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BIO MONITORING OF HEAVY METALS ACCUMULATION IN SOME EDIBLE FISH FROM WATER BODIES OF AMRAVATI REGION (M.S.)

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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. Heavy metals include chromium, cadmium, arsenic, lead, zinc, nickel, mercury and copper are found in aquatic environment. The increasing leval 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 fish and the effect of bioaccumulation and biomagnification have been review.

KEYWORDS : Heavy metals, fish, contamination, 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 antropogenetic 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 distruption of the ecological balance of organism.

Material And Methods Area Of Study

Water sample as well as edible fish 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 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 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

Seq.No.1	Sample Id:S1						
Elem Ni	Sample Cone	Pk Area	BG Area	Pk Ht	BG Ht	Time	Joint WHO/FAO
	0.066 mg/L	2.9463		0.3593		11:21:33	0.5
	0.068 mg/L	2.9354		0.3524		11:21:42	
	0.065 mg/L	2.9534		0.3564		11:21:56	
Mean	0.066 mg/L						
Seq.No.2	Sample Id: S2						
Elem Cr	Sample Cone	Pk Area	BG Area	Pk Ht	BG Ht	Time	
	0.254 mg/L	2.7163		0.3193		11:45:59	1.00
	0.056 mg/L	2.7154		0.3124		11:46:08	
	0.059 mg/L	2.7134		0.3164		11:46:16	
Mean	0.056 mg/L						
Seq.No.3	Sample Id:S3						
Elem Cd	Sample Cone	Pk Area	BG Area	Pk Ht	BG Ht	Time	
	0.024 mg/L	2.3793		0.3193		12:38:51	0.20
	0.026 mg/L	2.3724		0.3124		12:39:01	
	0.033 mg/L	2.3764		0.3164		12:39:09	
Mean	0.027 mg/L						
Seq.No.4	Sample Id:S4						
Elem Cu	Sample Cone	Pk Area	BG Area	Pk Ht	BG Ht	Time	
	0.956 mg/L	2.3793		0.3193		02:16:30	0.29
	0.963 mg/L	2.3724		0.3124		02:16:38	
	0.966 mg/L	2.3764		0.3164		02:16:47	
Mean	0.962 mg/L						

Data in table 1 shows the level of heavy metal concentration in different fish sample from water bodies of Amravati region. The study quantifies heavy metal concentration in the gland, intestine, liver, stomach and gills of different species of fish in different water bodies of Amravati region. Heavy metal concentration in fish tissue the finding of this study showed thatthe mean concentration of heavy metals in the fish tissues differs significantly amongst the sampled fish species in water bodies of Amravati region. Heavy metal level in the different species of fish include Nickel, Cromium, Cadmium, Copper.

The fish tissue (liver, intestine, gland, stomach, gills) recorded difference in the rate of heavy metal concentration. The study also establish that heavy metal accumulation were higher in the gills followed by gland, intestine, stomach and liver. The present study quantifies the disparity in heavy metal accumulation in species-species. The quantity of heavy metal disparity as measured in gill, liver, stomach, gland and intestine are shown in figure 2 and 3. These findings further revealed that the heavy metal concentration in aquatic environment may influence cultured fish more than wild fish, probably because the water used in aquaculture does not flow and may be contaminated either through industrial effluents or possible infiltration. There by increasing the changes of heavy metal bioaccumulation in the fish tissue. In addition the feeds and chemicals use in culturing the fish may contai heavy metal.

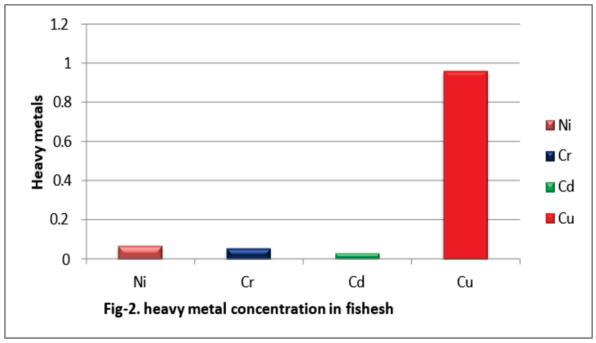

Fig-2. heavy metal concentration in fishesh

CONCLUSION

This study showed that heavy metal concentration in various tissue of fish 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 ascend and used to protect and enhance the quality of the river.

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