

Toxic Effect of Detergent Ariel on Lipid Contents of freshwater Catfish 'Macrones Cavasius'

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Abstract:-

The toxicity of detergent a household cleaning agent was investigated on lipid contents of freshwater Cat fish 'Macrones Cavasius' Indiscriminate use of soap and detergents (Ariel) cause toxic effect on aquatic organism. Impact of short term exposure of sublethal concentration of detergents Ariel on lipid content of Macrones cavasius was studied in the Laboratory condition Biochemical changes occur in exposed fish that the detergent (Ariel) is harmful to the fish.

Keywords:- Toxicity, Detergent Ariel, 'Macrones cavasius', biochemical composition.

Introduction:-

Detergents contains traces of iron, manganese & zinc. Detergents are organic compounds which have existed at phase boundaries, where they are of three types anionic, cationic and non ionic detergents. When they discharged in the water they may change PH, total alkalinity, free CO₂, Dissolved oxygen and also effect the rate of photosynthesis and lead to eutrophication (Najam et.al., 2010). Detergents are also capable of destroying the external mucus layers of fish and in addition to this cause disruption of endocrine functions. (Barber et.al., 2007)., Linear alkyl benzene sulphonates (Henko) exposed fish *puntius ticto* shows severe damage in gills lamellae (pande et.al., 2011) and liver is also damaged in *puntius ticto* expressed to detergents (Jain et.al., 2013). Lipid being the energy source that act as a spare during chronic period of stress, detergent molecule can penetrate and reduce the permeability of cell membrane by solubilizing lipid content.

Fishes are widely used to evaluate the health of aquatic ecosystem; and physiological changes serves as biomarkers of environmental pollution. The effect of external stressors and toxic substances on exposed fish could be made manifest through clinical diagnosis of fish physiology, hence the need for this study.

Materials and Methods:-

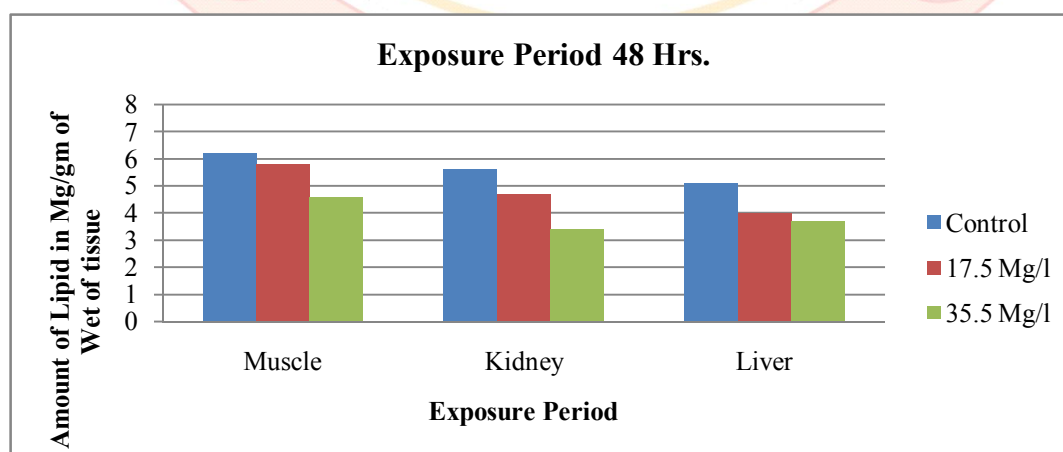
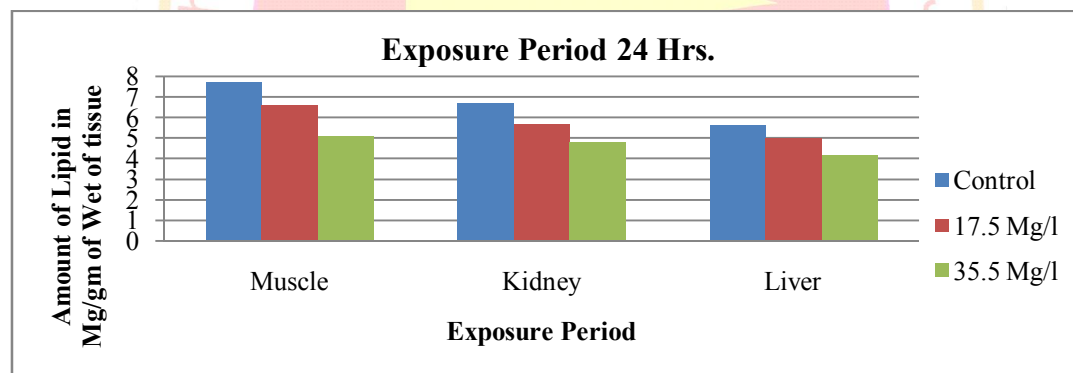
The live freshwater 'Macrones Cavasius' of average length 15-20 cm and weight 150-200 gm were purchased from Pimpri dam water, Tq. Udgir. The fish were disinfected with 0.1% potassium permanganate as described by Joshi et.al., 2002 and acclimatized for 8 days in the Laboratory in an aquarium. Mortalities were recorded and dead fish were removed from aquarium by using aquarium net. A fish was considered dead when they failed to respond to simple prodding with a glass rod, Presence of mucus on the skin and gills of test fish was also checked by feeling with the fingers. Fish were fed with dry prawn powder daily; before experiment fish were starve for 24 hours. The tanks were aerated throughout the acclimation period. The present study was undertaken to know the toxic effect to Ariel on lipid content of 'Macrones Cavasius' because scientific data on this effect is measure.

