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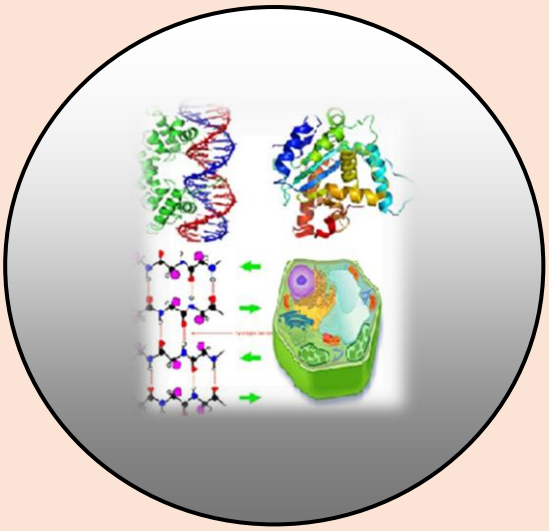

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RESEARCH PAPER

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Determination of Bio Concentration Factor of Chromium on *Cyclops viridis* and *Diaptomus forbesi*

***Abdul Bari Khan, Kumari Sukshma, Praveen Priyadarshi,**
Ram Pravesh Rai and Dhyanendra Kumar
***Dr. Z.H.I.I. College Nidhauli Kalan Etah, U.P., 207122, India**
Department of Zoology, Veer Kunwar Singh University, Ara, Bihar, 802301, India

ABSTRACT

Planktons play very important role in the entire ecosystem. Toxic action on planktons may have chronic effect on food chain. This idea was well supported by Kaviraj et al. (1985). Significant biological production is carried out by plankton in many water bodies, such as oceans, lakes, streams, and swamps. As planktons are deeply susceptible to natural change, they are the strongest indicators of water quality and lake conditions in particular. In almost all forms of bodies of water, pesticides are major contaminants. The toxicity of Chromium, petroleum products, detergents, heavy metals and many types of pesticides to protect marine life, which is depicted, was documented (Battish, S.K. 1992, Konar and Mullick 1993). The experiments were also conducted to evaluate the dose and duration dependent response of planktons. The extent of Bio-concentration Factor (BCF) depends on the absolute rates of uptake and elimination of the compound by the organism. Bio-concentration factor of chromium is determined by dividing the concentration of chromium in water.

Keywords: Plankton, Zooplankton, Cylops viridis and Diaptomus forbesi, Pollutants Pesticide and Chromium.

INTRODUCTION

Toxic action on planktons may have chronic effect on food chain. This idea was well supported by Kaviraj et al. (1985). They observed that increased mortality of fish due to toxicity might have due to the induced toxic action through planktons. Planktons play very important role in the entire ecosystem. Many human activities cause the environment to be contaminated, environmental factors to be altered, and therefore changes in the aquatic communities (Mihaljevic, et al. 1998).

Water contaminants may derive from point sources or non-point sources. Point sources of contamination, such as industrial discharges, spillage and municipal sewage treatment plants, are those that can be detected at one location (Awah, 2008, Anyinkeng, N. et al. 2016).

Pollution is one of the main specific threats to biodiversity. The impact of human activities on the physical and biological environmental are a major part of the "human dimensions of global change". Human activities are changing the biophysical world locally, regionally and globally.

In the study of eco-toxicological issues in the past, ecology has taken a secondary role. It has been used in large part to provide meaning to basic toxicology studies or to support Interpretation of knowledge obtained in the field, where environmental insights have been introduced. Eco-toxicity tests of chemicals. He observed that if a species can apparently tolerate the abiotic condition at that place (Zannatul Ferdous et al. 2012) pleaded not only to measure biological and abiotic factors at the same time and place but also to compile them in a databases and to make use of them to find generally applicable principles (Paul et.al. 1977, Sarkar, S.K. 1981, Sharma, B.K. 1983).

Environmental health is also an important instrument for detecting environmental changes, whether positive or negative, and their resulting impact on human society. The existence of bio indicators in the environment, such as the transmission of light, water, temperature and suspended solids, is controlled by certain factors. The natural state of a certain area or the level/degree of pollution can be predicted by applying bio-indicators (Khatri and Tyagi 2015, Trishala et.al. 2016).

Environmental health is also an important instrument for detecting environmental changes, whether positive or negative, and their resulting impact on human society. The existence of bio-indicators in the environment, such as the transmission of light, water, temperature and suspended solids, is controlled by certain factors.

