



HEAVY METAL ANALYSIS FROM LABEO ROHITA AND CATLA CATLA BY USING ATOMIC ABSORPTION SPECTROSCOPY.

Zoology

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ABSTRACT

Heavy metals occur during natural process and also obtained antropogenitic activities. heavy metals contaminated in water by industrial influence, agricultural influence and due to domestic sewage. In present study level of heavy metals namely chromium, cadmium, arsenic, lead, zinc, nickel, mercury and copper are found in aquatic environment in two different species in fish (Catla catla and Labeo rohita). The increasing level of heavy metals in water bodies are incorporate in fish through the food chain. Impact of heavy metals in the aquatic environment, its effect in fish and also effect in human health. Harmful effect of heavy metals in fish which include several poisonous effect in blood such as anemia, acute inflammation in the liver and several other. The conclusion the toxic effect of heavy metals in two different species in fish (Catla catla and Labeo rohita) and the effect of bioaccumulation and biomagnification have been review.

KEYWORDS

Heavy metals, fish, accumulation, water bodies.

INTRODUCTION:-

River and pond water ecosystem is essential for survival of human life because river and lake are the source of water for all purpose. Aquatic ecosystem is very vulnerable to all kind of pollution most of the water bodies are polluted due to different pollutants such as sewage water, industrial effluent human activities are also responsible for water bodies pollution. water quality deterioration and accumulation of toxic chemical, shrinkage of surface are where resulted (Nagaprapura and shshikanth 2002).

Both marine and fresh water fish are consumed regularly in the region of Amravati, which is a matter of concern considering the industrial and urban growth. Fish is a important source of high quality protein. Fish are widely consumed due to high protein content and low saturated fat and sufficient omega fatty acid known to support good health (USEPA 2004), now a day increasing in human population, industrial and other antropogenitic activities have been increase the heavy metals contamination in water which directly disturbed aquatic environment. The sewage water contains substance like Chromium, Cobalt, Iron, Nickel, Zinc etc. this elements are found in higher concentration that are harmful for linving organism. Heavy metals are incorporated in water bodies by activities from use of.

Agricultural Effluent Pesticides

Pesticides are the chemicals and substance which used to kill or control pest and disease in plants. The increase in pesticide concentration and deposition in the environment causing pollution is obtain by rapid industrialization, urbanization, economic growth, development of agriculture practice, increase antropogenitic activities (shrama et al.2019)

Fertilizers

Lakes, rivers, streams surrounded by farmland in use of heavy metals enriched fertilizers have positive correlation to the increase in heavy metals in from the use of chemical, organic and water soluble fertilizer for long period.(wei 2020).

It is reported that source water from along farms from the application manure. chemical fertilizer, organic fertilizer, compound fertilizer and water soluble fertilizer reveal the ability and accumulation of heavy metals to be significantly influenced by AP,TN, and IN, which are associated with fertilizer application this posing health risk to biodiversity in habitat (Li et al,2019, wei et al 2020).

Industrial Effluent

In addition to agriculture effluence water bodies is constantly being contaminated by the continue discharge of sewage and industrial effluence into the water bodies. The industries are making use of various heavy metals such as Iron, Steel, Copper, Nickel, Platinum, and lead. The major source of contamination of surface and ground water is discharge of manufacturing effluence without treatment inside

the water bodies.

Domestic Sewage

Procced water from cosmetic industries, detergent industries, textile industries often high level of heavy metals. The release of such waste into surrounding water bodies cause distruprtion of the ecological balance of organism.

Material And Methods Area Of Study

Water sample as well as edible fish (Catla catla, Labeo rohita) sample is collected from in and around water bodies from Amravati region. pH and temperature is recorded according to APHA Guideline. Water sample is prepared by digestion for heavy metal analysis the concentration of Cd, Co, Cr, Cu, Fe, Ni, Pd, Zn and Mn is determine by using atomic absorption spectrophotometer.

Fish Sample Collection

Fish (Catla catla, Labeo rohita) sample is collected from selected water bodies with the help of local fisher man and will bring into the laboratory for tissue collection.

