

# TOXICOLOGY AND APPLIED PHARMACOLOGY

July 20-22, 2017 | Chicago, USA

## Biochemical and enzymatic changes induced by Butachlor during sublethal exposures in freshwater fish *Labeo rohita* (Hamilton)

K Prasuna<sup>1</sup>, K Somaiah<sup>2</sup> and K Sunita<sup>2</sup><sup>1</sup>Kakatiya University, India<sup>2</sup>Acharya Nagarjuna University, India

**Statement of the Problem:** The need for higher production of food makes us to use pesticides for disease control in both plants and animals. Pesticides usage will harm to the non-target organisms also in the ecosystem. Fish species are very sensitive to various chemicals and will have deleterious effects on the growth and reproduction. The present study was conducted to investigate the effect of acute toxicity of Butachlor, an herbicide, on biochemical alterations and enzymatic inhibition of Indian major carp, *Labeo rohita*.

**Methodology & Theoretical Orientation:** The median lethal concentration (LC<sub>50</sub>) value of the toxicant was estimated by using Finney's Probit Analysis. The biochemical and enzymatic parameters were estimated spectrophotometrically using standard methods. The LC<sub>50</sub> of Butachlor was found to be 0.85 mg/l for 96 hours. Fish were exposed to sublethal doses for 1 day and 10 days to evaluate the biochemical alterations and enzymatic inhibition.

**Findings:** During sublethal exposures, a significant decrease in glycogen, protein, lipid, carbohydrate and free amino acid (FAA) content was observed. An increase in the level of lactate dehydrogenase (LDH) activity was noticed and a significant decrease in levels of succinate dehydrogenase (SDH) and malate dehydrogenase (MDH) activity were observed in pesticide exposed tissues of gill, liver, kidney, muscle, intestine and brain when compared with the control tissues. The biochemical alterations might be due to the disruption of internal organs. Increase in enzyme activity may be due to the damage caused to the lysosomal membrane, thus permitting the leakage of lysosomal enzyme into cytosol.

**Conclusion & Significance:** Decrease in enzyme activity infers to energy metabolism of the nervous system, arrest the transmission of nerve impulses and thereby causing behavioral changes. Thus the above parameters could be effectively used as potential biomarkers of the pesticide toxicity to the fishes.

### Biography

K Prasuna has completed her BSc and MS from Kakatiya University, India. Presently, she is pursuing her PhD at the same university. She has worked as an Associate Pathologist in Clinical Laboratory at Saudi Arabia for about 15 years. Her research interests include environmental toxicology, study of medicinal plants and isolation of bio active compounds for drug development. Currently, she is working on extraction of medicinal plants for isolation and characterization of bioactive compounds to test for anti-venom properties especially for testing the inhibitory activity of toxic proteins

prasunagangu@gmail.com

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