

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

The writer spent two weeks at the Station, from July 8 to 22. He was accompanied by Dr. Hiroharu Indoh, Professor of Botany at the Tokyo University of Education, who was in the United States for studies with the writer on the Trichomycetes. The joint studies were under the auspices of an NSF U.S.-Japan Cooperative Program (GF-148). Dr. Indoh's work was funded by the Japan Society for the Promotion of Science (Japan's equivalent of NSF in this instance) and the writer was supported financially by another grant for studies on Trichomycetes (NSF GB-2765).

Although the time spent at the Station was very short, it was possible to do some intensive work with very satisfactory results. Two previous periods of study at the Station (1960 and 1961) had permitted the writer to become familiar with parts of the Jackson Hole area and its possibilities for further studies. One of the several purposes of the investigation was to attempt to culture representatives of Trichomycetes that live within the guts of Diptera larvae. (When the writer was last in Jackson Hole, no endophytic Trichomycete had ever been cultured.)

It was possible to obtain ten axenic cultures of Trichomycetes:

- 1) Six isolates of Smittium culisetae Lichtwardt from mosquito larvae breeding in the willow flats below Jackson Lake Lodge;
- 2) Two isolates of Smittium sp. (representing a new species) cultured from mosquito larvae breeding in a cold (8°C) pool just below Togwotee Pass;
- 3) Two isolates of what is probably an undescribed species of Smittium from chironomid larvae in the stream that drains Two Ocean Lake.

These cultures are now available for experimental and comparative studies.

The axenic cultivation of several other genera of Trichomycetes from the hindgut and peritrophic membrane of Diptera larvae was attempted without success. It is hoped that the opportunity to continue this culture work at the Station will be available at a future date.

In addition to the culture work, further studies on the morphology and relationships of Trichomycetes to their arthropod hosts were carried out. New observations were made and the known host and geographical ranges were extended. The sexual process (zygospores) was discovered in one species of Genistellaceae that had previously been found by the writer in Jackson Hole and in Colorado; it is now evident that this represents a new genus of Trichomycetes. Since the time of the writer's previous visits to Jackson Hole he has had the opportunity to collect and study Trichomycetes in Colorado, California, Kansas, Hawaii, and Japan. Although the number of species is undoubtedly somewhat limited, Jackson Hole still remains one of the richest areas for studies on these unusual fungi, particularly those associated with Diptera larvae.