

Table 1. Rates of autogeny in four generations of *Aedes polynesiensis* Marks from Fiji.

Generation	Number of Females	Number of Females Laying Autogenous Eggs	Number of Females Autogenous upon Dissection	%Autogeny	\bar{X}_{Eggs} (S.E.)
1	50	21	6	54.00	12.86 (1.43)
2	50	3	1	8.00	7.00 (3.40)
3	11	2	*	18.18	15.50 (3.18)
4	4	1	*	25.00	16.00 (N/A)

* No females were dissected in the third and fourth generations.

As mentioned above, it appeared that the viability of the autogenous eggs was less than should be expected. During the course of the experiment, about 40% of the eggs hatched. Again, because the strain is well established in the laboratory, it is unlikely that the anautogenous females produce eggs with a similarly low rate of hatch. So, it is believed that the autogenous eggs have a lower rate of hatch than eggs produced by anautogenous females.

In summary, autogeny has been found to be present in a strain of *Ae. polynesiensis* from Fiji. A great deal of variation was seen in the percentage of the females in the population which produced eggs autogenously. In addition, autogenous females appeared to produce far less than a full batch of eggs, and the eggs are believed to have a comparatively low rate of hatch.

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THE POTENTIAL USE OF LARVAE OF *CHAOBORUS COOKI* SAETHER (DIPTERA: CHAOBORIDAE) AS A BIOLOGICAL CONTROL OF MOSQUITO LARVAE

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The predaceous larvae of *Chaoborus* species are planktonic and capture organisms by hanging motionless in the water column and lashing out sideways at passing prey. Larvae in ponds feed on such invertebrates as chironomid and culicid larvae, cladocerans and copepods.

The potential use of *Chaoborus* larvae as biological control agents of mosquito larvae has been investigated both in the laboratory and in nature (James and Smith 1958, Montchadsky 1964, Nikolaeva 1979, Sailer and Lienk 1954, Skierska 1969, 1974, Twinn 1931). Because most species are restricted to permanent water where large numbers of pest mosquito species rarely occur, these are of limited use as a biological control.

During a revision of *Schadonophasma (Chaoborus)*, Borkent (1979) discovered that *Chaoborus cooki* overwintered in the egg stage in seasonally temporary woodland ponds in the Nearctic region. In Alberta, Canada, 1st instar larvae hatched in early spring while surface ice still formed overnight, generally about the 2nd

or 3rd week of May. These larvae reached adulthood by late June or early July. Females produced desiccation resistant, diapausing eggs with a highly sculptured exochorion, obvious adaptations to temporary pond existence. This apparently unique adaptation (shared by *C. nyblaei*, a Palearctic species) in the genus places larvae of *C. cooki* in the same habitat as some mosquito species and especially those of the genus *Aedes*.

I was able to observe both in nature and the laboratory that *C. cooki* larvae readily consume culicid larvae. For example, at a site 1.6 km south of Jasper, Alberta a mosquito hatch was directly observed to be devoured by *C. cooki* larvae and subsequent sampling of the pond failed to reveal any mosquito larvae.

Predation of mosquito larvae was observed throughout the study period (3 yrs.) in early spring and after heavy rains in a number of localities in Alberta (Borkent 1979). I regularly collected *C. cooki* at those times with mosquito larvae in their crops.

The purpose of this paper is to point out the potential use of *C. cooki* larvae as a biological control of those early season mosquitoes which occur in the boreal areas of temperate regions. Only the basics of the life cycle were determined by Borkent (1979), and many more data need to be obtained before any practical application can be made of *C. cooki*. Numbers of mosquitoes consumed, duration of each larval instar, effectiveness of predation at varying prey densities, adult behavior and the nature of egg diapause are all aspects which need to be investigated. It is hoped therefore, that some researcher or organization will be able to further investigate the potential of *C. cooki*.

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ELAPHRUS CUPREUS DFSCH. (COLEOPTERA, CARABIDAE), A PREDATOR OF THE PUPAE OF BITING MIDGES (DIPTERA, CERATOPOGONIDAE)

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Very few observations on insect predators of ceratopogonid pupae have been reported. In his review of literature of natural enemies of biting midges, Wirth (1977) cites only one case: Yaseen (1974) observed in Trinidad (West Indies), adults of the tiger-beetle *Cicindela suturalis* F. feeding on pupae and adults of *Culicoides phlebotomus* (Williston).

At a breeding place near Ichtratzheim (France), consisting of a mud-bank next to a river, where we are studying the spatial distribution of biting-midge larvae, we noticed that the number of *Culicoides* which emerged was more than 3 times lower than that obtained from mud samples kept in the laboratory (Rieb & Kremer). We considered that the activity of a predator could explain partly the diminution of the yield in the field. During the summer of 1979, we discovered by careful observations, the presence of a beetle: *Elaphrus cupreus* Dfsch. It is found on the surface of mud, in