

Behavioral Changes and Gill Histopathological Alterations of Red Hybrid Tilapia (*Oreochromis sp.*) Exposed to Glyphosate Herbicide

Authors : Abubakar Muhammad Umar, Nur Adeela Yasid, Hassan Mohd Daud, Mohd Yunus Abd Shukor

Abstract : Glyphosate [N-(phosphonomethyl) glycine] is among the most broadly and generally recognized broad-spectrum herbicides used in agriculture due to its low cost and effectiveness in weed management. The pollution of glyphosate in the aquatic environment can be via water run-off from agricultural lands, or by spray drift, aerial spraying or due to industrial discharge, which may be seen as a threat to aquatic biota. Fish is one of the best organisms to study the toxicological aspects of glyphosate. A 49 days experiment was conducted under laboratory condition to ascertain the effects of technical grade glyphosate on behaviour and histopathological conditions in the gills of red hybrid tilapia using light inverted microscope. Air gasping, erratic swimming, fin movement, mucus secretion, hemorrhages and loss of scales were observed as behavioural changes in the exposed fish. There was no any histopathological complication observed in the gill of the control fish, but various level of alterations were seen in the gills of the fish exposed to glyphosate herbicide. These include lifting of primary lamella, congestion of secondary lamella as well as hyperplasia in both primary and secondary gill lamella and hypertrophy of secondary gill lamella. Based on the findings of this study, glyphosate herbicide exerts behavioural and histopathological changes in the gill of red hybrid tilapia, and therefore the fish is considered as good bioindicator in aquatic environment monitoring. Excessive usage of glyphosate herbicide near aquatic habitats should be discouraged.

Keywords : glyphosate, behavioral, histopathological, tilapia

Conference Title : ICFA 2024 : International Conference on Fisheries and Aquaculture

Conference Location : Jeddah, Saudi Arabia

Conference Dates : November 11-12, 2024