



**PRESERVATION OF MYXOMYCETOUS BIODIVERSITY FROM
NAVEGAON BANDH**

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Abstract

During the floristic study of the myxomycetes of this region author come across a number of myxomycetous species. This is the series of paper. In the fifth paper of this study four species of myxomycetes are being discussed. Didymium Schrad. with four species are being discussed for the first time from this region i.e.1. Didymium chryso sporum Lakhanpal & Mukerji 2. Didymium muscorum Lakhanpal & Mukerji 3. Didymium squamulosum (Alb. & Schw) Fries and 4. Didymium verrucosporum Welden

Key words: Myxomycetes, slime moulds.

Introduction

The Myxomycetes or 'the true slime – moulds' are the fungi like organisms, possess an assimilative phase of free living, multinucleate, mobile mass of protoplasm called as the plasmodium, and a sporulating phase consisting of a mass of spores typically borne in a simple or complex membranous or tough, non-cellular spore case. In addition to spores, often there is a system of free or netted threads forming a capillitium or pseudocapillitium. Navegaon Bandh one of the national park in Maharashtra constitute the East Vidarbha of Gondia district the region under investigation is very rich in biodiversity. The study of myxomycetes was practically neglected from this region. Hence, it was felt to undertake the study.

Materials And Methods

The present work is based on myxomycetous floristic exploration from the region. An extensive and intensive field work was undertaken to collect the maximum number of specimens of myxomycetes. Visits to different localities were made frequently. Localities for visit were selected so as to cover the maximum representation of the area under investigation. Repeated visits were made to some of the localities for the collection of the specimens. Specimens were collected along with collection of the specimens. Specimens were collected along with their natural substrates. For the preservation of specimens, empty cigarettes boxes found to be very suitable, convenient, easily available, easy to handle and economical.

Paper trays of the proper size were prepared so as to get it fit inside the box tray.

As per the spreading of the specimen, its natural substrate was cut into suitable size and glued with the fevicol adhesive in the centre of the paper tray. Each box was provided with field notes of respective specimen. The accession number was written on the specimen box and on the paper tray also, and entered in accession register. After observation; specimen boxes were stored and placed in 'Generic' boxes provided with naphthalene ball to prevent insect entry. Generally specimen boxes were carried to the field to preserve the specimen intact. Sometimes because of heavy collection, specimens were brought to the laboratory on their natural substrate, in a special handling basket, so as not to disturb them. Then they were preserving.

In rainy season, the collected specimens were dried in the incubator or and oven at 40° c. But sun drying was found to be most suitable for maintaining natural characters. Artificial drying sometimes leads to the shrinkage of weak and flaccid stalk, hardening of wet sporangia and cracking of peridium. All the specimens were identified and confirmed with the help of Martin and Alexopoulos (1969) sometimes, Lister (1925),Hagelstein (1944), Farr (1976), were followed. Monographs on Indian Myxomycetes of Thind (1977), Lakhanpal and Mukerji (1981), were of almost indispensable for final confirmation. Concerned literature in this regards were also studied.

Results And Discussion:

1. *DIDYMIUM CHRYSOSPORUM* Lakhanpal & Mukerji

Acta. Bot. India, **6**, 16, 1978.

Lakhanpal & Mukerji, *Indian Myxomycetes*, p. 271-272, 1981.

(FIG. 1)

Fructification sporangiate, stipitate, scattered, erect, rarely nodding, white, 1.2 – 1.5 mm tall. Sporangia globose, subglobose to hemispheric, 0.4 – 0.7 mm in diam., umbilicate below. Stipe thick, stout, cylindric, broader at the base, vertically rugose, dark brown to yellowish brown, opaque, filled with refuse matter towards the base, reddish brown and translucent towards the apex, 0.68 – 0.89 mm long, nonlimy. Hypothallus small, rotate, thin, membranous, dark brown, smooth, nonlimy. Peridium single, thin, membranous, hyaline, covered with white stellate lime crystals; dehiscence irregular, upper part floccose, basal part persistent. Columella globose or hemispheric, less than half of the sporangial cavity, white or ochraceous, limy, filled with small rhomboidal lime crystals. Capillitium abundant, radiating from columella and attached to the peridium, filamentous, tubular, branched and anastomosing, with dark spherical or fusiform thickenings, brown, paler at both the ends. Spores dark brown to black in mass, violaceous brown under transmitted light, globose, 8.3 – 9.7 µm in diam., minutely warted, warts in clusters.

