Afla-Toxins and Carcinoma in fish (Review)

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Abstract: The influence of dietary aflatoxins on body weight, immunity, and hormonal profile was studied in fish**.** The results revealed that decrease body weight, IgM, Insulin, there is carcinoma in liver of fish suffered from Afla-toxins may also induce an immunosuppressive effect on humoral immune response of fish.
[Mona S. Zaki ; Mostafa F. Abdel Zaher and Olfat Fawzy . **Afla-Toxins and Carcinoma in fish (Review).** *Cancer Biology* 2017;7(3):52-54]. ISSN: 2150-1041 (print); ISSN: 2150-105X (online). http://www.cancerbio.net. 8. doi:10.7537/marscbj070317.08.

Key words: Afla-Toxins, Carcinoma, Fish**.**

1. Introduction:

The aflatoxins are a group of structurally related toxic compounds produced by certain strains of the fungi *Aspergillus flavus* and *Aspergillus parasiticus*. Under favorable conditions of temperature and humidity, these fungi grow on certain foods and feeds, resulting in the production resulting in the production of aflatoxins, which can enter into the human food chain directly through foods of plant origin (cereal grains), indirectly through foods of animal origin (kidney, liver, milk, eggs) [1].

The most pronounced contamination has been encountered in tree nuts, peanuts, and other oilseeds, including corn and cottonseed. The major aflatoxins of concern are designated B1, B2, G1, and G2. These toxins are usually found together in various foods and feeds in various proportions [2]; however, aflatoxin B1 is usually predominant and is the most toxic. Aflatoxin M a major metabolic product of aflatoxin B1 in animals and is usually excreted in the milk and urine of dairy cattle and other mammalian species that have consumed aflatoxin-contaminated food.

Aflatoxicosis is a disease that can affect many species of fish, and results when feed contaminated with aflatoxins is eaten by the fish (Ashley, 1970). Aflatoxins are chemicals produced by some species of naturally occurring fungi (*Aspergillus flavus* and *Aspergillus parasiticus*) commonly known as molds. Aflatoxins are common contaminants of oilseed crops such as cottonseed, peanut meal, and corn. Wheat, sunflower, soybean, fish meal, and nutritionally complete feeds can also be contaminated with aflatoxins. Four major aflatoxins (AFB1, AFB2, AFG1 and AFG2) are direct contaminants of grains and finished feeds. Factors that increase the production of aflatoxins in feeds include environmental temperatures above 27°C, humidity levels greater than 62%, and moisture levels in the feed above 14%. The extent of contamination will vary with geographic location, feed storage practices and processing methods. Improper storage is one of the most important factors favoring the growth of aflatoxin-producing molds, and it is a major element that the fish producer needed to control (**Sotolu,** *et al.,* 2014).

The liver, spleen and gills of fishes treated with concurrent administration of biological antidotes and aflatoxins were within the normal limits. Liver showed normal hepatocytes with normal vacuolation consistent with glycogen deposition. Spleen also showed marked lymphocytes within the white pulp and normally scattered melanomacrophages centers. The gill lamellae were obviously separated unless the lining epithelial cells hyperplasia of the gill lamellae (Hegazi et al., 2013).

Aflatoxin treated fishes showed marked yellowish icteric coloration, pale scales and marked protrusion of the eye ball with marked eye opacity. Fin and gill rot were also noticed. Body organs examination revealed liver jaundice associated with marked gall bladder enlargement and whitish grayish nodules on the liver surface (Hegazi et al., 2013).

Aflatoxins were first isolated in turkeys and of cancer in rainbow trout fed on rations formulated from peanut and cottonseed meals. The toxins are produced as secondary metabolites by *Aspergillus flavus* and *Aspergillus parasiticus* fungi when the temperatures are between 24 and 35 °C, and they will form within many commodities whenever the moisture content exceeds 7% (10% with ventilation). Other factors may also influence aflatoxin production: substrate composition, water activity, pH, atmosphere (concentration of oxygen and carbon dioxide), microbial competition, mechanical damage to the seeds, mold lineage, strain specificity and variation, instability of toxigenic properties, plant stress, insect infestation, and use of fungicides or fertilizers It is important to remember that aflatoxin contamination is

cumulative, and the moment of harvesting and drying, and storage conditions may also play an important role in aflatoxin production.

Effect of aflatoxin on fishes and other animals have been reported by many workers. Nunez *et al*. (1991) reported hepatocellular adenoma and hepatocellular carcinoma in Rainbow trout when exposed to aflaroxin B1.Caguan *et al*. (2004) reported loss of appetite, low survival percent and decreased mean total biomass in tilapia when fed with aflatoxin contaminated feed. Faisal *et al*. (2008) reported spermatotoxic effect of aflatoxin in male wister rat.

Effect of aflatoxin on Endocrine status:

The influence of dietary aflatoxins on body weight, immunity, and hormonal profile was studied in catfish. The results revealed that, administration of aflatoxins, and aflatoxins plus fax-A-toxin 0.1% in diet for 4 months decrease body weight, IgM, Insulin, Thyroxine however there were elevation in cortisol hormone level. Afla-toxins may induce an immunosuppressive effect on humoral immune response of tilapia Nilotica in *which* was suggested by reduction of immunoglobulin (Zaki and Fawzy, 2012)

IgM, is the most important immune factor to neutralize bacteria and render them more succeptible to phagocytosis (Ingram, 1980). It is well known' that in mammals immunoglobulin production is closely related to endocrine status (Berezi, 1989) for example tyroid hormone enhance the production of immunoglobulins (Chen 1980). Cortisol intensify, suppress immunoglobulins production (Pottinger 1985). In teolosts cortisol level markedly increased following stressor exposure and elevated cortisol level results in a significant increase susceptibility to infectious. diseases (Pickering and Pottinger, 1985). The purpose of administration of fax-A-toxin particularly with Aflatoxin to know the effect of fax-A-toxin on Aflatoxin in fish. Many studies concerned the effects of cortisol on IgM production (Anderson et al. (1982).. However there is no previous reports on the effect of. Aflatoxins on serum IgM and endocrine status. Many authors observed the effect of Afla toxins *on* liverdamage. The liver enzymes are changed with observation of malignant tumours (Ostrawski, 1984; and Evmgton et al. 1994).

In conclusion, the metabolism of Aflatoxin result in the alteration of various metabolic process within hepatocytes which leads to severe serum biochemical alterations and serious pathological changes which affect fish production but treatment with ginseng and probiotic give an excellent of results and Afla-toxin reduce of the humoral immune response as detected by decrease of IgM level, body weight and cortisol elevation. Suppress IgM, Thyroxine (T4) hormone and insulin levels. Fax-A-toxin has no significant effects on afla toxins.

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9/25/2017