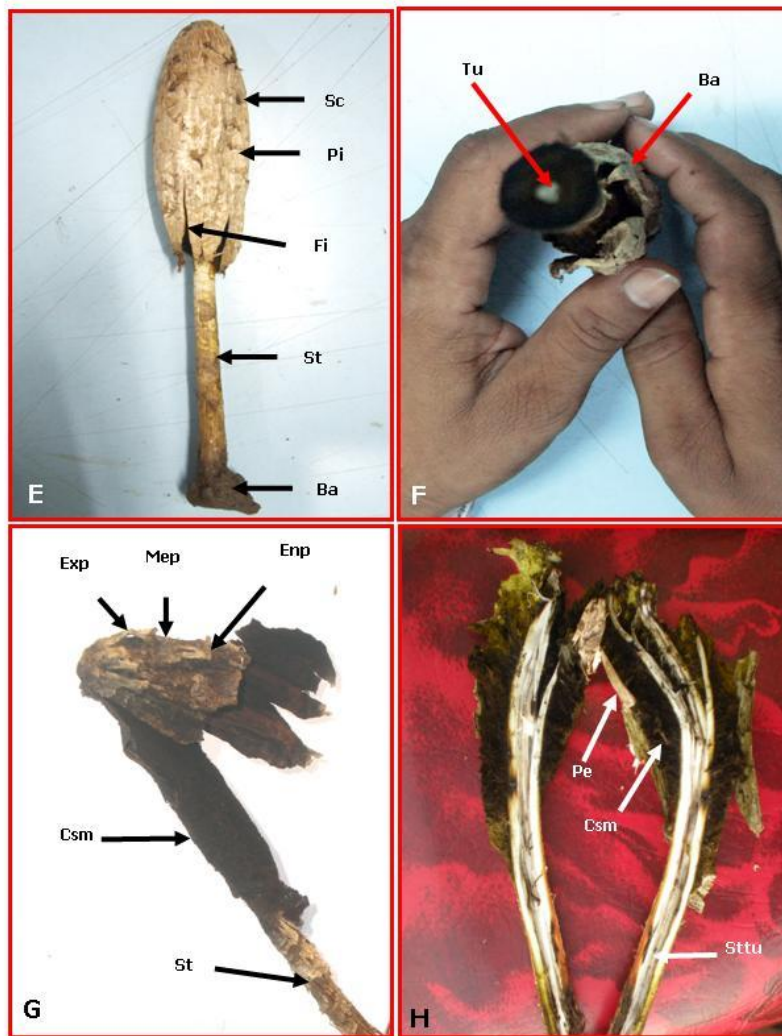


Figure 2: E to H

- E Mature basidiocarp
- F T.S. of stipe of mature basidiocarp at base
- G Over mature basidiocarp with peridial remnants
- H L.S. of over mature basidiocarp with peridial remnants

