

Efficacy of selected plant extracts as anesthetic agents during packing of *Oreochromis niloticus* and *Cyprinus carpio*

H.M.T.S. Wijewardana^{1*}, T.V. Sundarabharathy¹ and W.P.R. Chandrarathne²

¹Department of Biological Sciences, Rajarata University of Sri Lanka, Mihintale, Sri Lanka

²National Aquaculture Development Authority of Sri Lanka

Transportation exposes fish to a series of stress stimuli which cause fish mortality. Anesthetic agents are used in aquaculture to reduce the stress in fish. Plant materials as anesthetic agents have a great avenue in aquaculture sector. The study was focused to evaluate the efficiency of *Derris scandense* (Kalawel), *Tephrosia vogelii* (Fish-poison bean) and *Barringtonia racemosa* (Medella) as anesthetics during transportation of a food fish (*Oreochromis niloticus*) and an ornamental fish (*Cyprinus carpio*). Extracts of each plant were prepared by grinding 50 g of plant material with 500 mL of water and filtering. Complete Randomized Block Design and one way ANOVA were used. Two experiments were conducted each with three replicates. First experiment was on induction time, recovery time and water quality parameters when packing of fish with five concentrations of each plant extract, *D. scandense* - 1.5, 2, 2.5, 3, 3.5 mL/L; *T. vogelii*-0.25, 0.5, 0.75, 1, 1.25 mL/L; *B. racemosa* 45, 46, 47, 48, 49 mL/L. Ten fingerlings of each species/treatment/replicate, *O. niloticus* (3.54±0.49 g and 46.05±2.72 cm) and *C. carpio* (3.92±0.52 g and 49.61±2.02 cm) were used. Most effective anesthetic concentration of plant extracts were compared with MS222 (65 mL/L) and clove oil (3 mL/L) in second experiment. Lowest induction time was 7.39±1.22 min at 1.25 mL/L and lowest recovery time was 19.41±1.5 min at 0.25 mL/L were exhibited by *T. vogelii* for *O. niloticus*. Highest induction time and recovery time periods for *C. carpio* was exhibited by *B. racemosa* with 77.29±1.61 min at 45 mL/L and 130.37±0.77 min at 49 mL/L respectively. Water quality parameters were within the acceptable range for aquaculture. The anesthetic properties of *T. vogelii* were similar to that of clove oil at 3 mL/L and MS222 at 65 mL/L. Induction time and recovery time of *D. scandens* and *B. racemosa* were longer than that of clove oil and MS222. Anesthetic properties of *T. vogelii* and *D. scandens* were capable of sedating the fish. *T. vogelii* could be identified as the most effective anesthetic agent at a dosage of 1.25 mL/L. *B. racemosa* can be categorized as a slow anesthetic agent as it exhibited longer induction and recovery time duration and it could be used when transporting fish.

Keywords: induction time, recovery time, anesthetic properties

*Corresponding author- email: thilini5344@gmail.com