1960

Fungi Living in the Guts of Arthropods

Robert W. Lichtwardt

University of Kansas

Follow this and additional works at: http://repository.uwyo.edu/jhrs_reports

Recommended Citation
Available at: http://repository.uwyo.edu/jhrs_reports/vol1960/iss1/12

This Research Project Report is brought to you for free and open access by Wyoming Scholars Repository. It has been accepted for inclusion in Jackson Hole Research Station Annual Report by an authorized editor of Wyoming Scholars Repository. For more information, please contact scholcom@uwyo.edu.
7. Although drought and snow have interfered with vegetational sampling, two additional sites were quantitatively sampled and others were studied by estimation methods. All sites were suitably marked so that they can be relocated. It is intended, weather conditions permitting, that this work will be continued through early September.

8. Some additional progress was made toward completion of a generalized vegetation map of the Lake Solitude basin.

9. Additional observations were made on the movement of large mammals in the region.

10. Approximately 100 additional plant specimens have been collected. Some of these were of species already collected in the area and are intended to supplement existing collections. It is probable that a few species not previously known from the Park have been collected; at least, they occur in no published lists.

Assisted by Charles Julienne and Toni Lincks.
Supported by the National Park Service.

Fungi Living in the Guts of Arthropods
Robert W. Lichtwardt
University of Kansas
Project Number 104

The purpose of working at the Station was to look for and study new species of fungi belonging to the Trichomycetes. The Trichomycetes are a group of fungi of unique habitat that live within the guts of living arthropods, where they attach themselves by means of a holdfast to the chitinous lining of the gut. One genus (Amoebidium) is attached to the host externally. Though they are intimately associated with their hosts, they all appear to live as obligate commensals rather than as strict parasites. None of the endocommensals has been cultured successfully outside of its host.

Very little really is known about these organisms, despite the fact that well over 100 species have been described and named. Nor are the relationships of these organisms with other fungi well established, except that they have characteristics that relate them to the Phycomycetes. Some French workers look upon the Trichomycetes as a separate class of fungi.

It was with very great satisfaction that I was able to find in the Jackson Hole area arthropods infected with some of the orders of fungi heretofore unreported from the Western Hemisphere. I worked primarily with aquatic insect larvae of Diptera, and infections were...
found in *Simulium* and various species of Chironomidae (*Tendipedidae*). Within the midgut of both types of insect larvae, attached to the peritrophic membrane, I discovered species of the unbranched genus *Harpella*, of the Harpellales. In the hindguts of these insects I also found species belonging to the branched order Genistellales. Sometimes one individual would be infected with species representing both orders of fungi.

A large number of these small Diptera larvae were dissected and slides prepared at the Station laboratory. Some populations proved to have a high degree of infection, while other populations, sometimes from different tributaries of the same stream, were virtually uninfected. Difficulties in species determinations of the larval hosts did not permit identifying the hosts as they were collected, consequently, the host specificity of the fungi has not been determined yet.

One structure of particular interest that I found, that has been reported from a few insects in France, is a body that appears to be a zygospore. Two species of Genistellales were found producing these structures. A careful investigation of these is currently under way, for if they are indeed zygospores, the affinities of the group to the Phycomycetes, and the Mucorales and Entomophthorales in particular, will be far more certain.

Two amphipods, common in the Jackson Hole region, were found to be infected with other Trichomycetes, these belonging to the order Eccrinales, and possibly to the genus *Enterobryus*. The hosts were *Hyalella azteca* (Saussure) and *Gammarus lacustris lacustris* Sars. The percentage of infected individuals, however, was low.

Many other arthropods, primarily aquatic, were dissected and found to be without infection. A list of these will not be included in this report.

Preserved specimens of many of the collections were brought to the University of Kansas, where they currently are being worked on. A great many interesting problems on the Trichomycetes still have to be investigated in the Jackson Hole area, working with fresh collections.

Supported by the National Science Foundation.