# Phenological and Liver Antioxidant Profiles of Adult Nile Tilapia (*Oreochromis niloticus*) Exposed to Toxic Live Cyanobacterium (*Microcystis aeruginosa* Kützing) Cells

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Blue-green algae (cyanobacteria) constitute the greater part of the phytoplankton. *Microcystis aeruginosa* is amongst the most ubiquitously distributed cyanobacterial species, and almost invariably produces cyclic heptapeptide toxins called microcystins (MCs). The present study was designed to investigate the phenological and liver antioxidant profiles of the Nile tilapia *Oreochromis niloticus* chronically exposed to toxic live *M. aeruginosa* cells. Fish were grown in the absence and presence of *M. aeruginosa* in three different concentrations for seven days, and subsequently reared for another 30 days in the absence of the cyanobacteria. While cyanobacteria did not cause any fish mortality, there was a progressive development of yellowish discolouration in the livers of exposed fish. In the livers, the activities and levels of superoxide dismutase (SOD), lactate dehydrogenase (LDH), glutathione (GSH), and lipid peroxidation products like malondialdehyde (MDA) were elevated in response to the concentration of *M. aeruginosa.* Moreover, DNA fragmentation and DNA-protein cross-links were measured. These parameters can thus be considered potential biomarkers for the fish exposure to *M. aeruginosa*. The present study sheds light on cyanobacterial blooms like health, environmental, and economic problem, respectively.

*Key words:* Cyanobacteria, *Oreochromis niloticus*, Oxidative Stress