MYXOMYCETES IN SOUTHERN ILLINOIS

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ABSTRACT.—This survey of southern Illinois Myxomycetes has resulted in a list of 78 species from the southern twelve counties. Among these are three new to the state of Illinois. These are *Badhamia lilacina*, *Stemonitis carolinensis*, and *Stemonitis webberi*. This brings the total number of Myxomycetes known from Illinois to 147.

While little study has been made on the Myxomycetes of Illinois (McCleary & Groeklags, 1965), even less has been done with the species which occur in the southern tip of the state. Benjamin (1956) reported 40 collections representing 24 species from the southernmost twelve counties of Illinois. A collection of about twenty species was obtained in the early 1940's by John McCree, a plant collector hired by the Works Progress Administration.

Later collections from southern Illinois were made by the late Dr. Leo Kaplan and Dr. Walter B. Welch, professors of Botany at Southern Illinois University. Mr. D. Wain Garrison, a former student at Southern Illinois University, made a number of collections from Jackson and Williamson Counties in 1957. All collections mentioned above except those by Benjamin are deposited in the herbarium of Southern Illinois University.

The bulk of this paper is based on a thesis (Folkerts, 1963) prepared for partial fulfillment of the requirements for the Degree of Master of Science in the Department of Botany of Southern Illinois University.

The area encompassed by this study includes the twelve southernmost counties of Illinois. These are Randolph, Jackson, Williamson, Saline, Gallatin, Union, Johnson, Pope, Hardin, Alexander, Pulaski, and Massac Counties.

Because of the infinite variety of possible habitats for Myxomycetes, no definite collecting stations were set up, although areas which proved productive were visited a number of times. Among these were the Pine Hills area near the small town of Aldridge in Union County, Giant City State Park near Makanda, located in southern Jackson County and northeastern Union County, and Thompson's Woods, located on the campus of Southern Illinois University, Carbondale.

Although collections were made in all months of the year, the most intensive collecting was done in the spring and summer because of the comparative abundance of fructifications during these seasons.

Some use was made of moist chamber technique in attempting to produce fructifications on various substrates. Plastic boxes measuring 3¼ x 2¾ x 1⅜" were used for the chambers. A thoroughly moistened piece of paper toweling was included to provide the needed humidity. Portions of bark from living trees, wood from decaying logs, and small quantities of decaying leaves and organic detritus were placed in the chambers until fructifications appeared. Moisture was added at intervals if deemed necessary.

Fructifications collected in the field were permanently placed in small boxes for storage in the herbarium. Toward the end of the study, it was found that the specimens were more easily taken out for examination if they were glued to a piece of stiff paper, rather than to the box itself.

The majority of collections were identified by the use of three works. These were *Monograph of the Mycetozoa*, 3rd edition (Lister, 1925), *Myxomycetes* (MacBride and Martin, 1934), and *North American Slime Molds* (Martin, 1949). The publication by Lister is uniquely useful because of the numerous excellent illustrations. The most complete work, and also the one with the most useful key, is that of Martin, which unfortunately contains no illustrations.

Ecology

Little has been written on the ecological relationships of slime molds, although some information can be obtained from lists of habitats or substrates on which the fructifications have been found. During the course of this study, careful notes were made on the type of substrate on which the fructifications were found, the amount of moisture present in and on the substrate, and the general ecological nature of the surroundings.

From the findings of this study, it is evident that Myxomycetes vary greatly in moisture tolerance, substrate specificity, and affinities for any certain ecological niches.

Attempts were also made to determine whether or not certain species produced fructifications at definite times of the year or in response to certain climatic conditions.

Since assumptions cannot be drawn about species collected only a few times, most of the ecological data are restricted to the common species (i.e., species whose fructifications were collected or observed at least fifty times during the course of this study).

The following summarizes some of the ecological data obtained:

Affinities for producing fructifications on the bark of living trees, *Licea biforis*; on decaying wood only, *Lycogala epidendrum*, *Dictydium cancellatum*, *Hemitrichia clavata*, *Hemitrichia stipitata*, *Ceratiomyxa fruticulosa*, *Comatricha aequalis*, *Arcyria denudata;* on decaying wood and organic detritis, *Calonema aureum*, *Oligonema schweinitzii*, *Diderma effusum;* on living herbs, *Physarum cinereum;* on a variety of substrates, *Fuligo septica*.

In southern Illinois, the best season of the year in which to collect slime molds appears to be the summer, especially during June and early July. Fructifications of most of the species included in this study can be observed at this time.

Few slime molds can be collected during the winter months. The only species which was noticed to produce fructifications during every month of the year was the trichiaceous *Calonema aureum*.

The conditions which induce the production of sporangia are probably variable from species to species, and little definite information is available on this subject. It does seem, however, that a period of drying immediately following an exceptionally wet period, accompanied by high temperatures, is the best time to expect the production of fructifications.

