



Hepatotoxic responses of 4-nonylphenol on African catfish (Clarias gariepinus): antioxidant and histochemical biomarkers

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Abstract:

4-Nonylphenol (NP) toxicity in fish attracts much attention due to its ability in targeting several organs; however, the researches regarding its potential hepatotoxicity are conflicting and still require further investigation. Therefore, the objective of this study is to focus on this issue from the histophysiological point of view using NP intoxicated African catfish (*Clarias gariepinus*) as a model of hepatotoxicity. Twelve adult fish (6 per group) were divided into two groups; the first was considered as a control and the second was exposed to NP dissolved in water at a dose of 0.1 mg/kg BW for 3 weeks. A significant reduction in the hepatic alanine aminotransferase, aspartate aminotransferase, and lactate dehydrogenase levels was observed in NP-exposed fish. Concerning the oxidant/antioxidant balance, a significant depletion in superoxide dismutase, catalase, and glutathione peroxidase was found along with a significant elevation in total peroxide and malondialdehyde. The histopathological examination of the hepatic tissues revealed that NP had marked hepatotoxic effects including hepatitis, centrilobular and focal hydropic and fatty degeneration, fatty change (steatosis), hepatic coagulative necrosis, and nuclear alterations in addition to apoptosis of hepatocytes and necrosis of endothelial cells. Depletion of the glycogen and increased in pigments (lipofuscin and hemosiderin) content in the hepatocytes were also recorded. Hemosiderosis and proliferation of the connective tissue around the blood vessels and branches of bile ducts and in the portal areas were also observed. In light of these findings, it was concluded that NP has a well-defined hepatotoxic impact paving the road towards other studies to investigate other detrimental cyto-physiological influences of this aquatic pollutant.

Keywords:

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