

Effect of some Medicinal Plants in Reducing Aflatoxicosis on Erythrocytes and Organ Weights in Albino Rat

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Abstract: The aim of this study is to show the effect of some medicinal plants such as green tea (*Camellia sinensis*) and olive oil (*Olea europaea* L.) on erythrocytes count and organ weights (liver, kidney, intestine) in female albino rat treated with aflatoxin B1. The study showed that aflatoxin B1 had significantly reduced ($P < 0.05$) some of the physiological blood standards represented by the erythrocytes count in females albino rat. The count of erythrocytes had decreased to 3800000 cell / mm³ in comparison with control which was about 5200000 cell / mm³. The study also showed that green tea and olive oil had great impact in reducing the toxic effects caused by aflatoxin B1 on female albino rats. The count of erythrocytes in treatment fed aflatoxin with green tea had increased to 4583333 cell / mm³ compared with aflatoxin B1 alone, while the treatment fed aflatoxin with olive oil rate had increased to 4600000 cell / mm³. In addition, the weight of liver, kidney, and intestine increased because of aflatoxin B1, while their weights decreased with green tea and olive oil treatments.

Keywords: erythrocytes, green tea, olive oil, aflatoxin B1, liver,

1. Introduction

Mycotoxins are secondary metabolism products have low molecular weights which produced from fungi, and more races fungal toxin-producing is: *Stachybotrys Aspergillus*, *Alternaria*, *Claviceps*, *Fusarium*, *Penicillium*, there are more than 300 known species of mycotoxins, but studies only focused on highly toxic and and carcinogenic [1]. The types of fungi that infect plants and produce mycotoxins, are attributed to species belonging to *Aspergillus* and *Penicillium* and *Fusarium* [2]. Mycotoxins can be transmitted to human's either directly through consumed contaminated food or indirectly through the consumption of animal products contaminated with toxins [1, 3]. The aflatoxin B1 is considered the most toxic compared to others types, and it causes cancer for humans and animals [4]. Aflatoxins B1 Weaken immunogenesis free from suppressing antibody formation; they repress formation of nonspecific humoral substance associated with immunity and resistance and repress phagocytosis by macrophage; they causes and repress cell mediated immunity and leukocyte migration and thymic aplasia [5]. Many

studies have shown that the biosynthesis of aflatoxin B1 can be reduced by using a number of natural materials plant [6]. Olives, are grown broadly in the parts of Asia Minor and Mediterranean basin. The major active components of olive oil involve phenolic compound, oleic acid, and squalen. The major phenolics include oleuropein, hydroxytyrosol, tyrosol, and which occur in maximum levels in virgin olive oil and have shown antioxidant activity [7]. Green tea (*Camellia sinensis*) family Theaceae has been found to possess a lot of health benefits including reduction atherosclerotic index, the Conservation of oxidative DNA damage, improvement of blood flow, liver function and oral health. Furthermore antioxidant activities and antimicrobial [8, 9].

2. Materials and Methods

2.1 Experimental design

The animals were divided into 6 groups
During the experiment (30 days)

Group 1: control fed on normal saline.

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Group 2: fed only on green tea 1g/kg.

Group3: fed only on olive oil 1 ml/kg.

Group 4: fed only aflatoxin 500 $\mu\text{g}/\text{kg}$.

Group 5: fed aflatoxin with green tea 1g/kg.

Group 6: fed aflatoxin 500 $\mu\text{g}/\text{kg}$ with olive oil 1ml /kg.

dosaging to a lbino rat had been process for 30 days three days later , the abino rat were observe for clinical symptoms and change . The experiment animals were drugged by chloroform and the withdrawal of blood from the heart and has the process of blood was saved in the tubes (EDTA) . The liver, kidney, intestine are brought out of the abdomen and then weighted.

2.2 Preparation of green tea extract

Ten grams of green tea should be mixed with 100 ml of distilled water in a steriled glass beaker and left for two days at room temperature and filtered by Whatman No.1 papers. The resultant is concentrated by oven and kept in 4C°until use. [10].

2.3 Preparation of aflatoxin B1

Aflatoxin B1 are prepped in college of science / Babylon University /Iraq from *Aspergillus flavus* by used TLC technical [11].

2.4 Erythrocyte count (RBCS)

The red blood cells have been account the by using Hayem's solution and Haemocytometer[12].

Statistical analysis

The results were analyzed by using One-Way ANOVA in SPSS software, and the treatment means were compared with the Least Significant Difference (L.S.D) at the level of probability [0.05.

3. Results and dissection

3.1 The effect of green tea and olive oil on erythrocyte Count of female albino rat exposed to aflatoxin B1.

The study showed table [1] that aflatoxin B1 had significantly reduced ($P < 0.05$) some of the physiological blood standards represented by the erythrocytes count in females albino rat The count of erythrocytes had decreased to 3800000 cell / mm^3 in comparison with control which was about 5200000 cell / mm^3 . Treatment of rat with aflatoxin B1 500 $\mu\text{g}/\text{kg}$ and 1gm /kg of green tea showed increased RBC count 4583333 cell / mm^3 compared to aflatoxin alone. In group given aflatoxin B1 with olive oil also showed increase RBC count has reached 4600000 cells / mm^3 . The mechanism by which AFB1 Compounded pathogenesis of anemia could involve down organization of erythropoietin

activity [13] by aflatoxin B1. Decline in erythrocytes has been contributed to reduction in erythropiosis in bone marrow and faster rate of destruction of peripheral RBC in spleen. Decline in Hb can be linked with reduction in size of RBC, impaired biosynthesis of heam in bone marrow or Because of reduction in rate of formation of erythrocytes [5]. This may be due to role of olive oil in improving blood standards to its content of unsaturated fatty acids such as oleic acid and phenolic compounds that act as the process of oxidative stress [14]. The role of green tea is because it contains vitamin C, which affects the red blood cells indirectly as working to protect them from the damage due to the oxidation processes, through its influence on the vitamin E content in the membranes cells, which play a role in protecting cell membranes from oxidative stress which reduces rates damage of red blood cells [15].