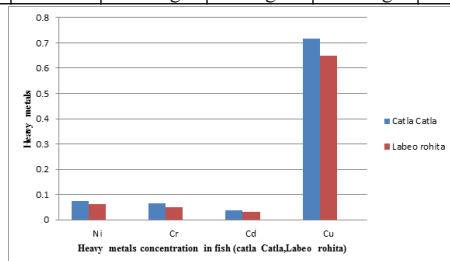
Sample Preparation For Analysis

The collected fish (Catla catla, Labeo rohita) samples is transported to polythene bags and will taken to the laboratory at low temperature. Fish samples will weight and total muscles, kidneys, liver and gills is remove and wash with 10% nitric acid. After blending homogenized tissues is kept in a dry oven in two to three days at 60°C. Dry tissues sample is powdered using porcelain mortar and pestle after that sample is digested by using nitric acid. Dry sample is ready. During the process of atomic absorption spectrophotometer take the powder sample 5 gm add 5 ml of HNO₃ and 5 ml of H₂SO₄ then the sample place in oven at 60°C for 30 minutes after 30 minuts sample is come out from oven then sample is cool down for same time after that and 10 ml HNO₃ and heat the sample again at 120°C then the sample turn black coloured again cool the sample and add 10 ml H₂O₂ the vigorous reaction may occur then repeated adding H₂O₂ till sample are clear then add 50 ml deionized water, sample is ready for atomic absorption spectrophotometer.

RESULT AND DISCUSSION

Fish Species Name		Concentration of heavy metal in different body parts (ppm wet weight)			
		Ni	Cr	Cd	Cu
Catla catla	Gland	0.066 mg/L	0.054 mg/L	0.027 mg/L	0.421 mg/L
	Intestine	0.077 mg/L	0.068 mg/L	0.044mg/L	0.768mg/L
	Liver	0.083mg/L	0.066mg/L	0.034mg/L	0.835mg/L
	Stomach	0.060mg/L	0.060mg/L	0.046mg/L	0.601mg/L
	Gills	0.085mg/L	0.073mg/L	0.048mg/L	0.962mg/L
	Mean	0.074mg/L	0.064mg/L	0.039mg/L	0.717mg/L
Labio	Gland	0.056mg/L	0.043mg/L	0.028mg/L	0.312mg/L

rohita	Intestine	0.068mg/L	0.057mg/L	0.023mg/L	0.784mg/L
	Liver	0.071mg/L	0.044mg/L	0.021mg/L	0.735mg/L
	Stomach	0.040mg/L	0.043mg/L	0.038mg/L	0.489mg/L
	Gills	0.078mg/L	0.063mg/L	0.041mg/L	0.923mg/L
	Mean	0.062mg/L	0.05mg/L	0.030mg/L	0.648mg/L



The difference in the levels of accumulation in different organs of a fish can primarily be attributed to the difference in the physiological role of each organ. Other factor such as regulatory ability, behavior and feeding habits may play a significant role in the accumulation difference in the different organs (marzouk, 1994) also the chemical nature of the metals ionic strength and pH tends to be a master variable in the accumulation process.

The mean concentration of heavy metals in the Gland, Intestine, Liver, Stomach, Gills of selected fish sample are given in table 1. The lower concentration of Ni, Cr, Cu, Cd, were usually recorded in gland rather than the other organs while the higher values were recorded in the gills for all samples.

Waste water discharge from sewage and industries are major component of water pollution in Amravati region.

CONCLUSION

This study showed that heavy metal concentration in various tissue of fish (Catla catla, Labeo rohita) sample while the level of Cr, Cu, Ni and Cd are within the standard limit set by joint FAO/WHO (2015) the concentration of Cd exceeds the limit. Heavy metal level in the fish at present is dangerous and long term consumption of the fish from the area may pose a serious health risk to regular fish consumers. To harvest fish and fish production that are safe for human consumption, there should be continuous monitoring of heavy metals level in water bodies to prevent accumulation of heavy metal in water bodies and in fish. Various human activities such as the location of automobile workshop, dumping of domestic sewage and other activities that are harmful to the safe use of the water bodies in Amravati region should be reduced. Appropriate measures such as legislative provision and other tools for effective environmental monitoring should be adopted and used to protect and enhance the quality of the river.

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