As is to be expected with any group of plants, some species are exceptionally common, and others quite rare. The following is a list of the ten most common species in southern Illinois, arranged with the most common placed first:

Hemitrichia vesparium
Hemitrichia stipitata
Lycogala epidendrum
Arcyria cinerea
Ceratiomyxa fruticulosa
Calonema aureum
Fuligo septica
Dictydium cancellatum
Physarum nucleatum
Stemonitis fusca

The apparent abundance of some of these species is probably due to the persistence of the sporangia. Fructifications of *Hemitrichia vesparium* may remain recognizable for several months after they are produced, whereas those of *Ceratiomyxa* and *Fuligo* usually disappear within a few days.

Four species were found in the attempts to produce fructifications on wood and detritis placed in moist chambers. These were *Arcyria cinerea*, *Licea biforis*, *Echinostelium minutum*, and *Cribraria minutissima*. Of these, *Cribraria minutissima* and *Licea biforis* were obtained only by the moist chamber method. The other two species were collected also in the field.

The following summarizes the species and the substrates on which they were found: *Echinostelium minutum* on *Ulmus americana*, *Quercus* sp., *Taxodium distichum; Licea biforis* on *Populus deltoides; Arcyria cinerea* on *Ulmus americana*, *Quercus* sp.; *Cribraria minutissima* on *Ulmus americana*.

By far the most abundant slime mold found by the moist chamber technique was *Echinostelium minutum*. Fructifications of this species may be produced on almost any piece of bark from *Ulmus americana*. Gilbert and Martin (1933) have pioneered in the field of moist chamber technique.

Annotated List of Species

The nomenclature for the taxa in the annotated list follows Martin (1949).

Counties from which specimens have been taken are listed following each species. A single asterisk (*) indicates the first report from southern Illinois. A double asterisk (**) indicates the first report from the entire state.

* *Ceratiomyxa fruticulosa* (Mull.) Macbr. Moist rotting logs in lowland areas. Alexander, Jackson, Johnson, Pope, Union.

* *Licea biforis* Morgan. Bark of *Populus deltoides* (in moist chambers). Jackson.

* *Tubifera microsperma* (Berk. and Curt.) G. W. Martin. Moist rotting wood. Jackson.

* *Lycogala epidendrum* (L.) Fries. Moist wood in almost any type of habitat. Alexander, Gallatin, Jackson, Johnson, Pope, Saline, Union, Williamson.

* *Lycogala exiguum* Morgan. Dead Wood. Hardin.

* *Dictydiaethalium plumbeum* (Schum.) Rost. Moist decaying wood. Union.

* *Enteridium rozeanum* (Rost.) Wingate. Moist decaying wood. Union.

* *Cribraria violacea* Rex. Dead wood, bark of living trees, on mosses. Union.

* *Cribraria minutissima* Schw. Bark of living trees, dead wood, on mosses. Jackson (in moist chamber).

* *Cribraria intricata* Schrad. Moist decaying wood. Pope, Williamson.

* *Dictydium cancellatum* (Batsch) Macbr. Moist decaying wood. Alexander, Jackson, Johnson, Pope, Williamson.

Echinostelium minutum DeBary. Decaying wood, bark of living trees, dung. Jackson, Johnson, Union (in moist chamber).

* *Perichaena chrysosperma* (Currey) Lister. Dead wood, dung. Jackson.

* *Perichaena depressa* Libert. Dead bark, decaying wood, detritis, dung. Gallatin, Jackson, Union.

* *Perichaena corticalis* (Batsch) Rost. Decaying wood and dung. Union.

* *Arcyria incarnata* (Pers.) Pers. Moist decaying wood. Jackson.

* *Arcyria magna* Rex. Wet decaying wood. Johnson. Reported by McCleary and Groeklags (1965) for the first time from Illinois (DeKalb Co.).

Arcyria cinerea (Bull.) Pers. Dead wood, plant debris, dung. Alexander, Jackson, Johnson, Massac, Pope, Union.

* *Arcyria insignis* Kalchbr. & Cooke. Dead wood, herbaceous stems. Pope.

* *Arcyria denudata* (L.) Wettst. Moist decaying wood. Gallatin, Jackson, Johnson, Pope, Union, Williamson.

Oligonema flavidum (Peck) Peck. Decaying wood. Pulaski.

* *Oligonema schweinitzii* (Berk.) G. W. Martin. Decaying wood, detritis. Alexander, Jackson, Massac, Saline.

Trichia varia (Pers.) Pers. Dead wood. Johnson, Pope, Saline, Union.

* *Trichia contorta* (Ditmar) Rost. Dead wood. Jackson.

* *Trichia scabra* Rost. Moist decaying wood. Gallatin, Hardin, Pope, Randolph, Union.

* *Trichia favoginea* (Batsch) Pers. Moist decaying wood. Johnson.

* *Trichia affinis* DeBary. Decaying wood, detritis. Jackson, Union.

* *Trichia persimilis* P. Karst. Decaying wood, Alexander, Jackson.

* *Hemitrichia serpula* (Scop.) Rost. Decaying wood and litter in moist ravines. Gallatin, Jackson, Saline, Union, Williamson.

* *Hemitrichia clavata* (Pers.) Rost. Moist decaying wood. Alexander, Jackson, Johnson, Union.