COLLECTION EXAMINED: NVC / 261, 262, 263, 264, 266, Aug.-2015, Navegaon Bandh, Dist.-Gondia. On dry angiospermic leaf.

DISTRIBUTION : INDIA : Delhi (Lakhanpal & Mukerji, 1978); Gujrat (Salunkhe, 1995); M. P. (Kharat, 2000); M. S. (Rokade, 1989; Chimankar, 1993; Jadhav, 1994; Tembhrune, 2011).

The distinguishing features of the species are: (1) Peridium is hyaline and floccose (2) Columella is well developed and (3) Prominently warted spores with distinct clusters of warts. The species can be compared with *D. lenticulare* Thind and Lakhanpal for its hyaline peridium and prominently warted spores, but it differs from latter in having smaller stipe, smaller spores and well developed columella.

2. *DIDYMIUM MUSCORUM* Lakhan. & Mukerji

Trans. Mycol. Soc. Japan., **17**, 123, 1976.

Lakhanpal & Mukerji, *Indian Myxomycetes*, p. 287-288, 1981.

(FIG. 2)

Fructification sporangiate, short stipitate to sessile, white, scattered, gregarious to clusters,

sometimes more than two sporangia fused together. Sporangia globose to subglobose, deeply and narrow umbilicate below, 0.34 – 0.42 mm tall, 0.29 – 0.80 mm in diam. Stipe when present, short, completely embedded in the umbilicus of sporangium, weak, slender, vertically rugose, white to yellowish white, dusted with rhomboidal lime crystals. Hypothallus rotate, thin, white, smooth or venulose, limy with rhomboidal lime deposition. Peridium single, thin, membranous, hyaline, densely covered with white, stellate lime crystals forming thick, corrugated crust; dehiscence irregular, upper half floccose, basal half persistent as an irregular, small shallow cup. Columella globose to hemispheric or discoid, white or pale yellowish, less than half of the sporangial cavity, limy, filled with rhomboidal lime crystals. Capillitium radiating from columella and attached to peridium, abundant, filamentous, thin, hyaline or pale brownish then paler at both the ends, dichotomously branched, sparsely anastomosed, with membranous expansions near dichotomy, threads bearing elongated or spindle shaped calciform vesicles as well as some dark spherical or spindle like thickening, rarely with dark rings. Spore black in mass, deep violaceous brown under transmitted light, globose, 9.7 – 12.4 µm in diam., strongly warted, warts in small lines and clusters.

COLLECTION EXAMINED: NVC / 275, 276, 277, 278, Aug.-2015, Navegaon Bandh, Dist.-Gondia On dry angiospermic leaves.

DISTRIBUTION : INDIA : Delhi (Lakhanpal & Mukerji, 1976, 1981); Gujrat (Salunkhe, 1995); M. S. (Nanir, 1978; Rokade, 1989, Chimankar, 1993; Jadhav, 1994; Tembhrune, 2011); M. P. (Kharat, 2000).

D. muscorum Lakhan. & Mukerji, is close to *D. karstensii* Nann.-Brem., and *D. squamulosum* (Alb. & Schw.) Fr. *D. karstensii* is differentiated by its double layer of peridium, prominently warted spores with one or more equatorial and compression ridges forming lax reticulation. *D. squamulosum* (Alb. & Schw.) Fries, possesses minutely warted spores of 8 – 11 µm in diam., hyaline or pallid capillitium and conspicuous venulose white hypothallus. *D. muscorum* Lakhan. & Mukerji, is characterized by its violet brown spores of 11 – 12.5 µm in diam., strongly warted forming prominent clusters and lines of warts, well developed columella; peridium single, limy, corrugated and stipe if present short, weak, prominently rugose, limy, embedded in the deep umbilicus of sporangium.

3. *DIDYMIUM SQUAMULOSUM* (Alb. & Schw.) Fries

Symb. Gast., p. 19, 1818.

