

## The four new species of Myxomycetes of South-East Maharashtra, India

Tembhurne R.R.<sup>1\*</sup>, Nanir S.P.<sup>2</sup>, Nasarin S.<sup>2</sup>

<sup>1</sup>Sangola College, Sangola, District Solapur, India. <sup>2</sup>Government Institute of Science, Aurangabad, India.

\*Corresponding author: ramesh\_tembhurne@rediffmail.com

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### ABSTRACT

**Background:** Myxomycetes are the true slime-moulds. They are mostly used in the management of breast and brain tumours. **Aim:** This is the floristic study of South-East Maharashtra (India) comprising four district, Solapur, Satara, Sangli and Kolhapur districts, very rich in biodiversity to analyse flora from this said area. **Methods:** Present study is a floristic exploration from the region, to collect large number of sample of myxomycetes, to visit different locality for collection of species of myxomycetes, and preservation in empty box which very suitable, convenient and easy to handle to prepare proper size tray. **Result:** Species of myxomycetes were identified and described. *Lepidodermopsis* Hohnel., with two species, *Lepidodermopsis leonina* (Berk. & Br.) Hohnel, characterized by limeless and fluted stipe; *Lepidodermopsis martinii* Lakhanpal characterized by scattered nature of fruiting. *Physarina* Hoehn., with a single species, *Physarina echinospora* Thind & Manocha fructification sporangiate, stipitate to subsessile, and *Comatricha* Preuss., with a single species, *Comatricha aequalis* Peck which lacks nodding sporangia. **Conclusion:** All species are being reported for the first time in this region. Further exploration should be done to identify species in various locations. This will contribute to the management of cancers.

### INTRODUCTION

The Myxomycetes (the true slime-moulds) are organisms which possess an assimilative phase of free living, multinucleate, mobile mass of protoplasm called as the plasmodium like amoebae, and a sporulating phase consisting of a mass of spores typically borne in a simple or complex membranous or tough,

non-cellular spore case like fungi.<sup>[1]</sup> In addition to it, often there is a system of free or netted threads called as a capillitium or pseudocapillitium.<sup>[1]</sup>

The myxomycetes are widely distributed, found frequently where dead or decaying organic matter is abundantly present.<sup>[2]</sup> They feed by phagocytosis on living bacteria, fungal spores,

pollen grains, mycelial fragments and bits of organic matter. The nutrition is typically holozoic.<sup>[1]</sup> Certain discovery shows that some species like *Trichia favoginea* and *Didymium bahiense* have antibiotic and antimicrobial activities, and cytotoxic to cancer cells.<sup>[3]</sup>

South-East of Maharashtra constitute the districts Solapur, Satara, Sangli and Kolhapur. Since myxomycetes have great biomedical potentials, it became pertinent for us to identify and describe the various species of myxomycetes in the study area.

## METHODOLOGY

This study is based on myxomycetous floristic exploration in the study region. A large number of myxomycetes specimens along with their natural substrates were collected. Frequent visits were made to different localities. Empty cigarette boxes were used for the preservation of specimens. These boxes were readily available and cheap. Paper trays of the proper size were prepared to get it fit inside the box tray.<sup>[4]</sup>

The natural substrates were cut into suitable sizes and glued to the centre of the paper tray.<sup>[3-5]</sup> Each box was provided with field notes of respective specimen.<sup>[3-5]</sup> Accession number was written on the specimen box and on the paper tray, and entered in accession register.<sup>[4]</sup> The specimen boxes were stored in 'generic' boxes provided with naphthalene ball to prevent insect entry after the registration.<sup>[4]</sup>

In rainy seasons, the collected specimens were dried in the incubator or an oven at 40°C. Artificial drying sometimes leads to the shrinkage of weak and flaccid stalk, hardening of wet sporangia and cracking of peridium.<sup>[4]</sup> All the specimens were identified and confirmed as documented by previous studies.<sup>[1,5-7]</sup>

