

Heavy Metal Pollution: Copper

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Editorial

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Editorial

One of the biggest problems of the world is environmental pollution due to development of technology and increase of population. Heavy metal pollution is one of element of pollution. Heavy metals are released to environment (water and soil) because of industrial, agricultural and mining activities. For example copper sulfate has been used for fungal disease control in viticulture in Portugal and in aquaculture in Turkey. Copper is discovered in the aquatic habitats collecting runoff water from this agricultural area [1]. Copper is also found in some areas contaminated by domestic wastes such as mining, smithery, waste incinerators, thermal reactors generating power from coal and construction materials used for buildings [2]. Heavy metals accumulate in the aquatic organisms. Especially, it is found that they accumulate in different amount and different tissues of fish. There are many literatures about it [3-6]. Heavy metals enter the food chain in aquatic ecosystems and it increases in it. Then they could be dangerous to human, which is the top of the food chain [7].

Copper is the essential trace metal for all organisms in nature. Since it acts an important role in the fish metabolism such as cellular respiration, free radical defense, neurotransmitter function, and connective tissue biosyntheses. It is also used into structural protein [1]. This heavy metal causes toxicological effects on fish if its concentration is high in the water. Actually, physiological detoxification mechanism works, but if the copper concentration is higher than detoxification capacity, there is nothing to do.

A toxic concentration of copper causes histopathological disorders in fish. For example, copper exposure induces edema, lifting of epithelium cells,

intense vasodilation in lamella, additionally lamellar fusion due to proliferation in epithelia and aneurisms in gills and vacuolization and necrosis in liver of tilapia (*Oreochromis niloticus*) [1]. Copper toxicity provokes also necrosis, hypertrophy, and rupture of gill epithelium and hemorrhage in lamellar cells in 7 day exposure and lifting of epithelium cells, edema, and fusion in 28 day exposure. Decrease in size of liver cells, vacuolization, hypertrophy in liver; fusion of microvillus, change in mucus membrane, cell swelling in intestine; edema, largening of cells in muscle of Asian sea bass (*Lates calcarifer*) [8].

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