

Malachite green residues in farmed fish and the effect of some different cooking ways on it

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Abstract

This study was carried out to determine the residues of malachite green (MG) in *Tilapia nilotica* (N=40) and *Mugil cephalus* (N=40) fish muscle tissues by using Enzyme Immune Assay (EIA). Samples of farmed fish were obtained from Ismailia and Port- said markets. MG residues were detected in *Tilapia nilotica* in one sample (2.5%) above the permissible limits. Residues in six samples (15%) were under the permissible limits and were not detected in 33 samples (82.5%). In *Mugil* fish, MG was detected in two samples (5%) above permissible and detected in nine samples (22.5%) under permissible limits but was not detected at all in 29 samples (72.5%). The effects of various cooking methods (boiling, frying and microwaving) on residues of malachite green (MG) in *Tilapia nilotica* and *Mugil cephalus* were investigated. The MG residues in cooked fish were determined by EIA. The results showed that in muscles cooked by boiling, MG reduced by 50% in *Tilapia nilotica* after boiling for 15 minutes, while residues were reduced by 30% in the *Mugil*. Frying in deep oil reduced MG by 45% and 55% in *Tilapia nilotica* and *mugil cephalus*, respectively. Microwave reduced MG by 30% and 29% after two minutes, 40% and 35% after three minutes and 50% and 46% after 5 minutes in *Tilapia nilotica* and *Mugil cephalus*, respectively. The results in this study showed that the high temperature does not guarantee a full breakdown of residue of MG and leucomalachite green (LMG) which may occur in *Tilapia nilotica* and *Mugil cephalus* fish muscles. In conclusion, the overall results showed that MG residues exceeded the Egyptian maximum permissible limits in 2.5 - 5% of the contaminated samples analyzed from the two different locations (Ismailia and Port- said markets). Since this study is limited to farmed fish *Tilapia nilotica* and *mugil cephalus*, more investigations should be carried out to determine the residues of MG in other farmed fish species.

Keywords: Malachite Green – farm fishes – chemical residues – cooking by microwave – boiling – frying

Introduction

Aquaculture is currently the largest single source of fish supply in Egypt accounting for almost 65 percent of the total fish production of the country with over 99 percent produced from privately owned farms. As a result aquaculture is considered as the only viable option for reducing the gap between production and consumption of fish in Egypt. *Tilapia nilotica* has become the most important aquaculture species with a total harvest of about 390 280 tonnes, more