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Introduction of *Wolffia* sp (Duck weed) to reduce toxic un-ionized ammonia (NH_3) in *Poecillia reticulata* (Guppy) grow out tanks

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Maintaining water quality is one of the key issues in the ornamental fish culture industry which is mainly driven by small-scale farmers. The effect of Duckweed (DW) in reducing toxic un-ionized ammonia (NH_3) in Guppy grow out tanks was determined using six rectangular cement tanks (0.75 m^3). Mildly fresh cow dung (400 g) was provided to each tank as an initial dosage of organic manure and partial amounts (200 g) were added every 10th day. Three randomly selected tanks were treated with 350 g of DW respectively. The remaining tanks were kept as controls. These tanks were stocked with the Guppy (*Poecillia reticulata)* with a stocking density of 350 fry m^{-3} after 7 days. The fish were fed with a commercial feed (Cf) (5% of body weight) and these amounts were adjusted through bi-weekly sampling of fish. Temperature, pH and Total Ammonia Nitrogen (TAN) were measured in each tank and the NH_3 concentration was calculated. The trial lasted 36 days. The Average Daily Growth (ADG), Specific Growth Rate (SGR), Condition factor (CF), Weight gain (WG) and % survival of the fish in DW provided tanks 0.0072 ± 1.1011 g day^{-1}, 5.3132 ± 0.9521, 1.4570 ± 0.1166, 0.1877 ± 0.0285 g and 79.0 ± 7.55 respectively) were not significantly different to the corresponding values for fish in tanks without DW (0.0067 ± 0.0008 g day^{-1}, 5.2045 ± 0.9018, 1.4167 ± 0.0965, 0.1763 ± 0.0222 g and 70.3 ± 12.83 respectively). The values of DW provided tanks were higher than the tanks without DW but were not significantly different ($P > 0.05$).TAN and NH_3 in DW provided tanks (0.1248 ± 0.0628 and 0.0123 ± 0.0117 mg l^{-1}) were lower than the tanks without DW (0.185 ± 0.110 and 0.0148 ± 0.0108 mg l^{-1}) but not significantly different ($P > 0.05$). Student T-tests were used to determine the significance at a 5% level ($p < 0.05$). The mean values of pH in DW provided tanks and tanks without DW were 8.05 ± 0.0711 and 8.00 ± 0.0144 respectively and the temperature was 28 ± 1.23 ℃ in both experimental set ups. The lower values for NH_3 in DW provided tanks indicate that DW has an effect on the reduction of NH_3. As NH_3 could reduce the growth performance and % survival of fish, DW could be used in Guppy grow out tanks to reduce the amount of NH_3 and avoid the reduction of their growth performance and % survival. Accordingly, small scale farmers are encouraged to use DW in Guppy grow out tanks to reduce toxic ammonia levels. In this experiment the added amount of DW might not be sufficient to have a significant difference in reducing NH_3 and the growth performance and % survival of fish. Future research is needed to determine the necessary amount of DW that should be used in grow out tanks.

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