

Effect of Heavy Metals on Rainbow Trout Causing Potential Risk to Consumers

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Review Article

Received: 20/11/2016

Revised: 26/11/2016

Accepted: 29/11/2016

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Keywords: Rainbow Trout; Heavy metals; Fishes; Mitochondria; Consumers

ABSTRACT

The aim of the review is to describe about the effect of the different heavy metals which are disposed in the aquatic environment, causes an impact on the aquatic organisms and also on human Kind. The effect of metals on the rainbow trout mitochondria and the tissues and organs levels were observed. Thus consuming the fishes could bring the potential risk on the health of the consumers.

INTRODUCTION

Rainbow trout (*Oncorhynchus mykiss*) is a fresh water species of salmonid natives found in pacific oceans in Asia and North America, some migrate from great lakes to tributaries to spawn like steelhead (*O.m. irideus*) or to oceans to like Columbian river, redband trout (*O.m. gairdneri*).

The adult rainbow trout differ in size and weight according to the habitat. They range from 0.5 to 2.3 Kg in riverine environment and may reach to 9 Kg in anadromous forms [1-5]. The fresh water trout are blue green or olive green with black spotting on the body, whereas anadromous and lake dwelling are silvery with reddish stripes. Regarding the lifecycle they eat larval, pupal, adult insects and anything they capture. They spawn in northern hemisphere for the month of January to June and September to November in southern hemisphere. The maximum life span is 11 years [6-11].

Heavy metals accumulation in fishes

The accumulation of heavy metals due to industrial wastage, disposed in the water directly effects the tissues and organs of the fishes leading to loss of and disturbance of natural environment [12-17]. According to sarikiya et al. determined the effect of zinc and copper accumulation of different medium concentration [18-27]. The increase in concentration of copper and zinc decrease the survival rate of rainbow trout and most the copper had toxic effect than zinc on it. The other conditions like temperature, pH, hardness, also effected the growth and development of trout [28-33].

The effect of cadmium, copper and zinc for two species *ceriodaphnia dubia* and rainbow trout in soft water and hard water was determined by Naddy R B, Cohen A S, Stubblefield W A. This helped in understanding metal toxicity in aquatic organisms [34-36]. The consumption of the trout containing in heavy metals like lead and cadmium and polychlorinated bi phenyls can be risky was explained [37-50]. The decreasing resistance of with concentrations of metals in fish size was observed [51-54]. The effect of nickel causes histopathological damage in brain of fish [55-62]. The exposure of warm acclimation, hypoxirai Oxygenation and copper in rainbow trout led to the dysfunction of mitochondrial transport system was observed [63-67]. The mitochondria dysfunction due to copper (Cu) in fish increased by global climate changes [68-71]. The concentration and accumulation of molybdenum in the aquatic organism and aquatic eco-system can increase potential risk of the human kind [72-78]. The effect of silver

nanoparticles like accumulation of AgNPs in the fish gills and liver was found to be more [79-85]. The exposure to the copper, oxidative stress brought cell death in hepatocytes of the trout [86-100].

CONCLUSION

Thus, the review is to bring out the harmful effect on aquatic organism due to improper usage of wastage and direct disposal of the heavy metals in the aquatic ecosystem which is indirectly bringing the potential risk to the consumer. The accumulation of the heavy metals in the rainbow trout has been observed and the damaged caused to it was briefed or noticed. This review gives an overview of situations, identifying the conditions and redirecting to more indepth studies on this research.

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