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# **Effect of Nigella Sativa on aflatoxin induced hepatic damage in poultry**

*A thesis presented By*

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## **6. SUMMARY**

This study was conducted to investigate the potential protective effect on *Nigella sativa* against aflatoxin-induced liver damage in chicken.

This study has been conducted on forty (40) broiler chickens and their weight ranged from 40-45grams for 4 weeks. The chickens were divided into four equal groups (10 chicks per group) as follow:

**The first group (G1):** It was kept as a control group in which chicks were fed an experimental ration free from Aflatoxin and *Nigella sativa*.

**The second group (G2):** Chicks were fed an experimental ration contain Aflatoxin powder at 0.3 mg/kg of diet.

**The third group (G3):** Chicks was received an experimental ration containing *Nigella sativa* powder at concentration of 1% (10 g of *Nigella sativa* powder /Kg of diet) .

**The fourth group (G4):** chicks in present group were provided with an experimental ration containing *Nigella sativa* powder at concentration of 1% (10 g of *Nigella sativa* powder /Kg of diet) and aflatoxin powder at 0.3 mg/kg of diet.

### **Sampling:**

#### **A) Blood samples:**

Blood samples were collected from wing vein for separation of serum that was used to determine liver transaminases, Total protein, Albumin, Interlukin-6 (IL-6) and Tumor necrosis factor (TNF-  $\alpha$ ) in all studied group of chickens

#### **B) Tissues samples:**

After collection of blood samples, Chicks were slaughtered and tissue samples were collected from liver, then washed with normal saline and stored in three parts:

- 1) The first compartment of liver tissue was stored in phosphate buffered saline at -20°C for determination of: GSH, GST, NO and MDA.

- 2) The second part of liver was fully immersed in 10% formalin for histopathological examination. Paraffin sections of 5 $\mu$  thick were prepared and stained with hematoxylin and eosin and examined microscopically
- 3) The third part of liver was immediately minced into small pieces using sharp clean scalpel blade, inserted in eppendorf tube contain RNA lysis solution supplied from **Qiagen** with equal volume and stored as soon as possible at -20°C for the determination of hepatic B cell lymphoma-2 (Bcl-2) and Bcl-2-associated X protein (BAX) gene expression using SYBR Green real time PCR.

The outcomes result were statistically analyzed and represented in 14 tables and 14 graph. The general finding can be summarized as follow:

### **The Effect of Nigella sativa:**

- The mean value of body weight in nigella sativa group was higher than the other groups.
- Nigella sativa preserves normal level of serum liver transaminase activities, albumin and total protein.
- Nigella sativa maintain normal level of serum TNF- $\alpha$  and IL-6 .
- Nigella sativa led to increase in GSH and GST activities in liver tissues.
- Nigella sativa maintained level of MDA and NO in normal ratio.
- Nigella sativa supplementation resulted in a significant increase in hepatic BCL-2 expression and a decrease in BAX expression.

### **The Effect of Aflatoxin:**

- Aflatoxin decrease mean value of body weight than other group.
- Aflatoxin caused increase in serum liver transaminase activities while decrease level of albumin and total protein .
- Aflatoxin lead to increase level of serum TNF- $\alpha$  and IL-6 than normal.
- Aflatoxin led to decrease in GSH and GST activities in liver tissues.
- MDA and NO level increase in aflatoxin group than normal level.
- Aflatoxin supplementation resulted in slight change in hepatic BCL-2 expression and a increase in BAX expression.

**CONCLUSION**

The present study showed that *Nigella sativa* alleviates the aflatoxin-induced liver damage by its anti-inflammatory, antioxidant, and antiapoptotic effects. Therefore, *Nigella sativa* can be used as a feed additive to poultry diets to alleviate any potential aflatoxin toxicity from contaminated diets.

**Recommendation:**

From our result we recommended to add *nigella sativa* 1% to chicken daily fed ration to protect them from aflatoxin toxicity and improving performance of broiler.