Martin, G. W. & C. J. Alexopoulos, *The Myxomycetes*, p. 397-398, 1969.

(FIG. 3)

Fructification sporangiate, stipitate, scattered to gregarious, white to grayish white, 0.38 – 1.1 mm tall. Sporangia globose, subglobose to hemispheric, deeply umbilicate below, 0.25 – 0.6 mm in diam. Stipe white to creamy white, cylindrical, erect, vertically rugose, often lime externally, 0.25 – 0.85 mm long. Hypothallus small, rotate, thin, white, limy, venulose sometimes. Peridium single, thin, membranous, hyaline, iridescent, covered with white stellate lime crystals agglutinated to form thick corrugated layer ; dehiscence irregular, upper part floccose, basal part remain persistent. Columella globose, hemispheric, flattened, discoid, white to brownish, limy, filled with rhomboidal lime crystals, reaching upto the centre of the sporangial cavity. Capillitium abundant, radiating from columella and attached to peridium, thin, delicate, filamentous, dichotomously branched and anastomosed, violaceous brown, paler at both the ends, marked with some calciform hyaline vesicles and dark spherical or elongated swellings along with few membranous expansions at dichotomy. Spore mass black, deep violaceous brown under transmitted light, globose, 7 – 10 µm in diam., strongly warted or verrucose, warts in clusters and lines.

COLLECTION EXAMINED: NVC /267, 268, 269, 270, Aug.-2015, Navegaon Bandh, Dist.-Gondia On dry and decaying leaves and twigs of aniospermic plants.

DISTRIBUTION : INDIA: Delhi (Singh & Pushpavathy, 1965 ; Lakhanpal & Mukerji, 1981) ; Gujrat (Salunkhe, 1995) ; H. P. (Lakhanpal, 1973 ; Thind, 1977) ; Punjab (Thind, 1977) ; T. N. (Agnihotrudu, 1956) ; U. P. (Lakhanpal & Mukerji, 1981 ; Thind & Sohi, 1956 ; W. B. (Lodhi, 1954 ; Thind, 1977 ; M. P. (Kharat, 2000) ; M. S. (Nanir, 1978 ; Rokade, 1989 ; Chimankar, 1993 ; Jadhav, 1994 ; Tembhuerne, 2011).

The species is characterized by depressed globose, white, umbilicate, sporangia; short, stout, rugose, limy stipe; small, rotate, venulose, limy hypothallus; globose or hemispheric columella ; and verrucose spores. *D. squamulosum* (Alb. & Schw.) Fries is closely allied to *D. intermedium* Schroet, which, however, possesses a prominent, branching hypothallus, giving rise to clusters of sporangia,

two types of crystals, and spiny, subreticulate spores. It is also close to *D. muscorum* Lakhan. and Mukerji is differentiated in its rotate, thin, smooth or venulose hypothallus ; sometimes more than two sporangia fused together ; stipe vertically rugose ; peridium stellate lime crystals forming thick corrugated crust ; capillitium hyaline or pale brown ; columella globose to hemispheric ; spores strongly warted, warts in small lines and clusters and *D. thindii* Rokade & Nanir, sp. nov. is distinguished by its hypothallus rotate, venulose or smooth when isolated, branched, stranded and raised between sporangia ; scattered sporangia ; stipe longitudinally rugose ; peridium with lime crystals deposited forming uniform rough surface layer ; capillitium dark brown ; columella flat ; spores often with papillae, warted, warts unequal in length, sparsely and unevenly distributed forming clusters and lime of warts.

4. *DIDYMIUM VERRUCOSPORUM* Welden
Mycologia, 46, 98, 1954.

Martin G. W. & C. J. Alexopoulos, *The Myxomycetes*, p. 400, 1969.