Table 1: The effect of green tea and olive oil on erythrocyte Count of female albino rat exposed to aflatoxin B1.

Number	Groups	Erythrocyte Count ell/ mm^3
1	Group 1	5200000
2	Group 2	4900000
3	Group 3	5500000
4	Group 4	3800000
5	Group5	4583333
6	Group 6	4600000
LSD(0.05)		555645

3.2 The effect of green tea and olive oil on organ weights of female albino rat exposed to aflatoxin B1.

The study showed that aflatoxin had significantly increased ($P < 0.05$) of the organ weights represented by (liver, kidney, intestine) in females albino rat, the liver weight increased to 6.89 g Figure [1] comparison with control which was about 5.43 g , while kidney weight had increased to 0.65g as compared to control Figure [2] which was Aflatoxin affected the intestine weight for it increased to 0.54 g Figure [3] .the result also showed that olive oil had great impact in reducing the toxic effects caused by Aflatoxin B1 on albino rats. In animal treated aflatoxin and olive oil showed decrease liver, kidney, intestine weight has reached to 5.74, 0.55, 0.42 g respectively. In addition green tea had great impact in reducing the aflatoxicoses, the liver weight had significantly decreased for it reached 5.83g. Aflatoxins raise lipid peroxidation in kidney tissues and liver, induce cellular damage causing impaired morphology of organs [16, 17]. The liver is the main target organ for aflatoxins toxicity and chronic exposure to low levels of aflatoxins in food stuffs causes fibrosis and liver cancer [18]. A study conducted by [19] showed Aflatoxins B1 significantly reduced body weight gain (20-30%) and

increased the relative weights of the kidney inducing congestion in renal sinusoids [20]. Aflatoxins B1 is eliminated mainly through the kidneys, the aggregation of a comparatively high concentration of toxin weaken the excretory function and result in congestion with subsequent morphological disorders [21]. Green tea reduces the extra weight of liver due to the accumulation of fat. In addition has a role in reducing the fat absorbed from the intestines. [22]. Olive oil phenolic compounds explained strong antioxidant properties against lipids [23]. A study conducted by [24] showed the positive effects of olive oil may be belong to its richness in MUFA, mainly oleic acid which has many effects on lipid profiles and peroxidation in rabbit hepatic mitochondria .

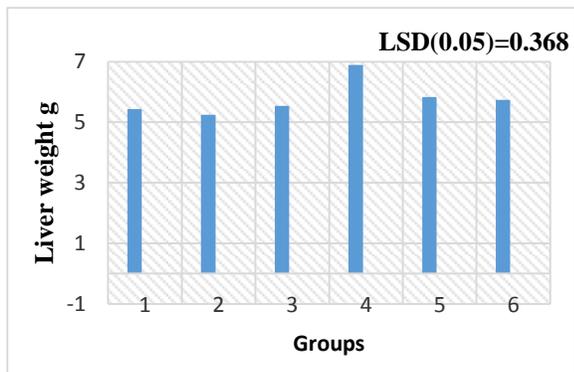


Figure 1 : The effect of green tea and olive oil on liver weight of female albino rat exposed to aflatoxin B1

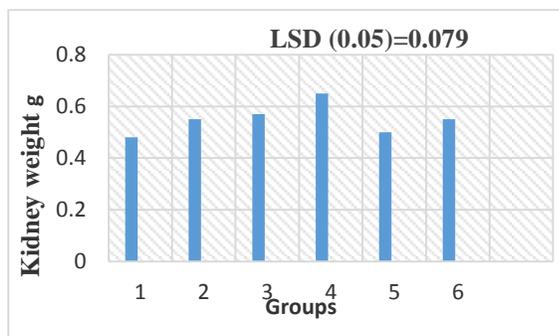


Figure 2: The effect of green tea and olive oil on kidney weight of female albino rat exposed to aflatoxin B1.

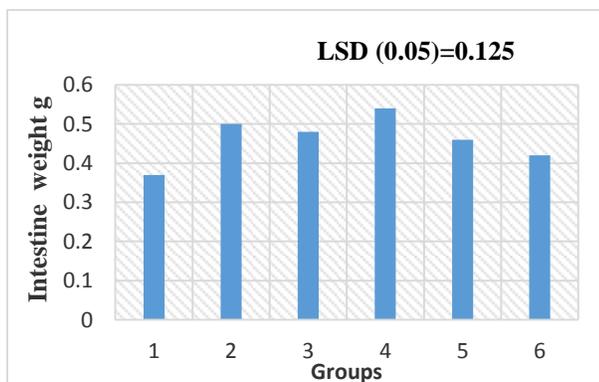


Figure 3: The effect of green tea and olive oil on intestine weight of female albino rat exposed to aflatoxin B1.

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