

**ANALYSIS OF LARVIVOROUS POTENTIAL OF THREE FISH  
SPECIES AGAINST *Aedes* MOSQUITO LARVAE  
(DIPTERA: CULICIDAE) IN LABORATORY CONDITION**



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## ABSTRACT

The mosquitoes *Aedes aegypti* (Linnaeus 1762) and *Aedes albopictus* (Skuse 1894) are the main vectors of Dengue virus, Chikungunya virus, and Yellow fever virus and Zika virus around the world. Biological control is a method to control the pest population using other living organisms. Larvivorous fishes feed on immature stages of mosquitoes and extremely effective at diminishing mosquito larval populations. Three freshwater larvivorous fish species were used (*Poecilia reticulata*, *Gambusia affinis*, and *Aplocheilichthys parvus*) in this study to identify their potential in control of *Aedes aegypti* and *Aedes albopictus* larvae under laboratory conditions. Ovitrap surveillance was carried out to collect the larval stages. All three adult mosquito larvivorous fish species were collected in Batticaloa District, Sri Lanka. The water parameters of fish habitat were measured during the collection of fish. Identification of mosquitoes, fish species and the experiments were carried out in the Department of Zoology, Eastern University, Sri Lanka. All three fish species were reared in the three separate experimental glass tank for seven days of acclimatization period. The experiments were conducted in separate glass tanks contained 28 liters of dechlorinated well water. Different gender compositions of all three fish species were fed by mixture of three hundred 3<sup>rd</sup> and 4<sup>th</sup> instar larvae stages of *Aedes aegypti* and *Aedes albopictus* mosquito species under laboratory conditions. The number of larvae consumed in every 10 min, 20 min, 30 min, 1 hour, 2 hours, 5 hours, 8 hours and 24 hours were counted. Five replications were conducted for each trial of all three fish species. The one way un-stacked ANOVA ( $p < 0.05$ ) was performed by MINITAB, 2014 to find out the statistical significance of the larvivorous feeding potential among the different gender compositions of all three fish species. The *Aplocheilichthys parvus*, *Gambusia affinis* and *Poecilia reticulata* showed a considerable larvivorous potential against the *Aedes* mosquito larvae. The average larval consumption of all three fish species among the different gender compositions within 24 hours followed as *Aplocheilichthys parvus* > *Gambusia affinis* > *Poecilia reticulata*. The females of *Aplocheilichthys parvus* ( $175 \pm 10.32$ ) and *Gambusia affinis* ( $171 \pm 9.62$ ) are very active predators than the *Poecilia reticulata* ( $103 \pm 5.72$ ). The males of *Poecilia reticulata* ( $61 \pm 3.76$ ) and *Gambusia affinis* ( $77 \pm 4.02$ ) consumed lower number of *Aedes* larvae. But males of *Aplocheilichthys parvus* ( $102 \pm 5.04$ ) had higher preference than other males. Female and male companions consumed higher number of larvae. Among the fish species, *Aplocheilichthys parvus* ( $283 \pm 18.575$ ) companions had a higher feeding efficiency against *Aedes* larvae than the *Gambusia affinis* ( $208 \pm 12.175$ ), and *Poecilia reticulata* ( $166 \pm 10.867$ ). Results concluded that all three fish species are efficient predators on *Aedes* larva under laboratory condition. Therefore these fish species can be utilized as an environmental friendly dengue mosquito integrated control management.

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