

## **Residual quantification and oxidative stress induced by malachite green after subacute and sublethal exposure in red tilapia**

### **ABSTRACT**

Background and Aim: Malachite green (MG) is an effective antiparasitic and antifungal chemical for treatment of fish. However, MG is reported to be a potential carcinogen. Yet, it is widely used in aquaculture despite its prohibition for use in food-producing animals by the EU and USFDA. The present study quantified MG residues and evaluated the oxidative stress in red tilapia when exposed to subacute and sublethal concentrations of MG. Materials and Methods: Red tilapia exposed to subacute (0.105 mg/L for 20 days) and sublethal (0.053 mg/L for 60 days) concentrations were evaluated for total plasma protein, total immunoglobulin, nitroblue tetrazolium activity, malondialdehyde, reduced glutathione (GSH), and catalase (CAT) activity levels. The residues of MG and leuco-MG (LMG) were also quantified in the fish muscles using liquid chromatography-tandem mass spectrometry. Results: Fish exposed to subacute concentration showed higher CAT on day 10 in the liver and days 5 and 15 in the spleen, whereas in fish exposed to the sublethal concentration, higher levels of GSH were observed on day 1 in the kidney and day 50 in the spleen. Fish muscle was able to accumulate the sum of MG and LMG of 108.04  $\mu\text{g}/\text{kg}$  for subacute (day 20) and 82.68  $\mu\text{g}/\text{kg}$  for sublethal (day 60). Conclusion: This study showed that red tilapia was able to adapt to the stress caused by exposure to MG at sublethal concentration.

**Keyword:** Malachite green; Oxidative stress; Red tilapia; Subacute; Sublethal