



## **Studies on Heavy Metals in Gastropods: Base Levels of Zn, Cd and Hg in Foot of Estuarine Snail *Telescopium Telescopium* (Linne.)**

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### **ABSTRACT**

The term heavy metal refers to any metallic element that has a relatively high and toxic or poisonous at low concentration. Heavy metals occur in aquatic system from natural sources and anthropogenic sources. Most of heavy metals are constituents of aquatic environment and some of them are biologically essential. The present paper is concerned with accumulation of the heavy metals Zinc (Zn), Cadmium (Cd) and Mercury (Hg) in the foot of estuarine snail *Telescopium telescopium*. These metals were analyzed by atomic absorption spectrophotometer (AAS) in the freshly collected snails from the Bhatye estuary in Ratnagiri city (Maharashtra). The concentration of Zn  $0.043 \pm 0.0022 \mu\text{g/gm}$  and  $0.004 \pm 0.001 \mu\text{g/gm}$  respectively in the foot. The concentration of Hg was not at detectable level in the foot. At a comparative level the concentration of zinc was more than cadmium in this organ the difference in the base level of Zn, Cd and absence of Mercury in the foot have been discussed in relation to toxic effects of these heavy metals on the metabolism efficiency of the foot in this snail.

**Keywords:** Heavy metals, Gastropods, Spectrophotometer, *Telescopium telescopium* etc.

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### **INTRODUCTION:-**

Heavy metals are classified according to their toxicity as non toxic, low toxic and high toxic [1]. Problems of heavy metal pollution is global problem. Our entire environment that is air, water and soil is polluted with large quantities of various heavy metals. Heavy metals are persistent and remain in the biota for a long period. Increased population and rapid economic and industrial development can cause many ecological problems to marine environment [2-6].

They showed that mollusc accumulate Cadmium and elements toxic to man. Gastropods are common inhabitants of Mangrove ecosystem and suitable organisms for maintaining environmental contamination and metal bioavailability studies [7-13]. The physical factors also influence the physiological activity of organism through their effect on metabolic rates [14].

Heavy metals are natural components of the earth's crust. They cannot be degraded or destroyed. To a small extent they enter our bodies via food, drinking water and air as trace elements. Some heavy metals example copper, selenium and zinc are essential to maintain the metabolism of the human body. However, at high concentration they can lead to poisoning. Some metals are biological essential but some are toxic heavy metals Zn, Cd and Hg in foot of estuarine snail *Telescopium Telescopium* (Linne) collected from the laboratory reared controlled group and from their natural environment inhibiting experimental group.

### **MATERIAL AND METHODS-**

Estuarine gastropod snail *Telescopium Telescopium* were collected from Bhatye estuary in Ratnagiri (Maharashtra). They were brought to the laboratory the organ foot where quickly incised and cleaned initially. They were kept at 60° in oven upto complete dryness of the tissue. The dried tissue were kept in muffle furnace at 550° for about 8 to 12 hrs. until the tissue were converted to ashes. The 100mg ash was accurately weighted on one pan balance (k-Roy classic) and dissolved the ash in 20 ml HCL. After cooling the solution at room temperature, they were filtered through Whatmann's filter paper No. 42. The filtrates were diluted up to 100 ml by using distilled water. The diluted solution was analysed for Zn, Cd and Hg using atomic absorption spectrophotometer (model AANALYST, Perkin Elmer U.S.A).

## RESULT AND DISCUSSION

Heavy metals are serious contaminants of aquatic system due to their extended biological half life inherent toxic nature at low concentration and high rate of bioaccumulation [15]. Heavy metals are most common environment at pollutants. Their occurrence in water and biota indicate the presence of natural or anthropogenic sources associated with industrial and domestic effluents [16 and 17]. They can easily be accumulated by primary consumer (algae) and biomagnified through their transmission across the higher level of the food chain causing a direct effect on human health[18].

**Table No. 1: concentration of heavy metals Zn, Cd and Hg in foot of control and experimental *Telescopium telescopium*.**

Concentration of Heavy metals in $\mu\text{g/gm}$	Tissues of Control animals	Tissues of Experimental animals
Zn	0.026 $\pm$ 0.007	0.043 $\pm$ 0.002
Cd	ND	0.004 $\pm$ 0.001
Hg	ND	ND

ND: Not detected

Metal metabolism in mollusc is influenced by physiological factors including age, growth and reproductive condition [19]. The surrounding media dependent heavy metal concentration in mantle has been observed in many other invertebrate animals [20 and 21].

The concentration of Zn was more in experimental animals and low in control animals. The concentration of Hg was not at detectable level in foot at a comparative level the concentration of Zn was more than Cd in this organ. The heavy metals may circulate through the different trophic levels of food chain. The gastropods are found only in these places where the heavy metal contamination is up to certain limit.

The reasons of variation in concentration of heavy metals and nutrients in various tissues of gastropod species under study have been correlated with concentration of heavy metals in the surrounding environment and in the foot of these gastropods. A need of gastropods as bioindicators of heavy metals and their possible use in biomonitoring is also suggested from this work. The concentration of heavy metals in the water the accumulation of these heavy metals in the tissue of gastropod species is discussed in relation to metabolic activities and their adverse effects on growth.

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