## RESULT AND DISCUSSION

### 1. *LEPIDODERMOPSIS LEONINA*

Fructification sporangiate, stipitate, rarely sessile, scattered to gregarious, pearly white to ochraceous white, sometimes two sporangia fused, 0.72-1.6 mm tall. Sporangia globose, umbilicate below, 0.35-1.1 mm in diam. Stipe

thick, stout, cylindrical, broader at the base, vertically rugose, deep orange to reddish brown, 0.35-0.95 mm long. Hypothallus prominent, more or less rotate. Peridium thick, single, cartilaginous, dark brown, shining; dehiscence irregular along the ridges, upper part floccose. Columella globose, dome shaped, clavate, pedicellate. Capillitium radiating from columella and attached to peridium, profuse, filamentous, stiff, wavy. Spores black in mass, violaceous brown under transmitted light, globose, 8.5-10 µm in diam., uniformly warty or spinulose, warts arranged in small curved lines.<sup>[7]</sup>

Collection examined: RRT / 8197, 8205, 8208, 8218, 8220, September, 2003; 8035, August 2005, Panhala; 8200, 8202, 8209, September 2004, Radhanagari, District Kolhapur. On dry leaves, dead decaying wood of angiospermic plants and grass leaves and stem.

Distribution: India: *Lepidodermopsis martinii* Lakhanpal is close to *L. leonina*<sup>[7-10]</sup> However former is differentiated in its larger, limeless and fluted stipe; nonlimy hypothallus; peridium and capillitium ochraceous brown; larger and strongly warty spores, which are papillate with thinner and paler on one side.<sup>[7]</sup> Earlier worker<sup>[6]</sup> treated *L. leonina* under *Didymium* as a *D. leoninum*. The species is distinguished by its robust fruiting, cartilaginous shining peridium with large spiny crystals breaks into more or less uniform polygonal platelets; columella stipitate and shining.<sup>[7]</sup>

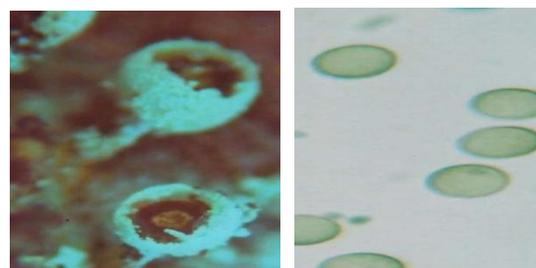


Figure 1: *Lepidodermopsis leonina*

### 2. *LEPIDODERMOPSIS MARTINII*

Fructification sporangiate, stipitate, scattered to gregarious, snow white to white, 0.63-1.7 mm tall. Sporangia globose, 0.38-1.0 mm x 0.34-0.97 mm in diameter. Hypothallus distinct, rotate, brown, thin, membranous, nonlimy.

Stipe cylindrical, stout, broader at the base, vertically rugose, dark reddish brown, 0.29-1.1 mm long. Peridium single, thick, cartilaginous; dehiscence along the ridges, breaking into platelates. Columella globose, hemispheric, orange brown. Capillitium profuse, radiating from columella and attached to the peridium, spore-mass black, violaceous brown under transmitted light, globose, 10-11.1  $\mu\text{m}$  in diameter, warted.<sup>[7]</sup>

Collection examined: RRT / 8223, 8263, Aug.-2004, Pachagani, District Satara; 8201, September 2003 ; 8207, 8219, September 2004, Radhanagari, District Kolhapur. On dry leaves of angiospermic plants.

Distribution: India: *L. martinii* Lakhanpal species is characterized by scattered nature of fruiting; presence of cartilaginous peridium marked by yellow lines of dehiscence together with white lime crystals on the peridium; ochraceous brown hemispheric columella; larger apiculate spores with compression ridges, however spore wall on one side and warts in subreticulate arrangements.<sup>[7-11]</sup>

Population described in the present work differs from type description in its more or less cylindrical stipe; stiff capillitium, with many calcified vesicles. *L. martinii* Lakhanpal can be compared with *L. leonina* Lakhanpal. However, later is marked by the sporangiate fruiting, the peridium and capillitium are ochraceous brown, though the latter bears numerous black swellings at places ; the stipe is long, non-calcarious, fluted and deep reddish brown, the hypothallus is membranous and non-calcarious, the spores are larger and more prominently warted.<sup>[7]</sup>

