

Effects of acetaminophen exposure on behaviour, erythrocyte nuclear morphology and gill histology of juvenile *Oreochromis niloticus*: an experimental study

Dissanayaka D.D.S.¹, Gunawickrama S.H.N.P.² and
Gunawickrama K.B.S.^{1*}

¹*Department of Zoology, Faculty of Science, University of Ruhuna, Matara, Sri Lanka*

²*Institute for Combinatorial Advanced Research and Education, General Sir John Kotelawala Defence University, Rathmalana, Sri Lanka*

Environmental presence of human pharmaceuticals remains a concern as it can cause adverse effects on non-target animals. Acetaminophen (APAP or Paracetamol), a common analgesic and antipyretic drug has been found in aquatic ecosystems. The present experimental study followed chronic effects of APAP on behavior, erythrocyte nuclear morphology and gill histology of juvenile tilapia *Oreochromis niloticus*. The experiment consisted of a triplicated control (no APAP) and two exposure groups containing 2 and 10 mg/L APAP in freshwater under static renewal procedure (n= 7x3). The effects were studied after 8-weeks of continuous exposure. Both APAP-exposed groups showed lower (p<0.05) food detection ability, physical avoidance response and mean ventilation rate compared to the fish in the control group, suggesting a possible neurotoxic effect of APAP. Exposed fish also had higher (p<0.05) occurrence of erythrocyte nuclear abnormalities (ENA) compared to those in the control group where the effects on 10 mg/L exposure group were more prominent. Histological alterations were also observed in gills of APAP exposed fish (n=4) showing dilation of secondary lamellae with associated blood congestion, and inter-lamellar hyperplasia. The results revealed that chronic exposure of juvenile tilapia to sub-lethal concentrations of acetaminophen in water caused altered behavior, ENA and pathological changes in gills. It is thus evident that APAP in aquatic environment could be hazardous to non-target animals like fish.

Keywords: Behavioural effects, ENA, environmental pharmaceuticals, genotoxicity, gill histopathology.

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*Corresponding Author: suneetha@zoo.ruh.ac.lk