



SOME MYXOMYCETES FROM ANDHRA PRADESH, INDIA

C. MANOHARACHARY, I.K. KUNWAR AND K.V.B.R. TILAK

Department of Botany, Osmania University, Hyderabad-500007, A.P.

e-mail: cmchary@rediffmail.com

Limited literature is available on floristics of Myxomycetes from India, and no report exists from Andhra Pradesh. Twenty Myxomycetes colonizing diversified habitats have been collected from different forest localities of A.P. and the data has been presented. All the 20 Myxomycetes form new additions to Andhra Pradesh.

KEYWORDS: Andhra Pradesh, Forests, Habitats, Myxomycetes

Myxomycetes (myxa = slime; mycetes = mushrooms, fungi), commonly known as true slime molds were considered earlier as fungi only but now raised to the level of phylum in a separate Kingdom Protozoa (Kirk *et al.* 2008). These non-chlorophyllous, coenocytic, eukaryotic and multinucleate living organisms possess a free-living state and exhibit phagotrophic nutrition. Saprobiic plasmodium shows a shuttle movement of the protoplasm and plasmodium becomes a resting body or sclerotia under poor conditions. There are four stages in the life cycle of a myxomycete namely: 1) three types of uninucleate cells, one of which is flagellate, 2) multinucleate somatic phase known as plasmodium, 3) resting spores consisting of sclerotia, 4) reproduction leads to stationary sporophores containing walled spores that get dispersed by wind or water and arthropods. Mitotic division shows the presence of non-persistent nuclear membrane (centric) that breaks down in prophase while another being acentric with nuclear membrane being intact like in fungi.

Saprobiic plasmodium (the mobile phase of protoplasm) sometimes becoming a resting body or sclerotia under poor conditions. Spores of myxamoebae exist as microcysts and sporangia are either sessile or stalked, often bright coloured. Spores are produced in masses after meiosis and possess persistent or

evanescent peridium. Swarm cells are usually with two anterior flagella and are without cell wall. Spores form myxamoebae directly or after the loss of flagella and sometimes undergo division before copulation. Swarm cells or myxamoebae undergo copulation followed by karyogamy resulting in diploid zygote formation. Zygote on germination gives rise to young plasmodium which becomes mature plasmodium or sclerotium. Sclerotia also get converted into plasmodia which on germination produce sporangia. Meiosis takes place before the mature sporangia are formed. Mature sporangia release spores which on germination release myxamoebae or swarm cells.

Earlier some researchers have reported myxomycetes from India (Lister 1925, Lodhi 1934, Agnihotrudu 1954, 1968, Butler and Bisby 1960, Singh and Pushpavathy 1966, Indira 1971, 1975, Thind 1977, Dhillon and Bermekamp 1978, Bilgrami *et al.* 1979, 1991, Lakhanpal 1983, Nanir 1985, Sarbhoy *et al.* 1975, 1996, Jamaluddin *et al.* 2004, Ranade *et al.* 2012, Tembhurne and Nanir 2011, Tembhurne *et al.* 2012). However, the floristics of myxomycetes has not been explored on par with fungi and algae in India and in particular from Andhra Pradesh. Hence, an attempt has been made to explore the myxomycetes associated with diversified habitats of some

forest localities in Andhra Pradesh, India, and the data has been presented.

MATERIALS AND METHODS

Collections were made during July to December (2009-2010). About 120 samples were collected from the forests of Narsapur, Mulugu, Khammam, Araku valley, Ahobilam, Tirumala hills, Vikarabad, Nallamalai and Achampet areas of Andhra Pradesh. Slime molds were collected from dead leaves, twigs, litter, bark, wood logs, etc. Meticulous care was taken during transportation. The collected

the Herbarium of Osmania University under OUMH accessions.

RESULTS AND DISCUSSION

Myxomycetes are a cosmopolitan group and are ubiquitous. These are found colonizing litter, bark, wood logs, decaying wood, dead leaves, culms, well manicured lawns, flower beds, humid soils, earthworm casts, dung, dead branches attached to living trees and other substrates. Myxomycetes are distributed in tropics, sub-tropics, temperate forests and also in deserts. Temperature, moisture, rainfall and

Table 1. Myxomycetes collected from some forest localities of Andhra Pradesh

Sl. No.	Myxomycete member	Place of collection	Source	Accession No.
1.	<i>Arcyria cinerea</i> (Bull.) Pers.	Pascal forest	Dead wood	OUMH 13
2.	<i>Arcyria nutana</i> (Bull.) Grev.	Araku	Dead wood	OUMH 14
3.	<i>Badhamia papaveracea</i> Berk. & Ravenel	Araku	Wood log	OUMH 16
4.	<i>Ceratiomyxa fruticulosa</i> (Mull.) Macbr.	Bhadrachalam	Dead wood	OUMH 09
5.	<i>Comatricha irregularis</i> Rex	Tirumala hills	Dead wood	OUMH 20
6.	<i>Comatricha laxa</i> Rostaf	Bhadrachalam	Dead wood	OUMH 21
7.	<i>Comatricha typhoides</i> (Bull.) Rostr.	Srisailam forest	Litter	OUMH 22
8.	<i>Cribraria piriformis</i> Schrad	Araku	Dead wood	OUMH 11
9.	<i>Dictydium cancellatum</i> (Batsch) T. Macbr.	Tirumala hills	Dead wood	OUMH 12
10.	<i>Diderma donkii</i> Nann.-Bremk.	Vikarabad forest	Dead wood	OUMH 27
11.	<i>Diderma rugosum</i> (Rex) T. Macbr.	Botanical garden, O.U.	Dried leaves, litter	OUMH 19
12.	<i>Lycogala epidendrium</i> (L.) Fries	Bhadrachalam	Dead wood	OUMH 10
13.	<i>Metatrichia resparium</i> Batsch	Vikarabad	Litter	OUMH 15
14.	<i>Physarum echinosporum</i> Lister	Kothagudem	Dead twigs	OUMH 17
15.	<i>Physarum nucleatum</i> Rex	Forest near Ramappa Temple	Unidenti-fied wood	OUMH 18
16.	<i>Stemonitis fusca</i> Roth.	Kothangudem	Dead wood	OUMH 24
17.	<i>Stemonitis oxosora</i> (Bull.)Macbr.	Narsapur forest	Fallen leaves	OUMH 23
18.	<i>Stemonitis pallida</i> Wingate	Vikarabad forest	Dead wood log	OUMH 28
19.	<i>Stemonitis smithii</i> Macbr.	Bhadrachalam	Bark	OUMH 25
20.	<i>Stemonitis splendens</i> Rost.	Ahobilam forest	Dead leaves	OUMH 26

