Section D

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A preliminary study on the role of *Gambusia affinis* (mosquitofish) in mosquito control and its habitat preferences in a selected canal system of the Sri Jayewardenepura area

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Mosquito borne diseases are a major problem in all tropical and subtropical countries. Use of biological control agents in mosquito control is a popular method for which *Gambusia affinis* is widely used. However, it is also considered as a pest in many waterways around the world following initial introductions early last century as a biological control agent for mosquitoes. This species is well established in many natural ecosystems of Sri Lanka but its significance as a biological control agent of mosquitoes in these natural ecosystems or whether it has become a pest in our waters is poorly investigated. The present study investigates the role of *Gambusia affinis* (mosquitofish) in mosquito control and its habitat preferences in a selected canal system of the Sri Jayewardenepura area. A total of 8 selected locations in flowing and stagnated waters in the canal were sampled once in two weeks over a period of 10 months (October 2010 to June 2011). The results revealed that *G. affinis* plays a role as a biological control agent in controlling mosquito larvae only in extremely stagnant waters. According to stomach content analysis, *G. affinis* consumes larvae of *Culex quinquefasciatus, C. gelidus* and *Mansonia* sp. occurring in this canal. According to the statistical analysis (ANOVA), fish distribution between locations shows no significant difference during the study period ($p > 0.05$) indicating that they do not have habitat preferences. They can withstand unfavorable environmental conditions such as high nitrate levels (12.98 mgl^{-1}– 20.6 mgl^{-1}), low dissolved oxygen levels (3.96 mgl^{-1} – 4.53 mgl^{-1}) and moderate biological oxygen demand levels ((2.64 mgl^{-1} – 3.339 mgl^{-1}). Their ability to withstand such extreme habitat conditions is one of the main reasons leading to their successful wide distribution in the canal. Another interesting observation made in this study was that there are only two species of fish occurring, namely *G. affinis* and Tilapia (*Oreochromis mossambicus*) in the study area. Both being introduced species, the absence of endemic or indigenous fish species in this canal system may be an indication of the adverse effects of these two introduced fish species on other fish. Or, it could be due to the fact that the endemic or indigenous fish species that are usually habitat specialists could not survive in this canal with unfavorable environmental conditions that were evident, whereas both the species, *G. affinis* and *Oreochromis mossambicus* present are highly adaptable to such conditions. This aspect however needs further investigation.

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