Hemitrichia stipitata (Massee) Macbr. Rotting wood and leaves. Alexander, Gallatin, Hardin, Jackson, Massac, Pope, Pulaski, Randolph, Union, Williamson.

* *Hemitrichia vesparium* (Batsch) Macbr. Decaying wood. Alexander, Gallatin, Hardin, Jackson, Johnson, Pope, Pulaski, Randolph, Saline, Union, Williamson.

Calonema aureum Morgan. Alexander, Jackson, Johnson, Pulaski, Saline, Union.

* *Diachea leucopodia* (Bull.) Rost. Fallen leaves and twigs, living plants. Jackson, Williamson.

Stemonitis fusca Roth. Decaying wood, leaves. Alexander, Gallatin, Jackson, Johnson, Pope, Union.

** *Stemonitis webberi* Rex. Dead wood. Jackson.

Stemonitis axifera (Bull.) Macbr. Johnson, Pope, Williamson.

* *Stemonitis smithii* Macbr. Decaying wood. Alexander, Pope. Reported by McCleary and Groeklags (1965) for the first time from Illinois (DeKalb Co.)

** *Stemonitis carolinensis* Macbr. Dead wood. Pope.

* *Comatricha nigra* (Pers.) Schroet. Decaying wood. Williamson.

* *Comatricha elegans* (Racib.) Lister. Decaying wood. Jackson.

* *Comatricha typhoides* (Bull.) Rost. Decaying logs, leaves. Jackson, Union, Williamson.

* *Comatricha aequalis* Peck. Moist decaying logs. Alexander, Jackson, Johnson, Union.

* *Lamproderma arcyrioides* (Sommerf.) Rost. Dead wood, plant detritis. Alexander.

Lamproderma arcyrionema Rost. Dead leaves, wood. Williamson.

* *Lamproderma scintillans* (Berk. & Br.) Morgan. Wood, decaying plant material. Jackson.

Macbrideola scintillans H. C. Gilbert. Bark of living trees (in moist chamber.) Union.

Macbrideola decapillata H. C. Gilbert. Bark of living trees (in moist chamber). Union.

* *Fuligo septica* (L.) Weber. Almost any type of substrate. Hardin, Jackson, Pope, Union, Williamson.

* *Fuligo cinerea* (Schw.) Morgan. Rotting vegetation, manure, bark of dead trees. Union.

Badhamia foliicola Lister. Dead wood, plant detritis. Jackson, Johnson.

** *Badhamia lilacina* (Fries) Rost. Decaying wood and herbs. Williamson.

* *Physarum cinereum* (Batsch) Pers. Decaying leaves, soil, living plants. Jackson.

Physarum bivalve Pers. Dead leaves, plant debris. Johnson.

* *Physarum globuliferum* (Bull.) Pers. Decaying wood. Pope.

* *Physarum pulcherrimum* Berk. & Rav. Decaying wood. Williamson.

* *Physarum stellatum* (Massee) G. W. Martin. Dead wood and decaying wood. Pope.

* *Physarum nucleatum* Res. Dead and decaying wood. Jackson, Pope.

* *Physarum pusillum* (Berk. & Curt.) G. Lister. Plant debris. Union.

* *Physarum tenerum* Rex. Decaying wood, twigs, plant debris. Hardin, Pope.

* *Physarum polycephalum* Schw. Dead wood, fleshy fungi. Gallatin, Jackson, Union.

* *Physarum nutans Pers.* Dead wood. Jackson, Johnson, Pope, Williamson.

Physarum viride (Bull.) Pers. Decaying wood, plant debris, old fungi. Alexander, Jackson, Johnson, Pope, Williamson.

* *Craterium leucocephalum* (Pers.) Ditmar. Decaying leaves, twigs, wood. Williamson.

* *Craterium minutum* (Leers) Fries. Decaying leaves, twigs, wood. Jackson, Union, Williamson.

Physarella oblonga (Berk. & Curt.) Morgan. Decaying wood, leaves, fungi. Alexander, Jackson, Johnson, Williamson.

* *Leocarpus fragilis* (Dicks.) Rost. Decaying leaves, twigs, wood, and living herbs. Williamson.

* *Mucilago spongiosa* (Leysser) Morgan. Dead wood and leaves, stems of living plants. Jackson.

* *Diderma globosum* Pers. Dead wood, twigs, living plants. Jackson.

* *Diderma testaceum* (Schrad.) Pers. Dead leaves, plant debris, fungi. Jackson, Pope, Union, Williamson.

Diderma effusum (Schw.) Morgan. Decaying leaves and wood, dung, living herbs. Johnson, Pope.

* *Diderma floriforme* (Bull.) Pers. Decaying wood. Gallatin, Jackson.

Didymium squamulosum (Alb. & Schw.) Fries. Decaying plant material, dung. Johnson.

Didymium melanospermum (Pers.) Macbr. Decaying wood, twigs, leaves. Williamson.

Didymium minus (Lister) Morgan. Decaying wood and plant material. Jackson, Johnson, Massac, Williamson.

Didymium nigripes (Link) Fries. Decaying plant material. Massac.

Clastoderma debaryanum A. Blytt. Decaying wood. Jackson.

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