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EFFECT OF SELECTED WATER QUALITY PARAMETERS ON THE PREVALENCE OF *Poecilia reticulata* (GUPPY) POPULATION IN SRI JAYEWARDENEPURA CANAL SYSTEM

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Abstract

Present study was carried out to determine the effect of some selected water quality parameters on the prevalence of *P. reticulata* population in Sri Jayewardenepura canal system which is a heavily polluted urban water body where *P. reticulata* is abundant. Fish and water samples were collected once a month in 6 sampling locations from January 2016 to December 2017. Water quality parameters investigated were pH, Dissolved Oxygen (DO), Biochemical Oxygen Demand (BOD), Electrical Conductivity (EC), Temperature, Hardness, Alkalinity, Nitrate-Nitrogen (NO_3-N) and Phosphate (PO_4^{3-}). Water flow rates and water depths of all sampling points were recorded. Total lengths (mm) and total weights (g) of all specimens (n-520) were measured and their relative densities were calculated. *P. reticulata* was the most abundant species in all investigated sites but high densities were recorded at slow moving and stagnated shallow waters (mean flow rate 0.011 ± 0.009 - 0.056 ± 0.064 m/s and mean depth 1.02 ± 0.48 - 0.34 ± 0.10 m). Environmental parameters revealed that all the sites were subjected to moderate or high pollution and most conspicuous were the low DO (ranged between 0.83±0.12-4.84±0.76 mg/l) and high BOD (1.78±0.4-9.10±0.6 mg/l) levels. While DO has reached levels potentially harmful for fish, BOD levels indicated organic pollution. Polluted water quality of studied locations were further confirmed by high values for NO_3-N (3.9±0.8-11.5±1.2 mg/l), PO_4^{3-} (1.9±0.4-3.9±0.3mg/l), EC (257.6±12.8-801.6±42.0µs/cm), Hardness (80.0±10.4-113.3±13.1 mg/l) and Alkalinity (70.7±11.5 - 179.6±20.4 mg/l). Despite the fact that the locations were polluted, relative densities (32.7±27.7 - 85.7±22.9) of *P. reticulata* were considerable in all locations indicating their ability to breed and survive even in extremely adverse environmental conditions. The results of the study showed that the relative densities of *P. reticulata* significantly varied with some of the environmental factors; decreasing with increasing DO, NO_3^- N, PO_4^{-3} levels ($P \leq 0.05$) as well as with water depths and flow rates of water and increasing with increasing pH, BOD and Alkalinity of water. Significant sexual dimorphism (2 females :1male) in terms of both body weight and length ($p = 0.000$) were found. The study recorded that the average adult sizes of fish were smaller (Female-35 mm, Male-25 mm) than previous records (i.e. Female- 60 mm, Male- 40 mm) in the present study area. This study concludes that, although the adverse environmental conditions are affecting their growth rates and relative densities, they are able to survive and breed in such ecosystems.

Keywords: Guppy, Water quality parameters, Polluted water, Fish density