samples were preserved in small plastic vials of 2 ½ x 4 cm and were placed vertically in cardboard boxes. Later samples were sun dried and on return were treated with potassium chlorate and calcium chlorate for dehydration by keeping them in desiccators (Davis 1965). For observing calcareous members, Hoyer's medium (Distilled water - 50ml, Arabic gum - 30g, chloral hydrate - 200g, glycerin - 20g) was used. Non-calcareous specimens were observed in glycerin mixed with water (40:20). The examined materials have been deposited in

other factors are known to influence the periodic occurrence and seasonal variation of species. Agnihotrudu (1954), Indira (1971, 1975), Thind (1977) and Lakhanpal and Mukerji (1981) have made significant contributions to the understanding of myxomycetes from India.

From the Table 1 it is evident that 20 Myxomycetes have been collected from different localities. Among all the substrates, it is noticed that dead wood has been colonized by maximum number of Myxomycetes. It is

interesting to observe that all the twenty Myxomycetes reported form new additions to Myxomycete diversity of Andhra Pradesh, India.

The authors (CMC and Kunwar) are thankful to UGC and MOEF, New Delhi and KVBR Tilak is thankful to NASI, Allahabad for their financial support and encouragement.

REFERENCES

- Agnihotrudu V 1954 Some slime molds from Southern India-I. *J Indian bot Soc* **33** 171-189.
- Agnihotrudu V 1968 Some slime molds from Southern India X. *Sydowia* **22** 171-182.
- Bilgrami KS, Jamaluddin & Rizvi MA 1979 *The fungi of India Part I* (List and references). Today and Tomorrow Printers and Publishers New Delhi p. 467.
- Bilgrami KS, Jamaluddin & Rizvi MA 1991 *The fungi of India Part III* (List and references). Today and Tomorrow Printers and Publishers New Delhi p. 798.
- Butler EJ & Bisby G 1960 *The fungi of India*. (Revised by RS Vasudeva) Indian Council of Agricultural Research New Delhi Publication p. 552.
- Davis EE 1965 Preservation of Myxomycetes. *Mycologia* **57** 986-988.
- Dhillon SS & Bremekamp NEN 1978 Notes on some Myxomycetes from North-western part of the Himalaya. *K Ned Akad Wet Proceedings C* **80** 257-260.
- Indira PU 1971 Some slime moulds from South India XI. *Kavaka* **3** 41-54.
- Indira PU 1975 Some slime molds of Southern India XI. *Kavaka* **3** 41-54.
- Jamaluddin, Goswami MG & Ojha BM 2004 *Fungi of India* (1989-2001). Scientific Publishers India p. 320.
- Kirk P, Cannon PF, Minter DW & Stalpers JA 2008 *Ainsworth & Bisby's Dictionary of the Fungi*. 10th edn. CAB International p. 784.
- Lakhanpal TN 1983 Contributions to Indian Myxomycetes during the decade 1970-1980. *Bibl Mycol* **91** 319-353.
- Lakhanpal TN & Mukerji KG 1981 Indian Myxomycetes. Cramer Publishers p. 530.
- Lister G 1925 *A monograph of the Mycetozoa* 3rd edition (Revised by Lister Gulielma) British Museum (Natural History) London.
- Lodhi SA 1934 *Indian slime moulds (Myxomycetes)*. Punjab University Publication Lahore p. 34.
- Nanir SP 1985 Contribution to the knowledge of Myxomycetes from India-III B. *Indian bot Repr* **4** 42-45.
- Ranade VD, Korade ST, Jagtap AV & Ranadive KR 2012 Checklist of Myxomycetes from India. *Mycosphere* **3** 358-390.
- Sarbhoy AK, Agarwal DK & Varshney JL 1996 *Fungi of India: 1982-1992*. CBS Publishers and Distributors New Delhi p. 350.
- Sarbhoy AK, Giridharlal AL & Varshney JL 1975 *Fungi of India (1967-1971)*. Navyug Publishers New Delhi p. 390.
- Singh H & Pushavathy KK 1966 The slime moulds of Delhi II. *Mycopathologia* **28** 265-272.
- Tembhurne R R & S P Nanir 2011 New Five Species of the Myxomycetes recorded from the South-East Region of Maharashtra (India). *Science Research Reporter* **1** 65-68.
- Tembhurne RR, Nanir SP & Nasarin S 2012 New four species of the myxomycetes recorded from the south-east region of Maharashtra (India). *Bioscience Discovery* **3** 214-217.
- Thind KS 1977 *The Myxomycetes In India*. Indian Council of Agricultural Research New Delhi Publication p. 452.