The impact of three invasive alien fish species on the survival and larval production of *Poecilia reticulata* under laboratory conditions

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Interactions of native with non-native species rank second only to habitat modification as a threat to freshwater fish biodiversity in the world. These impacts of exotic fish populations may arise from predation, competition for resources, habitat and water quality alterations, hybridization, and importation of parasites and diseases. Aquaculture is the major industry that has introduced number of exotic fish species into freshwaters of Sri Lanka during last few decades. Although aquaculture confines fish in to reservoirs, ponds, cages, or tanks, accidental and intentional releases into natural waters are not uncommon. Perceptions of impacts of these introduced fish species on native fish fauna vary widely. Thus, a pilot scale laboratory study was conducted to investigate impacts of three introduced fish species, *Oreochromis niloticus*, *Helestoma teminkii* and *Trichogaster tricopterus* on *Poecilia reticulata*, another common exotic fish found in natural freshwater habitats in Sri Lanka. *P. reticulate* was selected for the study considering its smaller size (equivalent to other fish larvae), easiness to breed, rare in captivity and its availability in large numbers. It was further decided not to sacrifice large number of native fish or fish larvae in this pilot study. Study was conducted from June to August, 2014 in twelve glass aquaria with a size of 90x30x30 cm. Ten healthy and mature *P. reticulata* fishes (length 1.85±0.18 cm; width 0.3±0.03 cm) with male to female ratio of 2:3 and 20g of *Hydrilla* were introduced to all experimental tanks. Females without swollen bellies were only selected in the study. ExperimentI (EI): *H. teminkii* (length 15.5±0.43 cm; width 7.1±0.17 cm); one fish a tank; Experiment2 (E2): *T. tricopterus* fishes (length 6.5±0.5 cm; width 3.4±0.3 cm); three fishes a tank; Experiment3 (E3): *O. niloticus* (length 6.5±0.5 cm; width 3.4±0.3 cm); three fishes a tank. All experiments were conducted in triplicate. Three tanks only with guppy and *Hydrilla* were controls. Water quality parameters such as DO, temperature and pH were measured in all experimental tanks once a week. Fish were fed twice a day using a commercial fish feed, excess feed and fish excreta were siphoned out. Half of the water in tanks was exchanged with aged tap water twice a week. Fish behavior and emergence of guppy larvae were monitored daily. Larvae born in each tank were counted and removed twice a week. Water quality parameters measured were not significantly different among tanks (one way ANOVA, $p>0.05$). Average DO, pH and temperature in tanks were 8.4±0.31 mg/L,7.7±0.12 and 28.7±0.3 ^{0}C, respectively.*O. niloticus* chased and predated on all guppies introduced in E3 within an hour of introduction. Guppy larvae were observed in E1 and E2. Total number of larvae recorded in E1, E2 and control were 38, 15 and 39, respectively at the end of experimental period. Larval counts were significantly higher in control and E1 than E3 after experimental period (one way ANOVA, $p<0.05$). Larval numbers recorded in E2 decreased in consecutive days indicating predatory behavior of *T. tricopterus*. Number of larvae in E1 and control tanks did not decrease in consecutive days indicating non predatory behavior of kissing gouramy. *O. niloticus* showed high carnivorous behavior towards adult guppy and *T. tricopterus* fed only on larvae. *H. teminkii* had no impact on survival or reproductive output of *P. reticulata*. Research is warranted to study impact of *O. niloticus* and *T. tricopterus* on other fish species in wild environment.

Key Words: Invasive fish, *Oreochromis*, *Helostoma*, *Trichogaster*, fish larvae
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