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RESEARCH PAPER

Toxicological effect of fluoride on the growth of fingerlings with special reference to *Channa marulicus*

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ABSTRACT

Study was carried out to investigate the impact of fluoride on growth of fingerlings of freshwater fish, *Channa marulicus*. They were made to expose to different sublethal doses of fluoride (30 mg/l of water and 60 mg/l of water) for three months. Age watching control was maintained for the period of experiment. Observation revealed that fluoride concentration as well as exposure had an impact on the growth of fishes.

Key words : Fluoride growth, Sublethal, *Channa marulicus*.

Out of all the chemical elements in periodic table, fluoride is the most electronegative and very much reacting element. Existence of this element is either as inorganic fluoride or organic fluoride compound. As far as the UNEP is concerned, it has included the fluoride in the list of environmental pollutants. Natural weathering of rocks is the main source of fluoride in environment. As report says the level of fluoride has gone upto experimental level in environment and because harmful in water, food, air and forage on many parts of the globe.

Concentration of fluoride in atmosphere due to various man made activities like industries which include iron steel manufacturing plants, aluminium sweeters, phosphate fertilizer units, coal power producing units etc. Recent reports indicate that from different parts of India, the level of fluoride has increased upto 41 ppm in freshwater where as in unpolluted freshwater the fluoride concentration ranges from 0.01 to 0.33 mg/l. Higher level of fluoride in water causes various physiological problems in animal as well as human beings. Despite the fact that fluoride has been considered as a serious pollutant and there is significant increase in the concentration in ecosystems, little is known about the toxicity of fluoride in aquatic animals.

Workers have complained the impairment of reproduction and retarded growth in industrial workers and in mice. On the ground of above mentioned facts, in the recent completed study, it has been thought to observe the impact of fluoride concentration on the growth of fingerlings of which is a fresh water fish definitely being exposed to higher level of natural fluoride concentration in fresh water bodies regularly.

MATERIALS AND METHODS

Study was conducted in fingerlings of *Channa marulicus* collected from the aquatic body of Saran, identified as an aquatic research point. The aquatic body was K/a Bahiara wetland having the large catchment area and dominant vegetation.

For performing experiment, fingerlings (weighing 7.0 ± 0.25 gm/7.0 ± 0.21 cm length) were divided in three groups, each group having 12 fingerlings. Group I served as control while group II and III served as experimental group. Group II was exposed to lower concentration *i.e.* 30 mg F/l of water while group III was exposed to higher concentration *i.e.* 60 mg F/l of water. Source of fluoride was Naf (Sodium fluoride).

Experiment was conducted for three months. During this very period, morphological growth and weight were recorded every month for all three groups. Comparison was made between the control and experimental groups to observe the impact of fluoride on growth.

RESULTS AND DISCUSSIONS

After being exposed to fluoride, it was observed that the increase in weight and length of fingerlings was noticed.

Length:

As far as the control group is concerned, there was increase in length of fingerlings at each level of observation *i.e.* regular increase was found after the end of one month. Experimental group indicated that there was slight increase in length of fingerlings exposed to lower concentration after two months where as in fingerlings exposed to higher concentration, there was no enlargement at all (Table 1).