Feasibility Study on the Propagation of *Poecilia Reticulata* (Guppy) in Semi-Natural Aquaria in Vavuniya, Sri Lanka

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Abstract: Sri Lanka gains foreign exchange by involving the ornamental fish trade, and guppy fish play a major role in this trade. As Vavuniya is subjected to high water hardness, it is favourable for live-bearer fish propagation, such as guppy farming. Therefore, this study investigates the possibilities of *Poecilia reticulata*(guppy) propagation in semi-natural aquaria with cost-effective diets and a hard-water environment. There were ten pairs of guppies acclimated to the five semi-natural aquaria for the propagation of larvae. Preliminary studies conducted with low water hardness (50mg/L) showed a survival rate of 75%, with most deaths occurring in the initial weeks. To assess the influence of high water hardness, the rest of the aquaria setups were tested with hardness above 500mg/L using formulated cost-effective diets such as fish meal, soybean meal, compared with commercial feed as a control. Weekly monitoring revealed that high water hardness (500-750mg/L) seems to improve the survival rate (100%) at initial weeks compared to low hardness conditions and showed a positive feeding behaviour towards the formulated diets. Additionally, comparisons of different formulated diets, soybean meal along with higher water hardness levels seemed to enhance health and growth performance than softer water conditions. These findings indicate that maintaining higher water hardness is crucial for optimizing guppy larvae survival. Therefore, this study suggests that both water hardness and cost-effective diets are important for sustainable guppy farming practices in Vavuniya, Sri Lanka.

Keywords: Aquaculture, Formulated diets, Larval growth, *Poecilia reticulata*, Water hardness

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