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A STUDY OF AQUATIC HYPHOMYCETES OF SOUTHEASTERN WISCONSIN

In 1942 the British mycologist C. T. Ingold discovered a curious group of fungi, the aquatic Hyphomycetes, which are now known to be an important part of the fresh-water microflora. They may be found on many forms of plant debris in streams, but are most common on decayed submerged leaves of deciduous trees and shrubs. According to Ingold (1966) and Nilsson (1964), aquatic Hyphomycetes are the principal agents of decay of submerged leaves in well-aerated streams. The spores (conidia) of these fungi may be found in foam, which acts as a spore trap on the water surface. In most aquatic Hyphomycetes the spores are tetra- or radiately branched.

This paper presents a portion of the results of a distributional and ecological study of aquatic Hyphomycetes in seven counties of southeastern Wisconsin. Results of the water chemistry studies and laboratory studies on the physiology of these fungi will be published separately in *Mycopathologia et Mycologia Applicata*. Part of this research was supported by a grant from the Graduate Faculty Research Committee.

The only previous study of this group in Wisconsin was by Woelkerling and Baxter (1968). The results of surveys in Wyoming and Oregon were reported by Baxter (1961, 1964). Previous extensive investigations of these fungi in the United States were conducted by Ranzoni (1953) and Peterson (1962, 1963). Studies of the aquatic Hyphomycetes on a worldwide basis were published by Nilsson (1964).

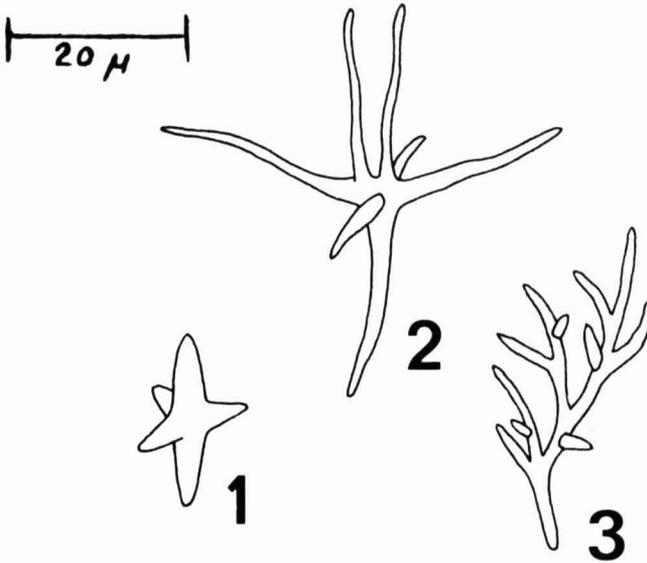
In the present investigation 28 species, representing 21 genera, were found growing on submerged decaying leaves in streams, lakes and bogs. Three previously undescribed species were found as loose spores in foam samples from Cedar Creek and Sauk Creek. In addition to the species previously reported from Wisconsin by Woelkerling and Baxter, the following species were collected and are listed as new records for the state. Those marked with an asterisk were collected at the UW-M Field Station.

<i>Dactylella submersa</i> (Ing.) S. Nilsson	<i>Culicidospora aquatica</i> Petersen
* <i>Alatospora acuminata</i> Ing.	* <i>Speiropsis irregularis</i> Petersen
<i>Centrospora angulata</i> Petersen	* <i>Casaresia sphagnum</i> Fragoso
<i>Heliscus lugunensis</i> Sacc. & Ther.	Spore of unknown species (Fig. 1)
<i>Actinospora megalospora</i> Ing	Spore of unknown species (Fig. 2)
* <i>Tetracladium maxilliformis</i> (Rostrup) Ing.	Spore of unknown species (Fig. 3)

During the present survey, eight species were found on leaves collected from the Root River, a stream with a relatively high level of pollution. Mycologists who have studied the aquatic Hyphomycetes are in agreement that the most abundant growth and widest range of species are found in clear, rapidly flowing streams with little or no pollution. It seems probable that some or all of the aquatic Hyphomycetes collected from the Root River had developed on leaves in tributaries before the leaves were carried downstream to the river.

Ranzoni (1953), Nilsson (1964) and others have stated that aquatic Hyphomycetes are usually more abundant on skeletonized leaves than on leaves in earlier stages of decay. During the present study leaves collected from East Twin River in Manitowoc County showed exactly the opposite situation. There was very sparse growth and sporulation on skeletonized leaves, even after the material had been kept in water in Petri dishes in the laboratory for three or four days. In contrast, some partially decayed leaves from this stream were supporting much more abundant development even when examined soon after being collected. One leaf of *Salix* sp., 28 mm. long and 8 mm. wide and in an early stage of decay, showed abundant growth and sporulation of *Flagellospora penicillioides* Ing., *Lemmoniera aquatica* de Wild., *Clavariopsis aquatica* de Wild., *Anguillospora longissima* (Sacc. & Syd.) Ing., *Tricladium angulatum* Ing., *Tetracladium marchalianum* de Wild., *Tetrachaetum elegans* Ing., *Triscelophorus monosporus* Ing., and *Alatospora acuminata* Ing.

This project included a survey of the aquatic Hyphomycetes occurring in the small intermittent stream at the UW-M Field Station. *Alatospora acuminata* was found to be the most common aquatic Hyphomycete in this stream. A study of the stream over a period of two years failed to reveal the dormant stage of this fungus. No sclerotial or perfect stages were found, and no isolates of the fungus were obtained from dead leaves collected from the stream bed during the late summer, autumn and winter months. Further studies of this problem will include growing the fungus in pure cultures from conidial isolates, followed by attempts to induce a sclerotial or sexual stage under controlled laboratory conditions.



Figs. 1-3. Spores of unknown aquatic Hyphomycetes.
 Fig. 1, from foam sample, Cedar Creek.
 Fig. 2, from foam sample, Cedar Creek.
 Fig. 3, from foam sample, Sauk Creek.

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