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EVIDENCE FOR THE TRANSOVUM TRANSMISSION OF A CHIRONOMID ENTOMOPOXVIRUS[1,2]

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Previous studies of the epizootiology of an entomopoxvirus (EPV) in a nuisance midge species (*Chironomus decorus* complex) designated as *Chironomus* #51 (Biever 1965) have shown the virus to be an important regulatory factor (Harkrider and Hall 1978 & 1979). These studies have dealt with the most obvious method of transmission, the dissemination of virus inclusion bodies (IBs) in the environment. Once prevalent in the population, the virus probably is most often horizontally transmitted by healthy larvae feeding on IBs released from distintegrating, dead, infected larvae. However, it remains unclear how the EPV is introduced into an environment newly invaded by *C.* #51. Epizootics of EPV were observed in areas only inhabited by the midge larvae during the late summer months (Harkrider and Hall 1978). During this study 20 egg masses were collected in the field, before the appearance of the virus, and were reared in the laboratory. Eleven of these egg masses produced at least one EPV infected larva per egg mass. This suggested the possibility of transovum transmission of the chironomid EPV via a few individuals.

Vertical or transovum transmission has been demonstrated for a number of insect viruses, and it is an important mechanism for the maintenance of virus populations. For example, the demonstration of vertical transmission of the La Crosse virus in *Aedes triseriatus* (Watts et al. 1973) provided new insight into the overwintering of this pathogen.

This study was undertaken to demonstrate the possibility of vertical transmission of an EPV in midge populations under controlled laboratory conditions.

METHODS AND MATERIALS. Groups of *Chironomus* #51 larvae were exposed to 7.75×10^4 IBs/cm² EPV at different ages (24 to 120 hr) as reported by Harkrider and Hall (1979). The larvae were reared at high density (initial density was 7.5 to 8.4 larvae/cm²) in 250 ml rearing units. Adults emerging from these treatments were moved to fresh rearing containers and maintained at 25°C. Egg masses were collected from these adult holding units and moved to new 250 ml rearing units. Larvae hatching from these egg masses were reared at high density for 20 days in the manner described by Harkrider and Hall (1979). Surviving larvae were removed by flotation with concentrated $MgSO_4$ solution (Mulla et al. 1971) and examined for evidence of EPV infection.

RESULTS AND DISCUSSION. The data in Table 1 show that 8 of the 83 egg masses collected had larvae that developed infections with the EPV. Incidence of EPV disease among larvae was extremely low in all cases, with a maximum of only 6 infected larvae recorded from 1 unit. There was little pupal mortality noted and adult emergence in all units was high. The appearance of the EPV vertically introduced into the laboratory population is similar to the initial appearance of the virus in field populations (Harkrider and Hall 1978). Although EPV transmission by this method has little ef-

[1] Diptera: Chironomidae.

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Table 1. Transovum transmission experiments with the entomopoxvirus of *Chironomus* #51[a].

Larval age at EPV exposure (hr)	Number of egg masses		Avg. no. infected larvae/ egg mass
	Reared	Infected larvae	
Check	20	0	—
24	16	1	1
48	18	1	2
72	19	3	3.7
120	10	3	2.7
Total:	83	8	

[a] Egg masses were reared from an initial density of 7.5 to 8.4 larvae/cm^2 for 20 days.

fect on the first generation, the results indicate that transovum transmission, be it from virus on or within the egg, which was not determined, is a mechanism by which the pathogen can become established in a new environment.

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A SIMILARITY DENDROGRAM AS AN INDICATOR OF MOSQUITO BREEDING SITES

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In an investigation of effects of aquatic plants on mosquito oviposition and survival a similarity dendrogram using Hummon's (1974) similarity index was constructed for the composition of the aquatic vegetation of 9 permanent ponds in southern British Columbia where the mosquito faunas were surveyed regularly during 1975.

The dendrogram (Fig. 1) indicates that there is a relationship between the plant composition of each pond and the composition of its mosquito fauna. This points to the possibility of reducing unnecessary spray treatments by identifying through their plants which supposed mosquito breeding-grounds are in fact unsuitable.

The dominant and only form of vegetation in the Osoyoos pond, in which no mosquito larvae were found, was the alga *Chara globularis* Desv., which was not found in the other ponds. The dominant plant in the 2 Richmond ponds, which also lacked mosquito larvae, was duckweed, *Lemna minor* L. Both of these plants are suspected of containing compounds that affect both the egg-laying behavior and larval survival of mosquitoes (Angerilli, in preparation; Angerilli and Beirne, in preparation).

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