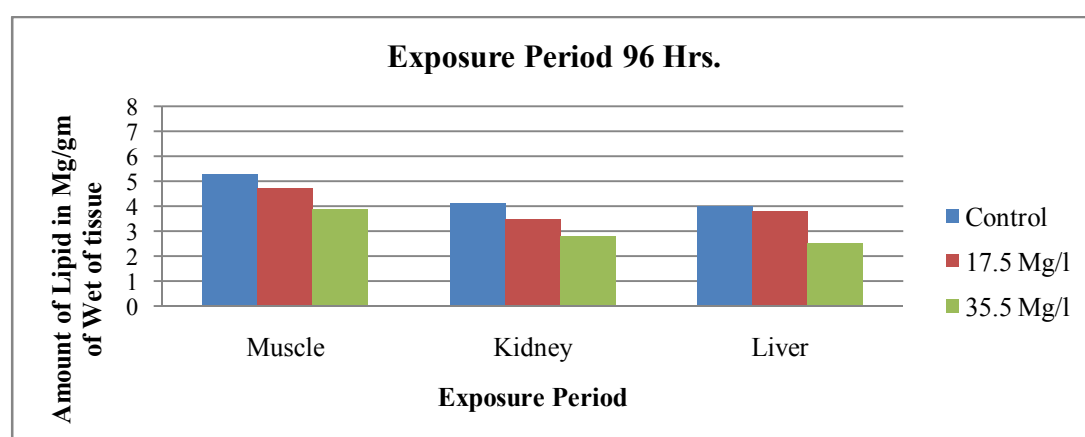
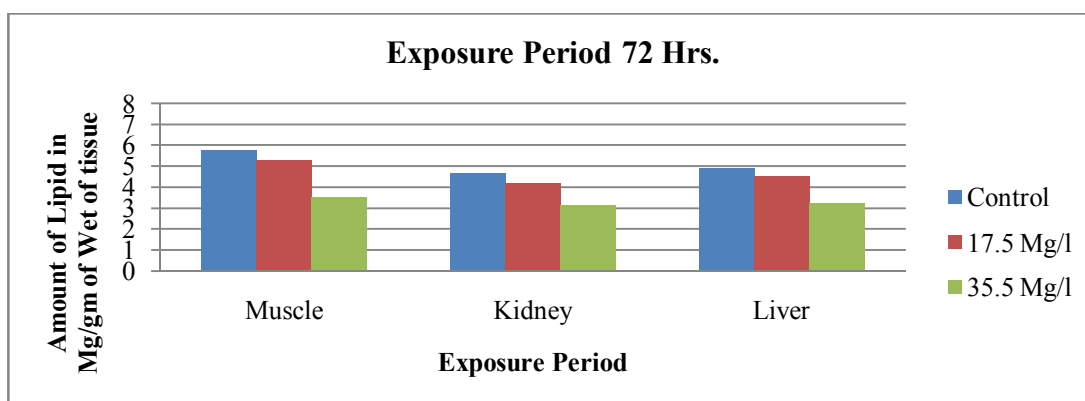
Quality parameters such as temperature, dissolved oxygen and PH of the experimental setup were monitored using standard methods. APHA 1998. Lethal concentration (LC₅₀) value was estimated as per the (Litchfield and Wilcoxon et.al., 1949) 75 mg/h. *Macrones cavasius* were exposed to two sets of sublethal concentrations (17.5 mg/l, 32.5 mg/l, control) of Ariel for 96 hours period

