

Concentration of Heavy Metals (Copper and Lead) in *Channa punctatus* and *Wallago attu* with Special Reference to Upper Lake of Bhopal

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ABSTRACT

The aim of present investigation is to assess the concentration of heavy metals (Pollutants) copper and lead in fish samples of (*Channa punctatus* and *Wallago attu*) by Atomic Absorption Spectrophotometer (AAS). The lower Concentration of copper and lead is determined about 2.0 mg/kg and 0.2 mg/kg in *Channa punctatus* respectively and The lower Concentration of copper and lead is determined about 2.2 mg/kg and 0.4 mg/kg in *Wallago attu* respectively from the site of khano gaon, this site not contain any agriculture waste. The higher concentration of copper is about 3.5mg/kg and lead is determined 1.4mg/kg in *Channa punctatus*, and in *Wallago attu* copper is about 3.5mg/kg and lead is present 1.5mg/kg respectively the site of Beta Gaon these two sites belong to Upper Lake of Bhopal.

Author determined the Upper Lake of Bhopal. The lower and higher concentration of copper and lead in *Channa punctatus* and *Wallago attu*. The high load of pollutant in Beta Gaon site which is received rural and agriculture waste it is main caused of pollution this area used by fisher man for the catching of fishes.

Key words: Copper and lead, concentration, freshwater fish, ecosystem, consumers.

INTRODUCTION

Water pollution is the contamination of streams, lakes, underground water & oceans by substances harmful to living thing. Water is necessary to life on earth. All organisms contain it some live in it, some drink it. Plants and animals require water that moderately pure, and they cannot survive if their water is loaded with toxic chemicals or harmful microorganisms. If severe water pollution can kill large numbers of fish, birds, and other animals, in some cases killing all members of a species in an affected area. Pollution makes streams, lakes, and coastal waters unpleasant to look at, to smell, and to swim in. Fish harvested from polluted waters maybe unsafe to eat. People who ingest polluted water can become ill, and with

prolonged exposure, may develop cancers or bear children with birth defects.

The Pollution of aquatic ecosystem by heavy metals is an important environmental problem. The substances causing pollution are called pollutants. Copper is about 2 ppb is fatal to fishes and Zinc, Nickel and lead about 1 ppm concentration is lethal for fishes. Heavy metals constitute some of the most hazardous substances than can bioaccumulate. Fishes is an important and acceptable food by consumers for its nutritive value fishes are often the top most consumers in aquatic ecosystem.

Bhopal, the capital of M.P. is known as City of Lakes. The Upper Lake is located between

latitude 23° 12'-23° 16'N and longitude 77° 18'-77° 23'E. it is a shallow tropical Lake. Upper Lake is surrounded by residential areas, green parks, boating club and agriculture areas.

The Lake is also rich in bio - diversity Upper Lake received waste materials from the surrounding areas. Water body gets contaminated with a variety of pollutants generated from diverse sources (agricultural and domestic). Among the pollutants, pesticides, heavy metals and detergents are the major cause of concern for aquatic environment becomes of their toxicity, persistency and tendency to accumulate in organism.

Sampling Sites

There are Three Sites

Rethghat

This site is situated near Kamla park surrounded by running area, temple and masjid area, this site received the waste materials of temple and masjid. fisherman used this site to catching the fishes.



Rethghat

Khano Gaon

This site surrounded by residential area and can not be contain any industrial effluent, this site contain only residential waste, and fisherman used to catching the fishes.



Khano Gaon

BetaGaon

The ending part of Upper Lake call to Beta Goa, it is large rural area. This site use by formers for the agriculture purpose, fisherman also used this site for catching the fishes, it received the waste material of rural area, agriculture waste (pesticides etc) from this site, collect the fishes which contain higher concentration.



Beta Gaon

Pollutants including heavy metals and pesticides peoples consume these fishes as food.

cold digest. Then further digestion using the laboratories standard methods for hot nitric acid digestion.

METHOD

Fishes were collected from above three sites in November monthly by dip-nets and lift nets, identify the species of fishes (*Channa punctatus* and *Wallago attu*). Than rinsed the fish with water for removal of any external sediment, and collect in ice-bath their temperature 4°C is controlled.

After the completion of digestion the samples were filtered into acid washed volumetric flasks and diluted to 50ml for metal analysis. For determined the concentration of copper and lead using flame atomic absorption spectrophotometers in part per million.

