Minimize of Cadmium by Medicinal Plants (Review)

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Abstract: Contamination of aquatic ecosystem by industrial and agricultural pollutants may affect the health of fish, either directly by uptake from the water, or indirectly through their diet of vegetation, invertebrates or smaller fish. While the obvious signs of group pollution, dead fish, has long been recognized, there is increasing evidence that low-level pollution may decrease the fecundity of fish population, leading too long term decline in fish numbers, such sub-lethal pollution could impact on reproduction either indirectly via accumulation in the reproductive organs, or directly on the free gametes (sperm or ovum) which are released in to water. Owing to their bioaccumulation and non-degradability, heavy metals pose a serious pollution hazard to the aqueous environment. Fish exposed to metals are usually characterized by increased metal levels in the gonads. Gonadal levels of copper and zinc of *Catostomuscommersoni* living in polluted lakes were higher than those in fish inhabiting unpolluted waters. More concentration on an example of heavy metal widely contaminating our Egyptian water bodies.
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Introduction:

Cadmium is a major contaminant originating from different industrial wastes and phosphate containing fertilizers. Cadmium is a ubiquitous environmental pollutant that has been associated with severe damage in various organs, particularly the testes, causing severe testicular degeneration, seminiferous tubule damage and necrosis. Pituitary damage, testicular degeneration and decrease in fry numbers inhibition of spermatogenesis with only a few spermatids and mature sperms remaining after cadmium exposure have already been reported. Disruptive effects of pollutants could be due to disruption of the endocrine system and the inhibition of hormone production, the deleterious effects of toxicants may be exerted on the hypothalamic-pituitary system or could be directed at gonadal steroid production. Plasma estrogen decreased after exposure of *Monopterusalbus*to cadmium, although it has been shown that cadmium contamination stimulates vitellogenesis, plasma levels and in-vitro synthesis of estradiol in Atlantic croaker.

Considering the high sensitivity of the testicular tissue to Cadmium toxicity, prevention and/or therapeutic intervention is of major concern. The use of herbal medicine has become increasingly popular worldwide. A lot of herbal materials were widely used as a folk remedy for curing male infertility in traditional medicine. Upon our available data, the present study is considered a preliminary trial concerning the anti-infertility effect of some herbal remedies against Cadmium induced male infertility.

Contamination of aquatic ecosystem by industrial and agricultural pollutants may affect the health of fish, either directly by uptake from the water, or indirectly through their diet of vegetation, invertebrates or smaller fish.

While the obvious signs of group pollution, dead fish has long been recognized, there is increasing evidence that low-level pollution may decrease the fecundity of fish populations, leading to long term decline in fish numbers, such sub-lethal pollution could impact on reproduction, either indirectly via accumulation in the reproductive organs, or directly on the free gametes (sperm or ovum) which are released in to water [(1)]. Owing to their bioaccumulation and non-degradability, heavy metals pose a serious pollution hazard to the aqueous environment. Fish exposed to metals are usually characterized by increased metal levels in the gonads. Gonadal levels of copper and zinc of *Catostomuscommersoni* living in polluted lakes were higher than those in fish inhabiting unpolluted waters [(2)]. More concentration on an example of heavy metal widely contaminating our Egyptian water bodies; Cadmium is a major contaminant originating from different industrial wastes and phosphate containing fertilizers. Cadmium is a ubiquitous environmental pollutant that has been associated with severe damage in various organs, particularly the testes, causing severe testicular degeneration, seminiferous tubule

damage and necrosis. Pituitary damage, testicular degeneration and decrease in fry numbers inhibition of spermatogenesis with only a few spermatids and mature sperms remaining after cadmium exposure have already been reported. Disruptive effects of pollutants could be due to disruption of the endocrine system and the inhibition of hormone production, the deleterious effects of toxicants may be exerted on the hypothalamic-pituitary system or could be directed at gonadal steroid production. Plasma estrogen decreased after exposure of *Monopterusalbus*to cadmium, although it has been shown that cadmium contamination stimulates both vitellogenesis, plasma levels and in-vitro synthesis of estradiol in Atlantic croaker [3-5].

The heavy metals are toxic due to the low rate of its elimination from the body. The environmental contamination with heavy metals such as lead, cadmium, zinc, mercury and copper are widely distributed in the agricultural land and water. The heavy metals may be absorbed from digestive tract of the animal, some by grazing, some of these metals are toxic virtually for every system of human body, and may cause serious health problems in man, depending on their levels of contamination. Industrial agriculture like coal and oil combustion byproducts chemical and chloride plant emissions, fertilizers and sludge used in agricultural lands. Sewage effluents, some types of plastics and pesticides are considered the primary source of lead and cadmium pollutions for animals and fish. Heavy metals are cumulative poisons for man and animals, therefore the current study was planned to estimate the effect of cadmium on the nutritional status of sheep together with its effect on the liver, kidney and reproductive organs from the clinicopathologic aspect increased.[6-7]

Ancroxia, depression, emaciation, tucked up abdomen pulse and respiration rates with labored breathing, exophthaxmia and diarrhea beside frequently odema were encountered after 30 days on treatment.

Heavy metals are persistent contaminants in the environmental that come to the forefront of dangerous substances such as cadmium, lead, mercury, copper and zinc causing serious health hazard in humans and animals. The agricultural and industrial wastes partially treated or without treatment are being discharged into surface water. Such metals are absorbed from polluted water through gills, skin and digestive tract of fish by bio-concentration and bio-magnification. Chronic cadmium toxicity or "itai-iai" disease was recorded [8-9].

Cadmium toxicity was interfered with calcium/phosphorus ratio [10]. Suppression of cell mediated and humoral response of mammals exposed to sublethal dose of cadmium has been reported [11-12].

Heavy metals are recognized as cumulative toxic substances causing serious health hazards to man depending on their concentration [13].

Macroscopical examination of exposed to cadmium Sulphate for 21 days revealed a congestion of all internal organs and friable bloody liver. These findings are in agreement with those mentioned by other authors [14].

Necrobiotic changes of epithelial lining of renal tubules were observed especially the proximal convoluted tubules that were reflected on electrolytes reabsorption such as calcium, phosphorus, potassium and sodium. These findings come parallel to those previously reported.

Lamellar telangictasis resulted from rupture of pillar cells and capillaries under effect of chronic irritation of cadmium Sulphate and leads to an accumulation of erythrocytes in the distal portion of the secondary lamellae. The subepithelial space of the secondary gill lamellae was infiltrated with inflammatory cells. This finding is in agreement with that previously mentioned . Mucinous metaplasia of lamellar epithelial lining is considered as adaptive mechanism against heavy metal toxicity. These alteration are in agreement with those previously mentioned [15-16].

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