Planktons are used to determine environmental health and are also a significant method for identifying both positive or negative environmental changes and their resulting impact on human society. There are a variety of factors that control the presence of bio indicators in the environment, such as the transmission of light, water, temperature, and suspended solids. The natural state of a certain area or the level/degree of pollution can be predicted by applying bio-indicators (Khatri and Tyagi, 2015).

Variations in animal populations can indicate harmful changes caused to the environment by pollution. Changes in population density can have detrimental effects on the environment. Population changes can result from the relationship between populations and food sources; if food resources become scarce and are unable to reduce the population demand for those populations will follow (Plafkin et al. 1989, Phillips and Rainbow 1993, Jain et al. 2010).

The present paper deals with the determination of bio-concentration factor of chromium on *Cyclops viridis* and *Diaptomus forbesi*.

MATERIAL AND METHODS

Glass tank size 35.5 x 15 x 10cm containing 6-liter filter water. The substance forms a hook in bottom of container at the centre of each tank room temperature, under light and dark photo period condition. The substance obtaining from sample location after 14 days of colonization as the source. Each tank was randomly chosen for sampling as follows- 3, 7, 14, 21, 28 and 35 days of collection. Estimated pH, temperature, hardness, Chromium, phosphate, nitrate and alkalinity. The 4% formalin fixed for sample collection of plankton for further analysis (APHA-1992, Pratt JR-1990, Sokal RR-1981, Kumari and Abdul et. al. 2017).

The extent of Bio-concentration factor (BCF) depends on the absolute rates of uptake and elimination of the compound by the organism. Chemical pollutants may concentrate from water into aquatic organisms. The extent of bio concentration is expressed as the Bio-concentration factor (Kc), which is chemical concentration in organism (Cf) divided by the concentration in water (Cw) i.e. BCF = Cf /Cw. Here an attempt has been made to calculate the Bio-concentration factor (BCF).

RESULTS AND DISCUSSION

Phytoplanktons and Zooplanktons are primary and secondary producers. A study made by Kaviraj et al. (1985) is indicated mortality of plankton due to toxicity (Table 1).

Table 1. Effect of Chromium on *Cyclops viridis* and *Diaptomus forbesi* Zooplankton LC_{50}.

Organism	mg of maltose liberated mg of protein		
	Control	Treated	Inhibition
Cyclops viridis	1.6	0.15	32.1
Diaptomus forbesi	1.8	0.13	31.6

From the above table it is clear that there were 32.1 and 31.6 percent of inhibition in α-amylase e activity, it is however, cannot be suggested that how much amount of pollutant is accumulated in the organism to provide the observed percentage of inhibition. An attempt was, therefore, made to determine the accumulated concentration of pollutants needed or such inhibition by orienting an experimental pattern where pollutant was added in varied from the above table it is clear concentration in the different incubation medium maintaining other factors constant. Results of this observation are depicted in figure 1 and 2, where decrease in the liberation of maltose per mg. of protein is expressed as percent toss in enzyme activity. Thus, by noting the percent of inhibition the accumulated concentration of Chromium could be determined from the abscissa of figure 1 and 2.
The said proportion of inhibition as in table 1 of α - amylase activity seems to be due to the accumulation of about 200 µ gm of pollutants as could be calculated extrapolating the data from fig. 1 and 2.

