

## PARASITISM OF ADULT *Aedes vexans* BY A MERMITHID (NEMATODA: MERMITHIDAE) IN IOWA

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A recent paper by Ewing et al. (1989) gave the first published report of adult *Aedes vexans* (Meigen) being parasitized by mermithid nematodes in the USA. The mosquitoes were caught in light traps and a dog-baited live animal trap near Stillwater, Oklahoma, in 1983. Both types of traps were augmented by carbon dioxide. Identification of the worms could not be made because they were juveniles.

During a study of dog heartworm, *Dirofilaria immitis* (Leidy), infection in field-collected mosquitoes near Omaha, Nebraska and Council Bluffs, Iowa (Reardon 1978),<sup>2</sup> mermithids were observed parasitizing adult female *Ae. vexans* trapped near Council Bluffs, Iowa, in 1977. Because little is known about the occurrence of mermithids that mature in adult *Ae. vexans* in the USA and because of the interest in controlling this common pest mosquito of potential medical and veterinary importance, these observations are being reported.

representing 11 species were collected (Table 1). Each mosquito was dissected in a drop of saline on a glass microscope slide and the head, thorax and abdomen were examined under a dissecting microscope at 30× and a compound microscope at 100×. *Aedes vexans* was the second most common species caught and the only one parasitized by mermithids. Furthermore, the only parasitized specimens were collected near Council Bluffs, Iowa. Parasitized specimens were found on May 24, May 29 and August 8 (Table 2). While the overall infection rate near Council Bluffs was 8% (162 caught and 13 parasitized), and the rate for the combined catch in four traps on a given night ranged from 10 to 25%, the infection rate in a single trap on a given night was often higher. All infected mosquitoes collected on May 24 were in trap 1, where the infection rate was 13%. Three traps contained infected mosquitoes on May 29; traps 1 and 4 each had a 33% infection rate, and trap 3 had

Table 1. Incidence of mermithids in adult mosquitoes collected near Omaha, Nebraska, and Council Bluffs, Iowa, in 1977.

Species	Omaha		Council Bluffs	
	Examined	Parasitized	Examined	Parasitized
<i>Cx. salinarius</i>	612	0	96	0
<i>Ae. vexans</i>	281	0	162	13 (8%)
<i>Ae. trivittatus</i>	90	0	147	0
<i>Cx. tarsalis</i>	156	0	76	0
<i>Cx. erraticus</i>	0	0	52	0
<i>An. punctipennis</i>	3	0	20	0
<i>An. quadrimaculatus</i>	0	0	19	0

The following species combined represented about 1% of the total mosquitoes collected: *Ae. stimulans*, *Ae. dorsalis* and *Ae. triseriatus*; none was parasitized by mermithids.

Between May 24 and August 17 adult mosquito populations were sampled using CDC traps with carbon dioxide and light as attractants. Four traps were set up near Council Bluffs, Iowa, and six were set up near Omaha, Nebraska. The traps were placed at the edge of residential areas with potential mosquito producing sites less than 100 m away. A total of 1,736 mosquitoes

Table 2. Incidence of mermithids in adult *Ae. vexans* collected near Council Bluffs, Iowa, in 1977.

Dates collected	No. examined	Parasitized	
		No.	%
May 24	24	3	13
May 29	20	5	25
June 5	10	0	0
June 13	12	0	0
June 26	8	0	0
July 10	3	0	0
July 17	8	0	0
July 24	26	0	0
July 31	1	0	0
August 8	50	5	10
August 17	0	0	0
Totals	162	13	8

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<sup>2</sup> Reardon, T. P. 1978. Infection rate of dog heartworm in mosquitoes collected in the Omaha-Council Bluffs area. M.A. Thesis, University of Nebraska at Omaha, 39 pp.

an 18% infection rate. All (5) infected mosquitoes collected on August 8 were in trap 1, where the infection rate was 45%. Of the 13 infected mosquitoes collected during this study, 2 had one worm in the thorax, 10 had one worm in the abdomen, and one had 2 worms in the abdomen. The mermithids were sent to William Nickle, U.S. Department of Agriculture, Beltsville, Maryland, for identification. The specimens were larval stages and could not be identified precisely, but Dr. Nickle thought that they belonged to the genus *Perutilimermis*. It is highly probable that this mermithid is the same as the species parasitizing *Ae. vexans* in Oklahoma.

Although *Ae. vexans* was collected in small numbers (26 or less) each trap night near Council Bluffs (except August 8 when 50 specimens were trapped), it was the predominant species with a total of 162 (28%). Other species commonly found in the traps near Council Bluffs were *Aedes trivittatus* (Coquillett) 147 (25%), *Culex salinarius* Coquillett 96 (16%), and *Culex tarsalis* Coquillett 76 (13%). *Aedes nigromaculis* (Ludlow), *Aedes dorsalis* (Meigen), *Culex erraticus* (Dyar and Knab), *Anopheles punctipennis* (Say), and *Anopheles quadrimaculatus* Say made

up a combined total of 102 (17%). Species in this combined group were found only occasionally.

The 13 *Ae. vexans* that were recognized as parasitized had blood-fed and oviposited (ovarian tracheole endings were permanently stretched) prior to being caught in the traps. The infection rates may actually have been higher because not all of the *Ae. vexans* classed as nonparasitized had blood-fed before being collected and the mermithids, if present, may have been small and not readily apparent. Because of the low density of adult *Ae. vexans* and some of the high infection rates, it appears that this mermithid could be an effective control agent of this pest mosquito in certain areas near Council Bluffs.

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#### REFERENCE CITED

- Ewing, S. A., J. J. Petersen and J. S. Afolabi. 1989. Prevalence of parasitism of adult *Aedes vexans* by a mermithid (Nematoda: Mermithidae) in Oklahoma. *J. Am. Mosq. Control Assoc.* 5:106-108.