

Biochemical and Molecular Genetics Biomarkers as Indicators of Fish Pollution in Egypt

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ABSTRACT

The present study was undertaken to evaluate the effect of some aquatic pollutants such as commercial formulation of glyphosate-based herbicide (Roundup®), cadmium chloride as a heavy metal and mixture between them in freshwater Nile tilapia (*Oreochromis niloticus* L.) fingerlings by some biochemical, molecular and cytogenetic markers as bio-indicator of fish pollution in Egypt. This study was conducted at “Central Laboratory for Aquaculture Research”, Abbassa, Abo-Hammad, Sharkia, Agriculture Research Center through three experiments in three exposure periods with different concentrations after calculating LC₅₀.

This study focused on biochemical variations through determination the activity of some antioxidative parameters such as SOD, CAT, GST, GSH and MDA as biochemical biomarkers of fish pollution through taking samples from important exposure tissues as gills and liver after each exposure period. In addition, lysozyme activity of plasma as cellular immune biomarker was estimated. Determination Physicochemical parameters of water as Temperature, dissolved oxygen, salinity, electrical conductivity, total dissolved solids, hydrogen ion concentration (pH), total alkalinity, total hardness, total ammonia, nitrite-nitrogen, dissolved orthophosphate, heavy metal in water and heavy metal in fish samples.

This study mainly concentrated on the biochemical and genetic variations for nuclei of DNA of the gills and liver cells after exposure for these pollutants by estimation of DNA damage by single cell gel electrophoresis (SCGE) or comet assay after each exposure period and subsequently, study the gene expression at blood plasma protein level by SDS-PAGE protein electrophoresis as molecular genetic markers after each exposure period.

Key words:

Nile tilapia fish, Pollution, Biochemical, Molecular Genetics, Biomarkers, Cadmium Chloride, Glyphosate, Cytotoxicity, SDS-Protein, Antioxidants, DNA comet assay.

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