



ACCUMULATION STATUS OF MICROCYSTIN- LR IN CULTURED AND NATURAL SAMPLES OF *Oreochromis niloticus* (NILE TILAPIA)

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Toxic cyanobacteria produce bio active compounds known as cyanotoxins. For example, toxin strain of *Microcystis aeruginosa* produce Microcystin in water bodies (MC-LR, -RR, -LW etc.) and these can accumulate along the food chain to higher trophic levels. Among Microcystin variants, MC-LR is the most hazardous. Serious health hazards were recorded due to accumulation of cyanotoxin, Microcystin (MC-LR) in fauna and flora; all over the world. Thus, in the present study, contamination status of MC-LR in freshwater edible fish species, *Oreochromis niloticus* was evaluated as many people in country side of Sri Lanka consume *O. niloticus* as a major protein source. The array of MC-LR accumulation was quantified using ELISA (Enzyme-Linked Immunosorbent Assay). In this study, laboratory MC-LR exposed *O. niloticus* and the same fish species samples collected during the month of March (2016) from Beira Lake was studied. MC-LR concentration of Beira Lake water when fish samples were collected was 2.57 ± 0.00 $\mu\text{g/ml}$ where laboratory exposed tank showed 1.25 ± 0.02 $\mu\text{g/ml}$. The highest MC- LR in fish skin of *O. niloticus* collected from Beira Lake was 1.657 ± 0.01 ng/kg where MC-LR in skin of cultured fish was 0.833 ± 0.02 ng/kg . The duration of exposure and the size of fish can be major reasons for detected results. MC-LR concentrations of liver, flesh and head of environmental samples were 6.60 ± 0.01 ng/kg , 0.114 ± 0.01 ng/kg and 0.314 ± 0.00 ng/kg respectively. High concentration of MC-LR (1.593 ± 0.01 ng/kg) in the laboratory cultured *O. niloticus* flesh was detected while a less amount of MC-LR was detected in head (0.018 ± 0.01 ng/kg). The recorded values were beyond the given WHO TDI value; $0.04 \mu\text{g/kg}$ bw/day . It was found that MC-LR concentration in flesh even after the boiling at 100°C was remained same in un-boiled fish flesh, revealing that temperature had no effect on removing MC-LR. The highest mean Bio Accumulation Factor was recorded as 0.241 ± 0.01 for skin whereas, the lowest recorded as 0.050 ± 0.00 in flesh of environmental samples. Therefore, the risk assessed and the accumulation status shows that it is better off without the consumption of 'skin' of MC-LR contaminated fish species in order to avoid the bio accumulation of MC-LR.

Keywords: *Microcystis aeruginosa*, *Oreochromis niloticus*, Bio accumulation, ELISA, Bio accumulation factor