NEW SIX SPECIES OF THE MYXOMYCETES RECORDED FROM THE SOUTH-WEST REGION OF MAHARASHTRA (INDIA)

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ABSTRACT

During the floristic study of the myxomycetes of this region author come across a number of myxomycetous species. Diderma Pers. being discussed with six species, *Diderma cor-rubrum* Macbr. Marked by its wrinkles sporangia, short stipe prominently verrucose, large spores; *Diderma deplanatum* Fr. gregarious to crowded fructification varying pulvinate sporangia; *Diderma effusum* (Schw.) Morgan white fructification, delicate hyaline capillitium and minutely verrucose spores; *Diderma farrianum* Nanir & Rokade sp. nov. sporangia compact, capillitium with membranous expansion, spores large, conspicuously spiny; *Diderma hemisphaericum* (Bull.) Hernem. White sporangia with short stipe and *Diderma lohogaensis* Patil, Ranade & Mishra, typically infundibuliform, chest nut brown sporangia. All species are being reported for the first time from this region.

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. South-West of Maharashtra the region under investigation is very rich in biodiversity-constitute the districts Sholapur, Satara, Sangli and Kolhapur. 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 their natural substrates. For the preservation of specimens, empty cegarates 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 preserved.

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 indispensible for final confirmation. Concerned literature in this regards were also studied.

RESULTS AND DISCUSSION

1. *DIDERMA COR-RUBRUM* Macbr.

***N. Am. Slime-moulds, ed.* 11 nd**, 140, 1922.

COLLECTION EXAMINED : RRT / 8013, 8036 , 8060 Sept.-2003 , Panhala , Dist.-Kolhapur . On dry leaves and stem of angiospermic plants .

DISTRIBUTION : INDIA : Gujrat (Salunkhe 1995); H. P. (Thind *et al.* 1971; Lakhanpal 1974); M.S. (Patil and Ranade 1974 ;Jadhav 1994); M.P. (Kharat 2000).

The species studied in present report is quited similar to Indian populations reported earlier except the spore size. Thind (1977), Lakhanpal (1981), mentioned the spore size 10-12.5 µm, where as present population it is 12-13.5 µm. in diam. Indian population differs from *D. cor-rubrum* Macbr. in lacking cartilaginous outer peridium and limy bars connecting the columella with the peridium (Sensu Thind 1977, Lakhanpal 1981).

Diderma cor-rubrum Macbr. can be marked by prominently pitted to wrinkled sporangia surface; short stipe, simply a prolongation of the well developed hypothallus (both calcareous); double peridium; large reddish brown clavate columella; pale capillitium and dark, prominently verrucose, large spores. The outer peridium is with reddish brown patches on the inside, except for the characteristic paler-coloured or whitish reticulate lines, along which the sporangia dehisce later on.

D. cor-rubrum Macbr., is closely allied with *D. rugosum* (Rex) Macbr. are both species possess a reticulately ridged peridium . Former belongs to the subgenus *Diderma* Pers. and the latter to the subgenus *Leangium* Link.

2. *DIDERMA DEPLANATUM* Fr.

Syst, Myc., **3**, 110, 1929.

COLLECTION EXAMINED: RRT / 8077, Sept.-2003, Panhala, Dist.-Kolhapur. On dry leaf of angiospermic plant.

DISTRIBUTION: INDIA: M.P. (Kharat 2000); M.S. (Patil and Ranade 1995; Rokade 1989; Jadhav 1994); T.N. (Indira 1975); U.P. (Thind & Sohi 1956; Thind and Sehgal 1963).

Earlier reports from India (Thind 1977), described the species with densely crowded sporangia so as to appearing pseudoaethalioid along with remote inner peridium and abundant capillitium. 'A typical' forms accompanied with sporangiate from is reported by (Thind and Sehgal (1963), from U.P.

The species is characterized by white, gregarious to crowded fructification varying from pulvinate sporangia to curved, anulate plasmodiocarp and columella represented by thickened raised base. *D. deplanatum* Fries,is close to *D. niveum* (Rost)Macbr. However, later possesses large columella and subplasmodiocarpous habit is rare. It is also close to *D. chondrioderma* (de Bary & Rost.) G. Lister, in fruiting but also differs in delicate capillitium and smaller spores.

