(232)

Evaluating the Efficacy and Safety of Clove Essential Oil as a Sedative for Long-Term Transportation of *Xiphophorus helleri*

Parindya, P.W.D.[1*], Bandara, A.M.K.A.[2], Rathnapala, J.M.S.N.[3], Costa, A.M.K.C.J.[4]

[1,2,3] Department of Fisheries and Aquaculture, Faculty of Fisheries and Marine Sciences & Technology, University of Ruhuna, Matara, Sri Lanka.
[4]Department of Limnology and Water Technology, Faculty of Fisheries and Marine Sciences and Technology, University of Ruhuna, Matara, Sri Lanka.
[*]dilukshiparindya555@gmail.com

Abstract

Sedative agents are effective additives to be used during long-term live-fish transportation, mainly in the ornamental fish sector to relieve stress and ensure fish welfare. The current study, which included two phases, investigated the effectiveness and safety of clove (*Syzygium aromaticum*) essential oil (CEO) during the long-term transportation (24 h) of *Xiphophorus helleri* (Swordtail). Phase I of the experiment was conducted to evaluate the efficacy and safety of CEO added to the transportation water at four concentrations (0, 5, 10, and 15 mg/L). During this phase of the experiment, a long-term transportation scenario of 24 h in sealed plastic bags was simulated under laboratory conditions. Then, sampling was carried out immediately before transportation, immediately after transportation, and 96 h post-transportation to find out differences in water quality parameters (temperature, pH, ammonia concentration (AMC), and dissolved oxygen concentration (DO)), blood glucose level (BGL) in fish, and survival percentage of fish between the treatments. Our results showed that the water quality was reduced after 24 h of transportation simulation as indicated by significantly lower DO, pH, and significantly higher AMC measured at 24 h compared to the measurements taken just before transportation. Moreover, transportation caused stress in the fish as perceived by the elevated BGL in fish at the end of the transportation. Interestingly, the use of 10 mg/L CEO offered the most favourable results as indicated by significantly higher DO and significantly lower AMC and BGL in this treatment compared to 0 mg/L CEO treatment immediately after transportation. However, there was no significant difference in the mean survival percentages of the treatments. Phase II of the experiment tested the effect of ethanol, used as the solvent for CEO in Phase I. The 10 mg/L CEO concentration, identified as the most effective and safe in Phase I, was compared with a treatment containing only 96% ethanol, the solvent used for CEO. According to phase II findings, there is no interference in the use of ethanol as a solvent for CEO in Phase I. In conclusion, clove oil shows promise for use in the long-term transportation of live *X. helleri* due to its sedative properties, which help reduce water quality deterioration and stress levels in fish.

Keywords: *Ornamental fish, Syzygium aromaticum oil, Blood glucose level, Water quality, Additives*