

Research Article

An account of *Chlorophyllum molybdites* and *Macrocybe lobayensis* mushroom species from drought prone area of Naldurg, Osmanabad district of Maharashtra, India

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Abstract: The present article reports the analysis of *Chlorophyllum molybdites* and *Macrocybe lobayensis* mushroom species were described morphologically, ecological characters, illustrated and discussed based on collections from Naldurg, Osmanabad district of Maharashtra.

Keywords: Wild poisonous and edible mushroom, Agaricaceae, Tricholomataceae, Naldurg.

INTRODUCTION

Mushrooms are highly valued for their utilization as foods. Mushrooms are a good source of bioactive components, minerals and have been traditionally consumed across the globe for maintaining health. Mushrooms can be defined as macrofungi having hypogeous or epigeous distinctive fruiting bodies, which can be seen with the unaided eye and to be picked by hand (Chang and Miles, 1992). According to Hawksworth (1912) at present there are approximate 3 million fungi of which only 140,000 species produce fruiting bodies of sufficient size and suitable structure to be considered as mushrooms. Gilled mushrooms are a morphologically visible and not a taxonomically clear group and hence they belong to several orders of the Class Agaricomycetes of the Phylum Basidiomycota (Farook *et al.*, 2013). Mushroom offers to proteins, sugars, glycogen, lipid, vitamins, amino acids and crude fiber, mushrooms possess some essential mineral nutrients which are considered as key factors for the normal functioning of the body (Gbolagade, 2006; Kalac, 2011).

Therefore in the present article two species *Chlorophyllum molybdites* and *Macrocybe lobayensis* are reported from the first time from Deccan Plateau Zone of India (Naldurg, Osmanabad district of Marathwada region in Maharashtra

MATERIALS AND METHODS

Study Area

Study sites Naldurg comes under the Deccan Plateau Zone of India in Osmanabad district of Marathwada region in Maharashtra state. It has an average elevation of 566 meters (1856 feet). The study site is located at 17.49°N Latitude, 76.16°E Longitude, with an altitude of 509 m. This area lacks natural resources and is prone to drought, rocky and dry with low and uncertain rainfall, therefore the objectives of this study was to ascertain the status of macro fungi.

Collection and Identification

Photographs were taken in their natural habitat using Sony Steady Shot DSC-W310 digital camera, geographical ranges were recorded using GPS system and field notes were taken with respect to their morphological characters and collected without damage to whole body and brought to laboratory for further analysis. Collected macro fungal specimens were systematically analyzed and identified previous literature and standard taxonomic methodology (Singer, 1986; Pegler *et al.*, 1998) and macro & microscopic morphological examination of tissues was made from free hand sections rejuvinated in 10% KOH and stained with 5% trypan blue and examination was made directly using the binocular research microscope 400X (Lawrence and Mayo LM-52-3521). Basidiospores were examined and measurements were taken. Scientific names were authenticated and

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confirmed according to index fungorum database (www.indexfungorum.org), mycobank (www.mycobank.org). The specimens of macro fungi (ASCNM-1 and ASCNM-2) were deposited at department of Botany, Arts, Science and Commerce College Naldurg, district Osmanabad.

RESULTS AND DISCUSSION

Taxonomic description *Chlorophyllum molybdites* (G. Mey) Masee: =*Lepiota molybdites*

Chlorophyllum molybdites is a widespread mushroom belongs to family Agaricaceae and has commonly called false parasol and vomiter. Fruiting body with large basidiocarp is developed with rhizomorph. When it matures, easy to differentiate from other mushrooms based on large cap, ring, greenish colour of gills and green spores. Pileus is 5-30 cm wide; oval, then broadly convex to flat; dry; white with buff patches on center when young, then white with light brown scales; soft and flesh white reddish brown in button stage often bruises reddish brown further. Gills are free, close, and broad, white becoming grayish to greenish. Stipe **with thick movable ring** and have 5-25 cm long, 1-2.5 cm thick at apex, enlarging at base; smooth; white, discoloring brownish Ring: double-edged, often movable. Basidia are 28.11-36.9 x 11.5-14.9 μm . Basidiospores size are 10.1-12 x 6.5-9 μm , elliptical, thick-walled with apical pore, smooth, greenish dextrinoid (Fig.1).

Location:

The study site is located at 17.49°N Latitude, 76.16°E Longitude, with an altitude of 477 m, temperature- 21.1 °C, roadside, date- 28th August 2018.

Chlorophyllum molybdites is highly poisonous and producing severe gastrointestinal symptoms of vomiting and diarrhea. Kimbrough (2000) reported that *C. molybdites* is one of the largest and common mushroom found in lawns of the southeastern United States, Florida. It is commonly known as the 'green gill' and is relatively easy to distinguish from other mushrooms due to a combination of its distinct green spore print, the greenish color of its gills, its large whitish cap and the ring around its stem (Bessette *et al.*, 2007). It was observed as solitary mushrooms or forming complete or incomplete "fairy rings" in lawns, grassy areas and open woods and often forms "fairy rings" in large circles and semi-circles on lawns. Consumption of *C. molybdites* causes severe gastrointestinal problems such as stomach irritation, vomiting and diarrhea. In severe cases the person may affect bloody diarrhea and hypovolemic shock (Berger and Guss, 2005). Eilers and Nelson (1974) suggesting

that cooked *C. molybdites* are less toxic than fresh mushrooms. Previous workers reported this species *C. molybdites* (Florence & Yesodharan, 2000, Vrinda & Pradeep, 2011). In Asia green spored *Chlorophyllum* is apparently consistently considered poisonous (Chang and Xiaolan, 1995; Imazeki *et al.*, 1988; Bijeesh *et al.*, 2017). It was also been reported from other tropical regions, like Brazil, the Philippines, Tahiti, Central Africa and across Central America and the Caribbean region (Zoberi 1972). Kuo (2015) reported that *C. molybdites* could be found during spring, summer and other species produces more mushrooms during wet weather in Florida.