(FIG. 4)

Fructification sporangiate, stipitate, scattered to gregarious, nodding, white to grayish white, 0.76 – 1.5 mm tall. Sporangia globose, subglobose to hemispheric, with narrow umbilicus below 0.34 – 0.80 mm in diam. Stipe long, subulate, mostly nodding, vertically rugose, dark brown at the base, reddish brown or orange brown, transperant towards the apex, nonlimy, broader at the base, narrow towards the apex, 0.55 – 1.1 mm long. Hypothallus rotate, dark brown, thin membranous, nonlimy, may contain refuse matter. Peridium single, thin, membranous, hyaline, densely covered with white stellate lime crystals, forming compact rough crust ; dehiscence irregular, upper part floccose, basal part persistent. Columella globose or hemispheric, white, limy, filled with rhomboidal lime nodules, reaching near the centre of the sporangial cavity. Capillitium radiating from columella and attached to the peridium, thin, delicate, filamentous, yellowish brown, hyaline at both the ends, dichotomously branched and anastomosed, frequently bears dark nodular and elongated thickenings. Spore black in mass, violaceous brown under transmitted light, globose, 6.9 – 9.7 µm in diam., prominently warted, warts in clusters and lines.

COLLECTION EXAMINED: NVC / 271, 272, 273,274 Aug. 2015, Navegaon Bandh Dist.-Gondia. On dry leaf, twigs and straw of angiospermic plants.

DISTRIBUTION : INDIA : Delhi & H. P. (Lakhanpal, 1973) ; M. P. (Kharat, 2000); Gujrat (Salunkhe, 1995) ; M. S. (Nanir, 1978) ; Rokade, 1989 ; Chimankar, 1993 ; Jadhav, 1994; Tembhurne, 2011).

D. verrucosporum Welden is the member of *D. nigripes* (Link) Fries complex. It is differentiated in its pure white columella and delicate colourless peridium. From *D. iridis* (Ditm.) Fr. it is marked by darker and strongly warted spores with cluster and lines of warts. The species can be characterized by its nodding sporangia, long, slender subulate stipe, darker towards the base, yellow brown or violaceous capillitium bearing swellings and distinctly warted spores with clusters and lines of warts. Lakhanpal (1973) described the species for the first time from India, in which he did not mention the lines of warts on spore.

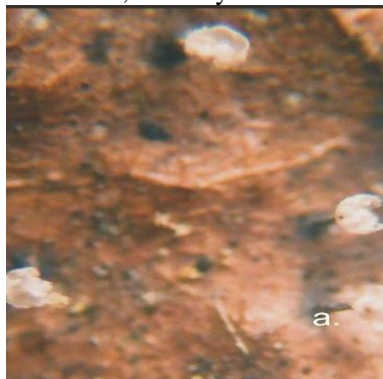
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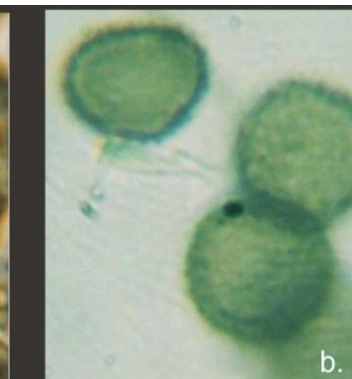
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1a



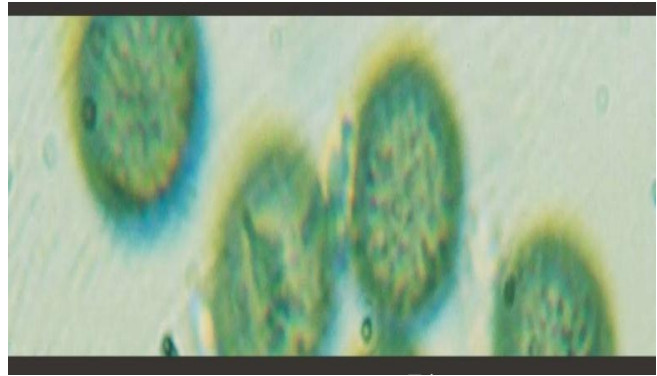
2a.



2b.



3a.



3b.



4a.



4b.

1. *Didymium chrysosporum* lakhanpal & mukerji a.habit
2. *Didymium muscorum* lakhanpal & mukerji a. Habit, b. Spores

3. *Didymium squamulosum* (alb. & schw) fries a. Habit , b. Spores
4. *Didymium verrucosporum* welden a. Habit, b. Spores