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FIGURE – 03

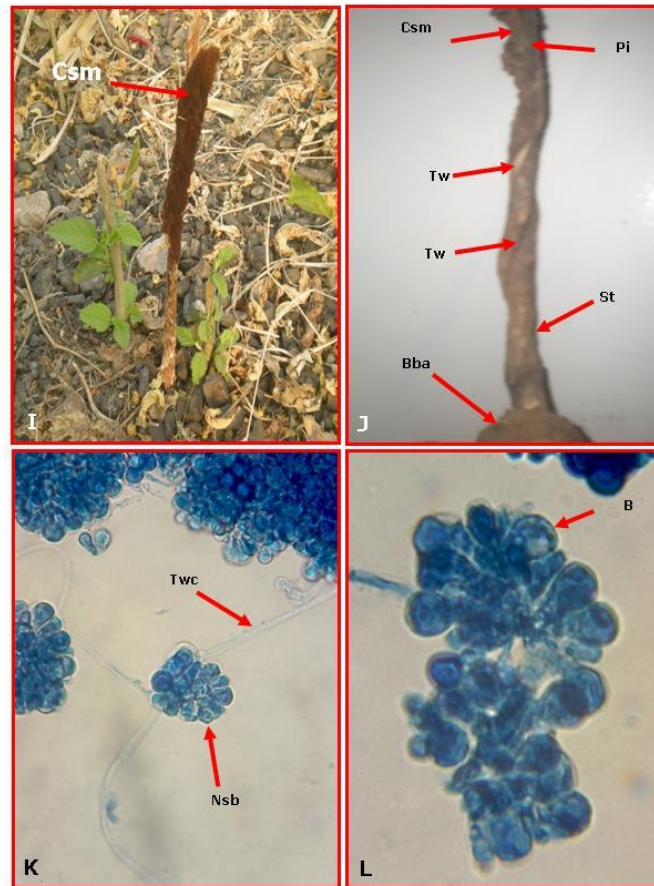


Figure 3: I to L

- I Over mature basidiocarp peridium blown away
- J Stipe with bulbous base and twists
- K Clusters of basidia
- L A cluster of basidia enlarged

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FIGURE – 04

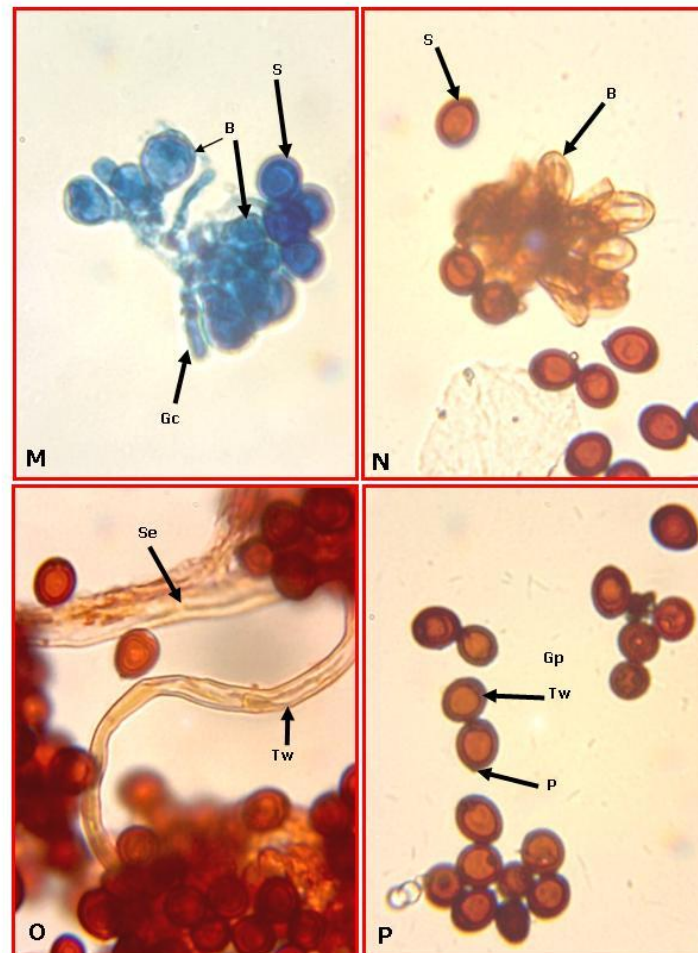


Figure 4: M to P

- M A cluster of basidia with attached spores
- N Degenerating matured basidial cluster
- O Thick walled capilitial thread and spore mass
- P Mature spores

(**Abbreviations:** Ba = Base; B = Basidia; Bba = Bulbous base; C = Capilitium; Csm = Capilitium spore mass; Co = Columella; Enp = Endoperidium; Exp = Exoperidium; Fi = Fissure; Gl = Gleba; Gc = Generative capilitium; Gp = Germ pore; Hst = Hollow stipe; Igl = Immature gleba; Mgl = Mature gleba; Mep = Mesoperidium; Nsb = Nonsterigmate basidia; P = Papilla; Pe = Peridium; Pco = Percurrent columella; Pi = Pileus; Sc = Scale; S = Spore; Sw = Spore wall; St = Stipe; Se = Septum; Tw = Thick wall; Tu = Tunnel; Twc = Thick wall capilitium; T= Twist).

