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HEAVY METAL POLLUTION OF DAM AND RESERVOIR WATER

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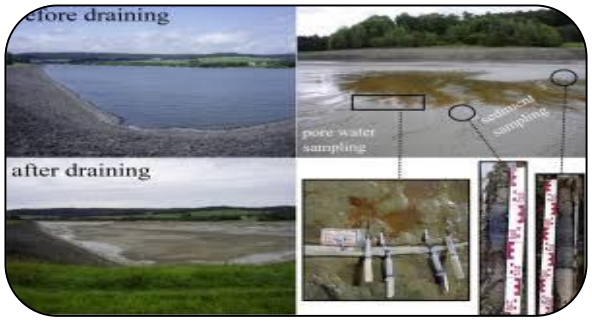
ABSTRACT :

Industrial sewage, domestic sewage, agricultural effluent the flow of metals into the river flows .The flawless tendency has led to large contamination of water and soil with heavy metals, thereby posing a danger to plants and animals and aquatic ecosystems. Therefore, biological monitoring studies are needed to evaluate the toxic concentrations of various chemical compounds so that some preventive measures can be taken to ensure the safety of the environment. Therefore, this study was focusing on investigating the important heavy metals such as zinc, chromium, cadmium, mercury and lead. It was found that mercury was highest in both waters (16.34 - 19.28 /g / L) followed by lead (13.35 - 17.27 µg / L), cadmium (1.72 - 2.32 µg / L), chromium (0.76 - 3.83 µg / L) and Zinc at the end (0.73 - 1.59 .g / L). Lead warrants are studied especially for high concentrations of mercury and their remedy so that the concentration remains safe for those who depend on water

KEYWORDS : *Heavy Metal, Water, Pollution*

INTRODUCTION:

Heavy Heavy metals such as Hg, Cu, Cd, Zn, Ni etc. are commonly present in trace concentrations in the Earth's crust. These metals in the trace are essential for the normal metabolism of living organisms because they facilitate physiological function and also form part of the structural component. However, industrial processes and anthropogenic activities such as the use of metals, mixtures of metals and metal compounds can lead to environmental contamination. Due to the excretion of such metals in the aquatic environment and the drainage of mine residues, the content of these metals has increased manifold in aquatic media such as waterways, lakes, rivers and dams. According to an ATSDR survey report, about 60% of the water available in India was found to be heavily contaminated with heavy metals and other chemicals. Pollution of heavy metals in freshwater animals assumes an important importance because they are stable compounds and therefore are not easily disposed of by oxidation, precipitation, etc., and have adverse effects on animal action. Heavy metals have a unique property in life because of their low concentration in lakes, rivers and dams. Due to the high concentration of metal in natural water, aquatic organisms can have various harmful effects. Substantial concentration has an equally serious impact on aquatic biota, which results in changes in growth, reproduction, creativity and other biological phenomena.



Higher filtration in dams and reservoirs adversely affects aquatic organisms by changing their biochemical status, habitat, food sources and respiratory gradients. It has been found that obstructing the flow of water generally through dams

and reservoirs has adversely affected all major river systems in the world. Sludge is a serious problem, especially in India's densely populated areas. With the rapid and blind pace of urbanization and industrialization, the increasing burden of chemical contaminants in soil has increased. The major classes of organic contaminants in aquatic and terrestrial ecosystems are polycyclic aromatic hydrocarbons. These compounds affect microbes and are potentially dangerous to human health due to their genotoxic, mutagenic and or cancer potential

METAL CONTENT IN WATER:

1. Zinc: Zinc is an essential component of the human body. In addition to zinc industrial waste, galvanized Fay and brass de-zincification deteriorates into domestic supply. Studies show that zinc levels in the rainy season range from 1.26 to 1.38 µg/L. The zinc content in water during the winter season is between 0.79 and 0.81 µg/L for the study period. In summer, the density of zinc in the dam and reservoir water varies from 1.59 - 1.67 µg/L. In both current studies, zinc content was reported to be higher in summer and lower in winter, with water levels in the dam significantly lower; therefore, heavy metal concentration is likely to increase. They reported the seasonal variations of zinc content in the climate water, in summer and in rainy season, at least in winter.
2. Chromium: Chromium levels are 3.97- 4.00 µg/L in the rainy season. During winter, its concentration ranged from 1.76 - 1.78 µg/L. Chromium levels in the water decrease from 0.68 to 2.03 µg / L in the summer. In the present study, chromium concentrations were highest in both monsoons and in monsoons, but in 2015-16, summer and winter were less.
3. Cadmium: The cadmium levels in the water during the monsoon season are between 1.76 to 1.85g / L. Cadmium levels in winter are between 2.15 and 2.21µg/L in the monsoon. In the summer, cadmium content was recorded in the range of 1.82 – 1.91 µg / L. It is clear that cadmium levels are high in monsoon and low in summer.
4. Lead: The lead in the water was higher in the rainy season and the concentration was 17.79 .g / L. In winter, the lead content in both years was 15.15 µg/L. In the summer, however, the concentration of metal in the water was lower between 13.89 - 13.24 µg/L than in the other two seasons.
5. Mercury: During the monsoon season the water content is between 14.87 and 14.91 µg/L. In winter, the amount of mercury in water is high and it is between 17.17 and 17.28 µg/L. However, the highest level of mercury in the water during summer was between 17.94-18.01 µg/L. Thus, mercury levels were higher in summer and less in monsoon. The result of the concentration of metal in the water of the dam shows that in summer, zinc and mercury were high whereas chromium, cadmium and lead were highest in the monsoon.