Heavy metal analysis

Fishes were collected from above three sites, than rinsed, the *Channa punctatus* in water for removal of any external sediment, and take in ice-bath there temperature 4°C is controlled. Then, remove the alimentary canal and record the body weight of *Channa punctatus* and *Wallago attu*. The frozen fishes were thawed and classed in particulars size smaller (18mm-26mm) average (26mm-34mm) and larger (34.2-40.1mm) in size then sample (*Channa punctatus* and *Wallago attu*) was placed by glass petridish on oven for 24 hours at 60°C. Once the fishes were dry, then whole fishes ground into a similar powder. Approximately 0.8 grams of powder for each sample take acid washed beaker and add 7.5 ml of Nitric acid and left 12 hours on a

RESULTS AND DISCUSSION

According to the above investigation the lowest concentration of Copper is 2.0 mg/kg and lead is 0.2 in *Channa punctatus* and 2.2 mg/kg and 0.4 mg/kg in *Wallago attu* respectively at the site of Khano Gaon VIP road Bhopal. This site is surrounded by residential areas, and can not be contain any industrial effluent, these area received the temple and mazid waste materials etc.

The highest concentration of copper 3.5 mg/kg and lead is 1.4 record in *Channa punctatus* and 3.5 mg/kg and 1.5 mg/kg in *Wallago attu* respectively at the site of Beta Gaon Bairagh, Bhopal. This site is surrounded by rural areas and agriculture land. This site is used by farmers, animal

Table 1: Show the concentration of copper and lead in *Channa punctatus* at different sites

S. No.	Species	Sampling Station	Concentration		Analysis by AAS
			Copper	Lead	
1.	<i>Channa punctatus</i>	Rethghat	3.0 mg/kg	0.5 mg/kg	-"
2.	<i>Channa punctatus</i>	KhanoGaon	2.0 mg/kg	0.2 mg/kg	-"
3.	<i>Channa punctatus</i>	BetaGaon	3.5 mg/kg	1.4 mg/kg	-"

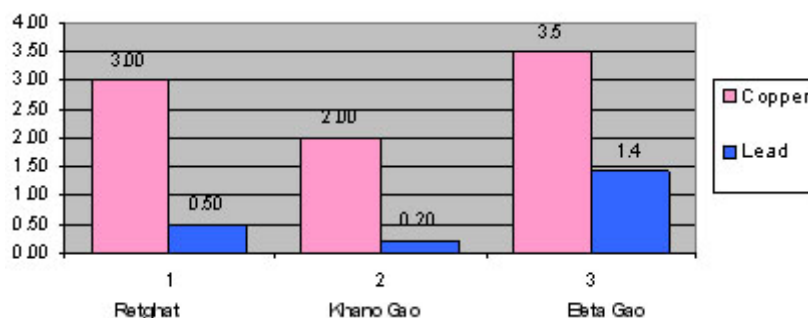
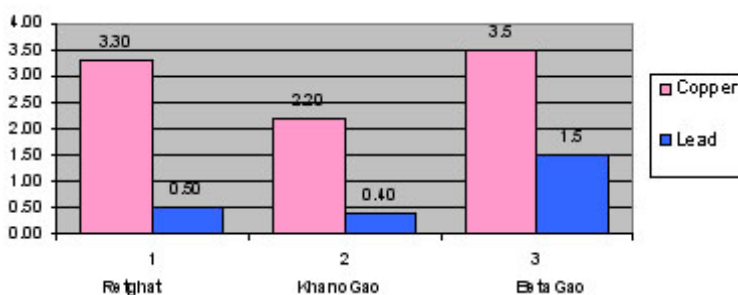


Chart 1: *Channa punctatus*

Table 2: Show the concentration of copper and lead in *Wallago attu* at different sites

S. No.	Species	Sampling Station	Concentration		Analysis by AAS
			Copper	Lead	
1.	<i>Wallago attu</i>	Rethghat	3.3 mg/kg	0.5 mg/kg	-"
2.	<i>Wallago attu</i>	KhanoGaon	2.2 mg/kg	0.4 mg/kg	-"
3.	<i>Wallago attu</i>	BetaGaon	3.5 mg/kg	1.5 mg/kg	-"

**Chart 2: Wallago attu**

activities and fisher man. From these site fresher man catch or collect the fishes, which contain higher concentration of pollutants including heavy metals and pesticides, and people consumes these fishes as food.

CONCLUSIONS

Author determined the concentration of copper and lead is found in fish sample (*Channa punctatus* and *Wallago attu*) it is prove that the activities of animals and human beings which are the main cause of pollution and these pollutants (heavy metals) copper and lead not only effect to fishes as well as effect to consumers.

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