

Abstract

The purpose of this experiment was to compare the morphology of spores of six different species of myxomycetes (slime molds). Specimens were collected in the Big Thicket National Preserve, TX. Observations were made using light microscope and scanning electron microscopes. Based on the results, the surface structure of spores could be used in the identification of myxomycetes species using SEM.



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Spore Morphology Among Different Myxomycetes

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Introduction

Myxomycetes (slime molds) are small eukaryotic organisms. Though they have characteristics of animals and fungi, they are classified as Protists. Myxomycetes is Greek; the word *myxa* means "slime" and *myketes* means "fungi". (Stephenson 1994)

Myxomycetes are found in bacterial rich environments such as rotting logs, dead leaves, and dry branches. There are two stages slime molds must go through; the plasmodial stage and the fruiting body stage. Plasmodium is a multinucleated structure before fruiting. It has a fan-shaped network of veins containing streaming protoplasm. In unfavorable conditions, the slime molds convert into a hardened, resistant structure. The fruiting bodies are small, reaching 1-3 mm in height. They are found in groups and have a varied assortment of color. (Martin 1969)

The purpose of this experiment is to compare spore morphology of six different species of slime molds using Scanning Electron Microscopes (T-1000 and S3400N Hitachi) and light microscopy and determine if SEM's can be used to classify species.

Table .1

Results	Size μm	Spiny	Warted	Rough	Smooth
<i>Arcyria</i>	9	0	3	3	0
<i>Cribraria</i>	4	5	5	5	0
<i>Metatrachia</i>	8	3	0	3	0
<i>Ceratiomyxa</i>	6.5	0	0	0	4
<i>Physarum</i>	9	4	0	4	0
<i>Dictydium</i>	7	0	5	3	0

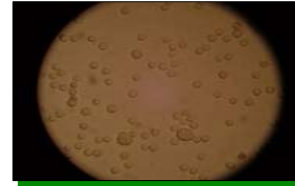
Examinations showed only three of the six species, (*Cribraria*, *Metatrachia*, *Physarum*), had sharp spines. Three of the six samples (*Arcyria*, *Cribraria*, *Dictydium*) had warts. *Cribraria* was the only spore with a smooth texture. The five remaining were rough textured with protuberances.

Methods & Research

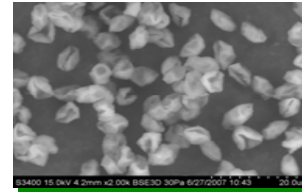
Six species of slime molds were collected from decaying logs at Big Thicket National Park. The entire sample was removed with a piece of bark to keep specimens intact. Specimens were placed in cardboard index boxes and labeled with site information and a collection number. Slime molds were classified according to genus & species using light microscopy and SEM's (T-1000 and S3400N Hitachi).

Two stubs with three samples/stub were used to examine the spores of six species. and observed by SEM's at 4000X magnification. The morphological findings were recorded and compared with light micrographs. (examples shown on right)

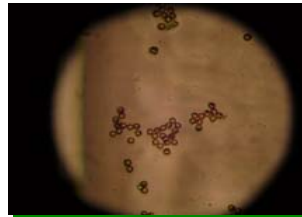
Spore surface characteristics were defined as; sharp spines, warts, smooth, and textured. The size was also determined . Variations were judged on a scale of 1-5, five being the most distinctive. (see Table .1)



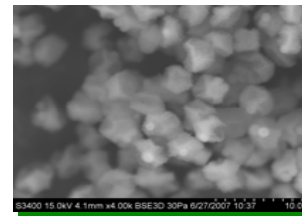
A. cinera
Compound microscope



A. cinera
SEM S3400N microscope



C. ferruginea
Compound microscope



C. ferruginea
SEM S3400N microscope

Discussion

Cribraria, *Metatrachia*, and *Physarum* had sharp spines on the surface on their spores, *Cribraria* had warts and had the smallest spores in the group.

In Contrast, *Metatrachia* lacked warts but was twice the size of *Cribraria*.

Physarum was distinguished from *Metatrachia* by having a spherical shape and a larger diameter while *Metatrachia* was elongated and oval shaped.

Ceratiomyxa was distinguished for being the only smooth spore.

Dictydium was distinguished from *Arcyria* by displaying more warts and having a rougher surface.

Arcyria was distinguished from *Dictydium* and *Cribraria* by its size and its smoother surface.

Conclusion

The results presented evidence of morphological differences among spores of different species. Finding also demonstrated that scanning electron microscopes can be used to classify species of myxomycetes based on spore morphology.

Literature Cited

- Stephenson, Steven L. 1994. *Myxomycetes, Handbook of Slime Molds*. Timber Press, Inc. Portland, OR
- Martin, G.W., Alexopoulos, C.J. 1969. *The Myxomycetes*, Iowa City Press, Iowa City, IA

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