Macrocybe lobayensis* (R. Heim) Pegler & Lodge, comb. nov. = *Tricholoma lobayense

This is an edible mushroom and belongs to family Tricholomataceae. Pileus 19.5cm diam, soft & fleshy, convex to applanate; surface pure white, glabrous, smooth finally cracking; margin lobate. Lamellae adnate to sinuate, cream-color with pale pink, narrow, up to 3 mm broad, edge entire. Stipe with recurved squamules and have 5-14.5 x 1.5-3 cm in diameter, cylindrical or obclavate with a swollen base, often discolored pale gray, glabrous; arising from a buried pseudosclerotium. Context thick up to 2cm, pure white, unchanging, firm-fibrillose; consisting of very thin-walled hyphae, 2-5 μm diam, inflated to 12 μm diam, with clamp connections; odor of coumarin or 'bitter almonds'; taste farinaceous. Spores 5.5-6.7 x 3.5-4.3 (5.8 \pm 0.2 x 3.8 \pm 0.2) μm , ovoid to broadly ellipsoid, hyaline, thin-walled, containing a single, Basidia 27-32 x 4-6 μm , narrowly clavate, bears four sterigmata, with a basal clamp connection. Lamellar edges are fertile; cystidia none. Hymenophoral trama is regular, hyaline, with thin-walled hyphae (2-8 μm diam. Sub-hymenial layer 8-10 μm wide, interwoven. Odor is strongly cyanic, coumarin or 'bitter almonds'; in grass (Fig.2).

Location:

The study site is located at 17.79°N Latitude, 76.27°E Longitude, with an altitude of 454 m, temperature -15.4 °C, farm field, date-10th Oct 2018.

Macrocybe lobayensis was originally described from the Central African Republic and recent collections received at Kew have confirmed further records from the Ivory Coast, Ghana and Nigeria (Pegler *et al.*, 1998). *Macrocybe* species are distributed worldwide and reported from West Africa, India (Jabalpur, Madhya Pradesh; Tamil Nadu; Thiruvananthapuram (Anandh and Prakasam, 2002; Vrinda and Pradeep, 2006; Mohanan, 2011).



Fig.1: *Chlorophyllum molybdites*, A-habit in field, B-fructing body with rhizomorph, C-size of pilus, D- free gills, E- Basidia, F-Basidiospores

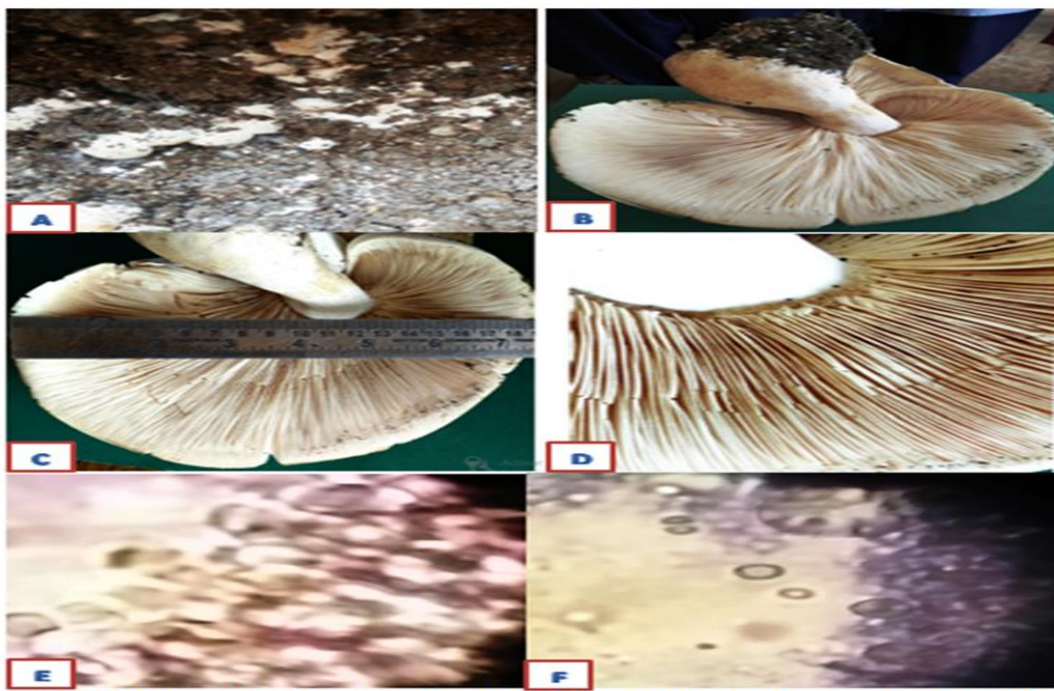


Fig.2: *Macrocybe lobayensis*, A-habit in field, B-fructing body with rhizomorph, C-size of pilus, D- free gills, E- basidia, F-gill edges

CONCLUSION:

Study concluded that the wild species mushrooms are edible and poisonous, therefore accurate identification is needful. Thus the edible mushrooms produced natural bioactive compounds. Hence cultivation is essential by using agro waste materials in further studies.

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