excluding control. In each set 6 fishes is exposed. Test solutions and water in the control were renewed daily. Response of animal was recorded. Fishes were sacrificed after each interval of 24 Hrs to tissue collect from muscles, Kidney and Liver for estimation of lipid content. Lipid is estimated by method chloroform-methanol method (Raymont et.al., 1964).

Table: Shows the effect of sublethal concentration of detergent Ariel on lipid content (Mg/gm) in tissues of freshwater Catfish 'Macrones Cavasius'

Sr. No.	Exposure period (Hr)	Studied tissue	Control	Sublethal Concentration	
				17.5 mg/l	35.5 mg/l
1	24	Muscles	7.70±0.763	6.58±0.870	5.12±0.780
		Kidney	6.71±0.455	5.68±0.978	4.80±0.980
		Liver	5.60±0.890	5.00±1.025	4.18±1.027
2	48	Muscles	6.20±0.726	5.80±1.200	4.60±0.84
		Kidney	5.63±1.061	4.72±0.856	3.40±1.05
		Liver	5.11±0.855	4.00±0.552	3.70±1.162
3	72	Muscles	5.80±0.654	5.30±0.980	3.52±1.15
		Kidney	4.70±0.794	4.20±1.109	3.15±0.986
		Liver	4.90±1.168	4.52±0.867	3.22±1.013
4	96	Muscles	5.30±0.850	4.70±0.965	3.90±0.954
		Kidney	4.11±0.965	3.50±0.852	2.80±1.048
		Liver	4.00±0.744	3.82±0.897	2.50±1.035





Results and Discussion:-

The lipid content in three different tissues (Muscles, Liver and Kidney) of *Macrones cavasius* was indicated in table. The present study showed significant decrease in lipid content in the studied tissues of '*Macrones Cavasius*', lipid content is higher in muscles than liver and kidney. It declined may be due to utilization of fats for energy demand under the stress condition. Debashish Roy (1988) investigated that there is decrease in various lipid moieties of epithelial cells, goblet mucus cells and club cells. Under the influence of detergent treatment Tejinder Kaur and Saxena (2002) also shows the lipid content was decreased in *Cirrhina mrigala* they suggested that the total lipid content might decrease due to inhibition in process of lipid biosynthesis or greater utilization of stored lipid to meet the increased demand of energy in pollution stress. The present study revealed the toxic effect of detergent Ariel on the biochemical composition of different tissues like muscles, kidney and liver of the selected fish '*Macrones Cavisius*'. It found that biochemical changes occurs in exposed fish that the detergent Ariel is harmful to the '*Fish Macrones Cavasius*'.

Conclusion:-

This study has been able to establish the fact that Ariel detergent is toxic and that exposure of the *Macrones cavasius* can induce various toxicological effects. In view of the toxic effects of detergents, it can be inferred that indiscriminate discharge can be detrimental to Aquatic fauna.

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