FIG. 2.—Living *Vorticella* attached to abdominal segments of a living *Culex pipiens* larva.

DISCUSSION. In this association of organisms, the advantage would seem to be with *Vorticella*. By clinging to mosquito larvae, *Vorticella* accompanies its host as it searches for food and air. This could mean that the *Vorticella* does not have to depend only on food being brought within reach of its radius of stalk expansion and contraction. This, in turn, could result in faster growth and reproduction as well as a means of transportation and spread to a new environment. Furthermore, attachment at the apparently favored sites between the longer hairs (figure 1) affords a certain amount of protection.

If, as we have said, there are advantages to *Vorticella* in the described relationship, there appear to be disadvantages to the mosquito larvae. Although it would seem to be beyond doubt that the high mortality in larvae infested with *Vorticella* must be a cause and effect relationship, more research is needed to determine if this is true and to find out how it operates and whether it can be manipulated to develop a biological control measure from it.

ACKNOWLEDGMENT. The observations described above were made in connection with the Suffolk County Mosquito Control Commission's continuing arbovirus surveillance program, in which the New York State Museum and Science Service and the New York State Department of Health are cooperating. The photomicrographs of *Vorticella* were made by the photography division of the Brookhaven National Laboratory.

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AERIAL FOGGING WITH BAY 39007 FOR THE CONTROL OF ADULT *Aedes sollicitans* (WALKER) AND *Aedes taeniorhynchus* (WIEDEMANN)

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Since Davis *et al.* (1960) demonstrated that aerial fogs of malathion were highly effective against salt-marsh mosquitoes, *Aedes sollicitans* (Walker) and *Aedes taeniorhynchus* (Wiedemann), this procedure has become one of the principal methods of applying insecticides from airplanes for control of adult mosquitoes in Florida. However, the need for additional insecticides that can be used as aerial fogs was emphasized by the report of resistance to malathion in *A. taeniorhynchus* in Florida (Glancey *et al.*, 1966). The objective of the tests described here was therefore to evaluate Bay 39007 (*o*-isopropoxyphenyl methylcarbamate) as an aerial fog against natural infestations of adult *A. sollicitans* and *A. taeniorhynchus*.

The insecticide was injected into the exhaust stack of a Stearman airplane owned and operated by the Brevard Mosquito Control District. The airplane was calibrated to deliver 150 gallons of liquid per hour and was flown at a height of 50–75 feet, at a speed of 85 miles per hour, and at swath intervals of 100 feet. The fogs were applied to 10 to 25-acre citrus groves near Titusville, Florida between 6 and 8:30 a.m. when wind speeds were less than 5 miles per hour at 6 feet above ground. By visual observations, fog coverage for each treatment was considered excellent.

A 10 percent oil soluble commercial formulation of Bay 39007 was used, either without dilution or diluted with No. 2 fuel oil to provide concentrations of 5 percent and 2.5 percent. Malathion, the standard for comparison, was diluted to 10 percent in No. 2 fuel oil containing 0.5 percent

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TABLE 1.—Control of adult salt-marsh mosquitoes with aerial fogs of Bay 39007 and malathion (average of two replications).

Insecticide	Concentration (%)	Pound of active ingredient per acre	Pretreatment count (mosq./man)	Percentage reduction after[a]— 6 hr	24 hr
Bay 39007	2.5	0.029	111	75	29
	5	.058	176	84	38
	10	.115	56	98	+7
Malathion	10	.115	47	41	26
None (untreated check)	....	.....	39	3	+2

[a] Plus indicates percentage increase.

sludge inhibitor (mixed amide amine oleate from modified fatty acids and polyamines).

The effects of the fogs were evaluated by counts of mosquitoes made the day before treatment and 6 and 24 hours after treatment at ten locations in each citrus grove by two observers standing side by side and facing in opposite directions. After 30 seconds, each man counted the mosquitoes on the front of his clothing and on the back of the other man's clothing. Counting stati ns were arranged in rows near the center of each grove at 90° angles to the flight swaths.

The results (Table 1) show that at a concentration of 10 percent Bay 39007 gave 98 percent reduction 6 hours after treatment; the 10 percent concentration of malathion gave only 41 percent reduction after 6 hours. Also, Bay 39007 produced 84 percent and 75 percent reduction at concentrations of 5 percent and 2.5 percent, respectively, 6 hours after treatment. No treatment gave satisfactory control 24 hours after application because of rapid reinfestation. The poor results with malathion were undoubtedly caused by the resistance of salt-marsh mosquitoes to this chemical (Glancey 1966); Davis (1960), in similar fogging tests with malathion in the same area but on much larger plots (180 to 900 acres), obtained reductions of 98 percent with a 10 percent concentration of malathion and 91 percent with a 5 percent concentration.

ACKNOWLEDGMENTS.—The authors wish to express their appreciation for the cooperation of John Sullivan of the Brevard Mosquito Control District, Merritt Island, Florida. Appreciation is also extended to H. R. Ford, K. F. Baldwin, and P. M. Bishop of the Gainesville Laboratory for their assistance in conducting these tests.

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SEE PAGE 549 FOR SYNOPSIS OF PROGRAM FOR 1968 ANNUAL MEETING OF AMCA IN NEW ORLEANS