3. *DIDERMA EFFUSUM* (Schw.) Morgan

J. Cincinn . Soc . Nat . Hist ., **16**, 155 , 1894 .

COLLECTION EXAMINED: RRT / 8034,8037, Aug. 2003, Panhala, Dist.-Kolhapur. On dry leaves of angiospermic plants.

DISTRIBUTION: INDIA : A.P. (Agnihothrudu,1956); Assam (Agnihothrudu1959); Delhi (Lakhanpal & Mukerji 1981); H.P. (Lakhanpal1973); M.S. (Patil & Ranade1974; Nanir *et al* 1993); T.N. (Indir, 1968); U.P. (Thind & Sohi 1956); W.B.(Bruhl & Gupta 1927 ; Lodhi 1934) .

The species is marked by densely gregarious to crowded, effused, white fructification, frequently arranged in reticulate pattern in to lorge patches, peridium double, delicate hyaline capillitium and minutely verucose spores. *D. effusum* (Schw.) Morgan, can be compared with *D. globosum* Pers. *D. hemisphaericum* (Bull.) Hernem, and *D. platycarpum* Nann.-Brem. In *D. globosum* Pers., capillitium is flexous with irregular expansion near the base and conspicuous clavate columella. In *D. hemisphaericum* (Bull.) Hornem, sporangia are stipitate wrinkled and umbellicate below. In *D. platycarpum* Nann.-Brem., fruiting is typically plasmodiocarpous, broadly effused, branched or netted, and spores are warted and arranged in clusters.

Microscopically *D. effusum* Link and sessile from *D. hemisphericum* (Bull.) Hernem, are very alike too 'in small and pale spores and slender capillitium which is more or less flexuous'. According to Nanneng-Bremekamp (1958) sessile from of *D. hemisphericum* (Bull.) Hernem, and *D. effusum* (Schw.) Morgan can be separated on the basis of the size of lime granules. 'In *D. effusum* (Schw.) Morgan, granule size is very small while in *D. hemisphericum* (Bull.) Hernem,size of the granules is up to 4 mm in diam.'

4. *DIDERMA FARRIANUM* Nanir & Rokade sp. nova.

COLLECTION EXAMINED: RRT / 8067, Sept.-2003, Panhala, On dry leaves of angiospermic plants .

DISTRIBUTION : INDIA : Gujrat (Salunkhe 1995); M.P. (Kharat 2000); M.S. (Rokade,1989 ; Chimankar 1993; Jadhav 1994).

The present species is characterized by:(1) sporangia compactly aggregated laterally forming pseudoaethaloid structure.(2) Sporangia discoid on membranous stalk-like weak extension of reticulate hypothallus. (3) Columella is raised thicked base of sporangium. (4) Capillitium with membranous expansion at dichotomy. (5) Outer peridium smooth, tough, creamy pinkish white. (6) Spores large, 13-15 µm in diam., conspicuously spiny, spines upto 2-5 µm.

The species is quite distinct by itself. However, apparently it resembles with *D. effusum* (Schw.) Morgan, but later can be distinguished by pulvinate sporangia, dark purple spore mass, minutely warted small spores (7-9 um) with faint clusters of large warts.

5. *DIDERMA HEMISPHAERICUM* (Bull.) Hernem.

Neus Mag. Bot. **1** , 13 , 1829.

COLLECTION EXAMINED: RRT/ 8001 , 8063 , Sept.-2003 , Panhala , Dist.-Kolhapur ; 8018 , 8065 , 8066 , 8070 , 8083 , 8087 , Aug.-2004 , Pachagani , Dist.-Satara ; 8523

, 8525 , Aug.-2005 , Sukrachari , Dist.-Sangli . On dry leaves of angiospermic plants .

DISTRIBUTION : INDIA : Assam (Agnihothrudu 1956); Delhi (Singh & Pushpavathy 1965 ; Lakhanpal & Mukerji 1981); Gujrat (Salunkhe 1995); H.P. (Lakhanpal 1973); M.P. (Kharat 2000); M.S.(Patil & Ranade 1974; Nanir 1978; Rokade 1989; Chimankar 1993; Jadhav 1994); Orissa (Ghosh & Dutta 1961); Punjab (Thind 1977); T.N. (Agnihothrudu 1954; Indira 1968); U.P. (Thind & Rehill 1958); W.B. (Thind 1977).