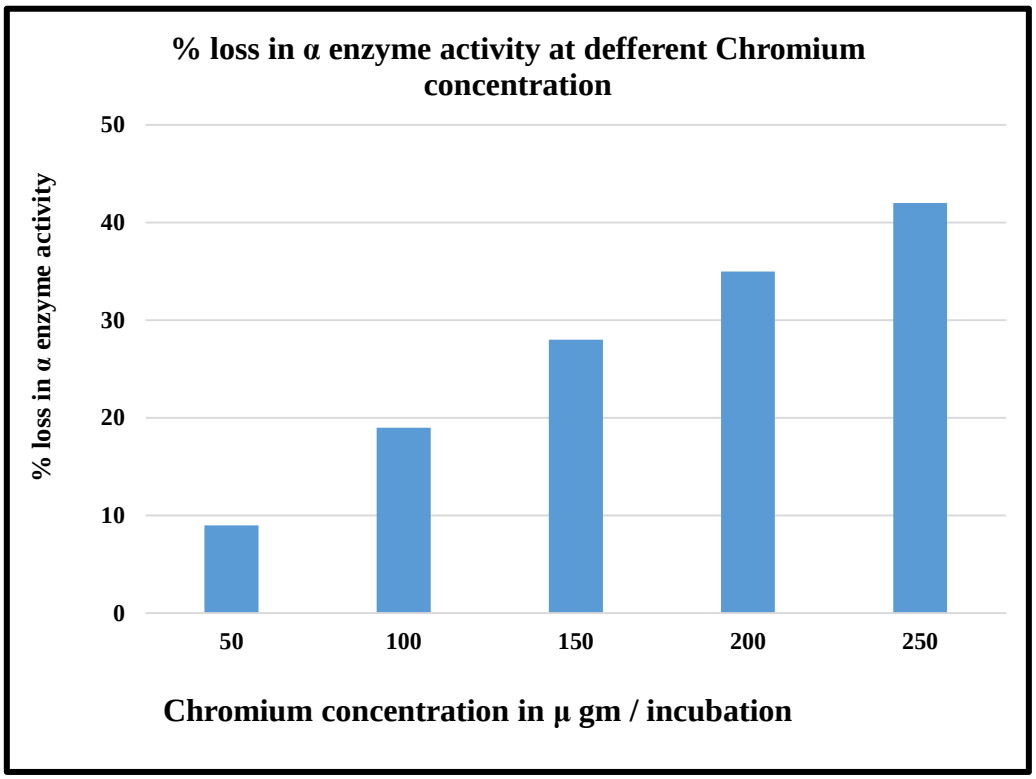

Figure 1. Effect of in vitro addition of Chromium on a-amylase activity. Incubation medium and assay of the enzyme were same.

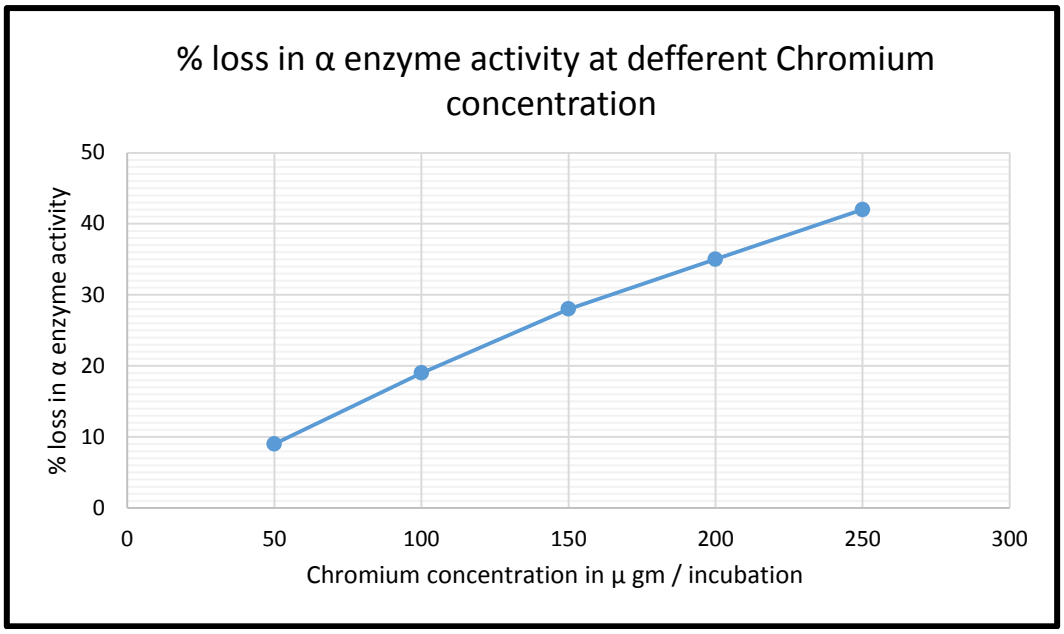

Figure 2. Effect of in vitro addition of Chromium on α - amylase activity. Incubation medium and assay of the enzyme were same.

CONCLUSION

Under the stress condition when productive capacity of Phytoplankton decrease then the said organism increase its respiratory rate, for struggle for survival.

At the extreme stage, when there is a maximum stress, both the productivity and consumption become nullified, perhaps this is due to cellular disintegration, disruption and distortion of the organism in the environment and toxic effect.

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Corresponding author: Abdul Bari Khan, Dr. Z.H.I.I. College Nidhauli Kalan Etah U.P. – 207122 (India)
Email: abdulbari52@gmail.com