METAL CONTENT IN SEDIMENTS:

Sewers are the main source for assessing anthropogenic contamination in aquatic environments. It is important to note that contamination of the sludge can have serious consequences on the entire ecosystem. Evaluating the concentration of heavy metals in aqueous systems helps to better understand the processes in this system. It facilitates the planning and implementation of environmental management plans. It is also important to note that a strong relationship exists between water and sludge, as water characteristics have a significant influence on silt.

1. Zinc: During the monsoon, the content of zinc in the sludge is between 0.58 and 0.61 µg/g. In winter, it is between 0.55 and 0.58 µg/g. In summer, the content of zinc in the sludge is between 1.49 - 1.52 µg/g. Therefore, zinc content was recorded highest in the summer and lowest in winter compared to the other two seasons.
2. Chromium: During the monsoon, the average chromium content in the sludge is between 10.25 and 10.28 µg/g. In winter, the chromium content in the sludge is between 6.28 - 6.33 µg/g. In summer, its range was between 9.57 and 9.60 µg/g Chromium content was reported to have higher in the mud

during the monsoon whereas lower content was recorded in winter. The excess chromium content in the sludge was attributed to industrial waste, household wastes, and farm dung in nearby villages.

3. Cadmium: The cadmium content in the sludge during the monsoon was between 4.17 and 4.21 .g / g. In winter, cadmium content in the sludge was recorded in the range 4.21 - 4.24 .g / g. The cadmium content in the sludge during summer is between 1.37 to 1.48 48g / g. Therefore, cadmium levels in the basin were found to be higher in the monsoon and lower in the summer.
4. Lead: When the lead content was observed in the sludge during the monsoon, the volume in the sludge was between 23.77 and 23.51 .g / g. In winter, lead content of silt is between 15.59 - 15.62 .g / g. During the summer season, lead content is between 18.65 and 18.58 .g / g. Lead content in the mud was recorded highest in the monsoon and lowest in winter.
5. Mercury: During the monsoon, the mercury content in the mud ranges from 11.16 - 11.28 .g / g. In winter, the content of mercury is between 10.26 to 10.40 / g / g. However, the highest levels of mercury in the summer were between 12.95 and 13.02 / g / g. The mercury levels in the basin were highest in the summer and lower in the other two seasons.

DISCUSSION:

In aquatic environments, metals are referred to as conservative pollutants because once added to the atmosphere, they last longer without being removed by the process of oxidation, precipitation, etc. Therefore, the main cause of heavy metal contamination is freshwater environment. Anxiety, because reducing the environmentally sensitive species or destroying commercial species and posing a threat to natural health. An increase in the concentration of heavy metals in water results in histological, biochemical, morphological and physiological changes as well as behavioural changes. In aquatic water bodies such as dams and lakes, bivalves usually act as bio-monitors organisms in areas suspected of contamination. Monitoring of metals, such as Zn, Cr, Cd, Pb and Hg, which are toxic to water and organisms, requires the evaluation of water and sediment metals to draw some basic information.

Sources of zinc are metallurgy and galvanic industries, mines, incinerators and anti-corrosive products, which provide water sources by releasing waste and wastewater. In the present study, the zinc levels in the water sample are between 1.49 - 1.52 µg/g. Low levels were recorded in winter and high levels were recorded in summer. Zinc content was high in the summer. The range of zinc content in the sludge is between 0.58 and 0.61 µg/g. The trend is similar to water the zinc content is lower in winter and higher in summer. Due to the fact that the volume of water in the dam is high in the summer, heavy metal concentration in the water and sewage may be high, so it may be due to increased concentration of heavy metals with anthropogenic inputs or due to agriculture. According to the study, zinc content was analysed in Kailana Balsam and Ranisar ponds near Jodhpur and observed high metal content ranging from 70 to 250 µg/g. This trend was similar for zinc content in water and sludge, but less in heavy metal than in water.

During the study it was observed that the average chromium content in the sludge is between 10.25 and 10.28 µg/g. In winter, 6.28 - 6.33 µg/g. and in summer, its range was between 9.57 and 9.60 µg/g and during the monsoon period it is at 10.25 and 10.28 µg/g also in summer period it is 9.57 and 9.60 µg/g.

The cadmium levels in the water during the monsoon season are between 1.76 to 1.85g / in winter are between 2.15 and 2.21µg/L in the monsoon. In the summer, cadmium content was recorded in the range of 1.82 – 1.91 µg / L.

CONCLUSION:

Contamination of heavy metals is a major concern for aquatic environments, as it can result in the destruction of environmentally sensitive species or the destruction of commercial species and poses a serious threat to human health. In order to inspect the metals that are toxic to aquatic life and concentrate in the food chains that threaten the human life below, it is important to evaluate the metals in the water and sewage to draw some basic information. Therefore, the present study aimed to investigate the

concentration of some heavy metals such as zinc, chromium, cadmium, mercury and lead in water with sludge in the dam and reservoir. The dam on the Godavari River is the lifeblood.

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