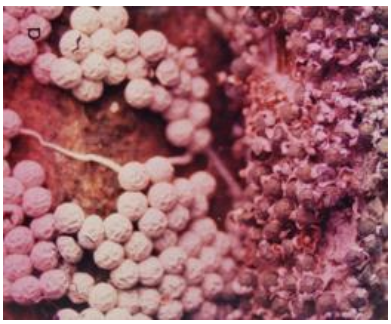
Very typical and widely distributed species, easily recognized by its flat, discoid sporangia and circumsessile dehiscence of outer fragile limy layer of peridium. The plasmodiocarps are difficult to distighuish from *Diderma platycarpum* Nann.-Brem., and *D. effusum* (Schw.) Morgan. It is only possible to recognize on the basis of size of lime granules in the peridium (sensu Nann.-Brem.), In *D. hemisphaericum* (Schw.) Morgan, the size of lime granules are variable, where as in the rest, the size is more or less uniform and another character is the thickness of the fruiting i.e. *D. platycarpum* Nann.-Brem. it is very thin without columella or any raised base.

D. hemisphericum (Schw.) Morgan can be compared with *D. indicum* Thind & Sehgal.*D. hemisphericum* (Schw.) Morgan is charactriesed by strongly depressed, discoid, lenticular or orbicular, white sporangia, umbilicate below, seated on stout, rugose, white, calcareous, short stipe. *D. indicum* Thind & Sehgal, is marked by its heaped white fructification with violaceosu or pinkish hue at the top; crustose, shell-like single peridium, the prominent and areolate columella; the violaceous capillitial threads prominently marked by fusoid swellings and the globose or ovoid, irregular, inconspicuously verrucose spores.

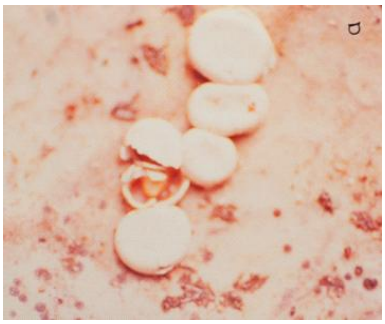
6. *DIDERMA LOHOGADENSIS* Patil, Ranade & Mishra *M . V . M . Patrika* , **14 (1)** , 35-36, 1979.

COLLECTION EXAMINED : RRT/ 8002 , 8029 , 8051 , 8078 , Aut.-2003 , Panhala , Dist.-Kolhapur . On dry leaves and twig of angiospermic plants.

DISTRIBUTION: INDIA: Gujrat (Salunkhe 1995); M.S. (Mishra and Ranade 1979; Nanir 1978 ; Rokade 1989; Chimankar 1993; Jadhav 1994; Nanir *et al.* 1991 , 1992 , 1993); M. P. (Kharat 2000).



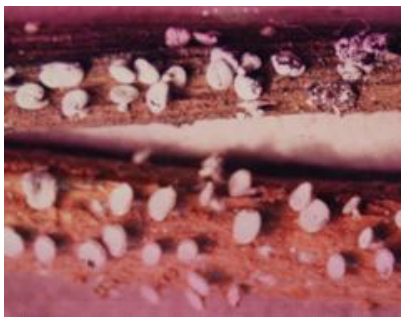
1. *Diderma cor-rubrum*



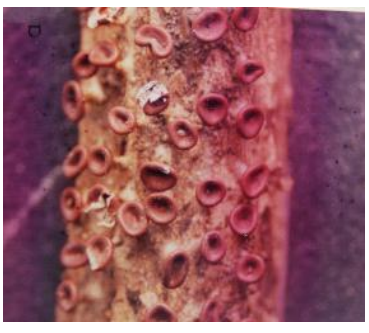
2. *Diderma deplanatum*

3. *Diderma effusum*

4. *Diderma farrianum*



5. *Diderma hemisphaericum*



6. *Diderma lohogadensis*

It is very distinct species of the myxomycetes. The typical infundibuliform, chest-nut brown sporangia of this species can be detected even in the field. This alone is sufficient diagnostic feature to differentiate this species from the known species of *Diderma* Pers. Besides, other features of this species are-cartilaginous, triple peridium and large spores of (10–15 µm). In the type description the sporangia and spores are smaller (9.5–12µm in diam.). The species can be characterized by its quite unique shape of sporangium. To date the species is known from the Maharashtra only.

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