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TENDIPES PLUMOSUS (DIPTERA: TENDIPEDIDAE) AT SOLBERG LAKE, WISCONSIN

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In a recent issue of *The Michigan Entomologist*, Wilson (1969) reported on the behavior and abundance of a species of "*Chironomus*" on the shore of Solberg Lake, Wisconsin.

I have been able to examine about 100 of the specimens collected by Prof. Wilson. These were females and intersexes (but no males) of *Tendipes* (= *Chironomus*) *plumosus* Linnaeus. This is a common species, breeding usually in abundance below the thermocline of eutrophic lakes. Adults emerge from early spring to late fall, sometimes as stragglers and sometimes in bursts of huge numbers. Each lake has a different time for peak emergence, depending in part on its water temperature. The presence of intersexes in the collection received from Wilson, but no normal males, may account for his difficulty in getting a taxonomic determination, as intersexes do not agree with the taxonomic keys.

Intersexes of tendipedids are actually females but have morphological characters more male than female. They are caused by entry of a parasitic mermithid worm into a maturing female larva of the midge. The worm destroys the developing ovary and glutin gland of the larva but does not kill it. The larva pupates and matures into an adult with characters more like a male. The mermithid lies coiled in the abdomen of the adult midge. Destruction of the larval ovary causes development of male type of genitalia in the adult, more or less of the male ejaculatory duct, sometimes testes, and antennae with a hair brush somewhat like that of a male. These females with male characters retain some of the essential habits of females. Males of their own species recognize them as females and attempt mating with them. Further, the intersexes tend to fly out over lakes as in the egg-laying flights of normal females. The mermithid worm escapes from the body of an intersex flying out over a lake, and drops into the water to start the next generation.

The hundred or so specimens sent me by Wilson were females no longer containing eggs and intersexes no longer containing mermithids. This indicates that his collection was from specimens that had already made the egg-laying trip to the lake, the females to deposit eggs and the intersexes to lose their mermithids. The congregation on the beach described by Wilson was of spent individuals. This coincides with his mention of dead specimens. In a recent letter Wilson reported that in a random sample he counted 246 females and 252 "males". Since all "males" received from this lot are intersexes, the conclusion is that 50% of the females of the population were parasitized and became intersexes, and that no true males were present. Presumably the true males were roosting among trees and bushes farther from the beach, near sites normal for mating swarms.

Intersexes occur in many tendipedids that breed in lake bottoms but are commonest in the larger species of *Tendipes*. What is known about the biology of tendipedid intersexes is mostly from the work of Rempel (1940), who studied *Tendipes hyperboreus* Staeger intensively.

LITERATURE CITED

- Rempel, J. G. 1940. Intersexuality in Chironomidae induced by nematode parasitism. *J. Exper. Zool.* 84: 261-289.
- Wilson, L. F. 1969. Shoreline aggregation behavior of adults of a midge, *Chironomus* sp. (Diptera: Chironomidae) at Solberg Lake, Wisconsin, Mich. *Entomol.* 2: 14-19.