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Pileus: Narrowly cylindrical to ovovate, 2 – 5 cm wide at centre and 7 – 10 (16) cm long at maturity, not expand like an umbrella; the margins fused with the stipe when young but separate from it at maturity; peridium 3 layered: outer layer membranous 1 -2 mm thick, shining white initially, cream - grey at maturity, separates as scales middle layer about 1 mm thick, membranous, brittle, some sloughs off longitudinally from base towards apex while other remain attached to the inner layer; inner layer fibrous, brittle, glabrous, white cream to grey which eventually get partially or completely fissured or cracked from the base where it join the stipe columella juncture towards apex in longitudinal manner exposing gleba ultimately disposed off by wind exposing capilitium – spore mass. The hymenium is borne on irregular but recognizably lamellate tramal plates which breakdown following the development of the capilitium; Gills replaced by gleba, at first white, changing from white to pallid, pallid to yellow, yellow to brown ultimately blackish; maturation starts from base progressively towards apex; Capilitium interwoven in which spores mass is embedded; Cheilocystidia and Pleurocystidia not observed; Basidiospores producing tissues (hymenophore) composed of interwoven, hyaline, thin walled generative and skeletal like hyphae 4 -20 μ m thick, giving rise to large clustures of brachybasidia or basidioles, Basidioles: ovovate to elliptic 10 – 20 X 10 -20 μ m. Clamp connections not observed; Basidiospore: elliptic, oval, spherical, 7 -12 X 11-16 μ m, hyaline when young turning to pale- yellow to olivaceous ultimately brown, blackish in mass, smooth with a prominent germ spore, rarely papillate, cell wall two layered, produced 4 or more in number per basidiole. The gleba is traversed by a slender, gradually tapering, permanent columella otherwise it is homogenous at maturity.

Stipe:- 4 – 10 (17) cm long, 10-12 mm thick at the base just above ground level, gradually tapers to 4-5 mm at the apex, continuous with the columella, slender, tough with a bulbous base, dry, woody, fibrous, striate, white sometimes covered with membranous scales, hollow throughout the length, tunnel or siphon 2-2.5 mm in diameter, stipe mycelium thin and thick are mixed, swollen here and there, parallel to long axis, blackish near ground level while white in rest part of stipe, turning yellowish after 10-15 hours of stipe cutting due to reaction with air but those lining the tunnel remain white; at maturity when stipe dries it becomes brownish in color and usually twists 1-3 times clockwise or anticlockwise; persistent bulbous base solid, 1 -1.5 cm in diameter; Annulus and volva absent. Taste of the mushroom not tested.

DISCUSSION

Fruiting bodies produced in the month of July were larger while those produced in the month of October were comparatively smaller. Variations in fruiting bodies color, shape and size were observed to the extent that fruiting bodies belong to entirely different species but we put all specimens in the same species *Podaxis pistillaris*, following Morse (1933) comment that this species has great variations in fruiting bodies and spores characters. The site from where this fungus was collected has been covered by cement concrete level to make scooter/cycle stand in 2011. The dried material has also been preserved for further reference in microbiological laboratory of Jabalpur Institute of Nursing Science & Research Jabalpur, Madhya Pradesh, India. Two mature fruiting bodies were dispersed in Botanical garden College Campus Sihora and near Division of Forest Pathology, TFRI, Jabalpur for *in situ* and *ex situ* conservation respectively. Mycelium from the fruiting body as such preserved in freeze over 3 months failed to regenerate in PDA culture media. It has seldom been observed that spores are produced by budding of the basidioles in fruiting bodies collected from the field.

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