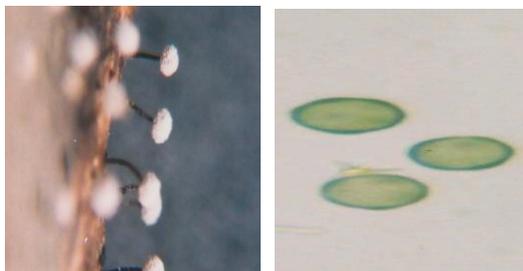


Figure 2: *Lepidodermopsis martini*

### 3. *PHYSARINA ECHINOSPORA*

Fructification sporangiate, stipitate to subsessile, scattered curdy white, 0.34-0.85 mm in total height. Sporangia globose, umbilicate below, 0.32-0.72 mm long, 0.38-0.89 mm in diameter. Stipe short, stout, cylindrical, creamy white, vertically rugose, 0.12-0.42 mm long, 0.17-0.34 mm thick. Hypothallus concolorous to stipe, rotate. Peridium single, dehiscence along the ridges, upper part separate, basal part remain persistent. Columella globose, subglobose or clavate, white reddish brown to pinkish. Capillitium abundant, radiating from columella and attached to the peridium, Spore black in mass, deep violate brown under transmitted light, globose to oval, 9.7-13.8  $\mu\text{m}$  in diam. with prominently spiny.<sup>[12]</sup>

Collection examined: RRT / 8039, August 2003; 8024, 8110, 8112, 8419, September 2003, Panhala, district Kolhapur. On dry leaves of angiospermic plants.

Distribution: India: In the type description, equatorial ridge is not mentioned. However this character has been established throughout the cultural study.<sup>[2,4,8,9,11,13,14]</sup> Populations observed in this work show equatorial ridge as consistent character.



Figure 3: *Physarina echinospora*

### 4. *COMATRICHA AEQUALIS*

Fructification sporangiate, stipitate, scattered to densely clustered, dark brown to violet brown to almost black, 3.4-3.6 mm in total height. Sporangia falcate, cylindrical, broader at the base, tapering or acuminate apex, 1.6-1.7 mm long, 0.45-0.55 mm in diameter. Stipe slender, erect, 1.8-1.9 mm long. Hypothallus well developed, dark blackish brown, rotate. Peridium evanescent, dehiscence irregular, columella prominent, blackish, shining.

Capillitium abundant, arising from the entire columella, dark brown to pale. Spores dark purplish brown in mass, violaceous brown under transmitted light, globose, 7.0-8.5 µm in diameter, warted.<sup>[15]</sup>

Collection examined: RRT/ 8989, July 2006, Atapadi, District Sangli. On dead and decaying sugarcane straw.

Distribution: India: The population of *C. aequalis* Peck., lack nodding sporangia, but a stout and thick columella is like the stalk. The columella either becomes narrows slightly towards apex or is dendroid and its branches merge into the capillitial net above. The surface net of capillitium is delicate.<sup>[7,15]</sup> *C. aequalis* Peck<sup>[15]</sup> is closely related to *C. typhoides* (Bull.) Rost.<sup>[16]</sup> However, *C. typhoides* (Bull.) Rost., is marked by erect, culindric, sporangia slightly tapered above, long stipe, capillitium dark brown, small, pale spores with cluster of dark warts.<sup>[16]</sup>

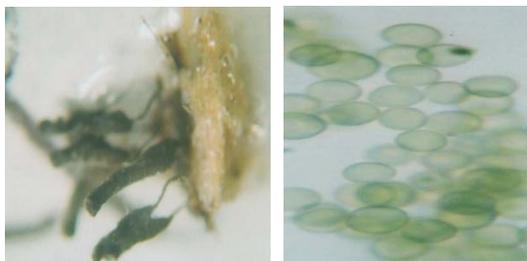


Figure 4: *Comatricha aequalis*

It is thus recommended that further exploration should be done to identify Myxomycetes species in various locations. This will provide more options in the management of cancers.

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**Conflict of Interest:** None declared