

Other mosquito predators

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Pupfish

Photo by Laurel Walters

Work by Fred Legner, Professor of Entomology, University of California, Riverside, indicates that the native desert pupfish, *Cyprinodon macularius*, may be better for suppressing mosquitoes in some habitats than the extensively used mosquito fish. In controlled pond culture studies, the pupfish reduced mosquito larvae significantly. All mosquito breeding ceased in test ponds four weeks after pupfish were introduced, while mosquito breeding continued in large ponds stocked with mosquito fish. Pupfish also significantly reduced some chironomid midge larvae in both large and small ponds. The pupfish, because of its minimal fish-feeding behavior, may be preferable to mosquito fish in habitats harboring other native fishes. It is tolerant of saline water and can withstand temperatures from freezing to 115° F. The species is found in much of the lower Colorado Desert area of California and Arizona, in irrigation drains, canals, and estuaries. Pupfish are difficult to catch in the wild and to rear, and the California Fish and Game Department currently prohibits their introduction into areas other than their present location.



Hydra

Fresh-water hydra have been shown to feed on laboratory mosquito cultures in University of California research by Dr. Legner and by Dr. Howard M. Lenhoff at Irvine. In preliminary field studies conducted to date, hydra showed potential as biocontrol agents against *Aedes nigromaculis* and *Culex tarsalis* larvae.

Researchers believe hydra could be useful mosquito predators in fresh-water sloughs, rice fields, roadside ditches, catch basins, agricultural and construction drainage depressions, borrow pits, canal seepages, treated sewage effluents, and snowmelt pools. They can be mass-produced easily and can be confined at high density without danger of cannibalism. Hydra produce

semidormant, encased embryos, which can be stored and used as conveniently as chemical pesticides. They remain and reproduce where they are released. Hydra can kill organisms larger than themselves and are not solely dependent upon mosquito larvae as a food source for survival. Unlike other control organisms, some species kill many more prey than they are able to ingest. Hydra can be used in waters that are too shallow or too temporary for fish that feed on mosquito larvae.



Flatworms

Photo by Max Badgley

Several species of free-swimming flatworms can help control mosquito larvae. In laboratory studies by Dr. Legner, two of them proved to be tolerant of alkalinity, salinity, and decaying organic matter, and one, *Dugesia dorotocephala*, reduced *Culex* larva populations in experimental ponds by more than 90 percent. In a subsequent study, the predator provided good control of three *Culex* species.

Although flatworm species are widespread in North America, some are highly cannibalistic and might be unsuitable for mass-rearing. Dr. Legner's research indicates that adequate numbers of *D. dorotocephala*, a non-cannibalistic strain, can be produced in southern California for practical mosquito abatement if cultures are stockpiled during winter months.

