



Effect of adding different concentrations of plantago lanceolata L on growth performance and immune response in Rose (308) strain broiler chickens

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Abstract

The aim of this research is to Study the effect of adding 1 gm, 3 gm and 5 gm of plantagolanceolata powder per kg of basic diet food on bodyweight, Feed intake, Blood urea, Creatinine and Antibody titer against Newcastle disease of broilers. Two hundred (200) unsexed broilers of Rose (308) strain were used in this experiment and the experiment was performed for the day 1 of chicken life until five weeks (35 day). The broilers were divided in to four group and each group contain 50 broilers, the first group (T1) were fed on a basic diet, the second group (T2) they were fed on basic diet plus 1 gm from plantagolanceolata powder per kg of feed, the third group (T3) they were fed on basic diet plus 3 gm from plantagolanceolata powder per kg of feed and the fourth group (T4) they were fed on basic diet plus 5 gm from plantagolanceolata powder per kg of feed. Environmental temperature in the first week of life was 32°C and decreased 2°C a week till to 25°C till the end of the experiment. As for the light. It was provided one hour darkness and 23 hour light .At day 35th of age the blood sample from wing vein were collected in a test tube without anticoagulant. The serum was separated by centrifugation for 5 minutes at 3000 rpm and stored in a deep freeze (-20) until analysis.

Through the current study and after the end of the experiment there is a significant ($P < 0.05$) increase in weight gain in T3 group that received 3 gm of plantagolanceolata which also showed a significant ($P < 0.05$) decrease in feed intake when compared to the other groups. While blood urea show a significant ($P < 0.05$) increase in T3 when compared to the other group. On the other hand Creatinine level show no significant deference between groups, while T4 show a significant ($P < 0.05$) decrease in the Antibody titer against Newcastle disease.

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KeyWords: broilers, Rose (308), plantagolanceolata, bodyweight, Feed intake.

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Introduction

Plantago lanceolata is a species of flowering plant in the plantain family *Plantaginaceae*. It is known by the common names like ribwort plantain and narrow leaf plantain (BSBI list, 2007; Al-Khazraji, 2009).

The plant is a rosette - forming perennial herb with leafless silky hairy flower stems (10-40cm or 3.9 - 15.7 in). The basal leaves are lanceolata spreading or erect, scarcely toothed with 3-5 strong parallel veins narrowed to a short petiole. The flower stalk is deeply furrowed ending in an ovoid inflorescence of many small flowers each with a pointed bract (Blamey, et al., 2003).

It is native to temperate Eurasia, widespread throughout the British Isles but scarce on the most acidic soils (pH < 4.5). It is present and widespread in the Americas and Australia as an introduced species. Considered to be an indicator of agriculture in pollen diagrams *Plantagolanceolata* has been found in western Norway from the early Neolithic onwards which is considered an indicator of grazing in that area at the time (Hjelle, et al., 2006)

Plantagolanceolata is a species of plants that are widely distributed in pastures and green areas in the temperate world. It has been used for various medicinal purposes for centuries such as related to the skin, wound healing, inflammation, disorders of respiratory and digestive organs, reproductive system, blood circulation and cancer because of contained a number of exceptional properties (Temür & Sema., 2019).

Plantagolanceolata is used frequently in herbal teas and other herbal remedies (Val plants herbal ice tea (archived. 2009). A tea from the leaves is used as a cough medicine. In the traditional Austrian medicine *Plantagolanceolata* leaves have been used internally (as syrup or tea) or externally (Freshleaves) for treatment of disorder of the respiratory tract, skin, insect bites and infectious diseases (vogl S., et al., 2013).

Previous studies have shown that the *plantago* genus contains five chemical classes of biologically active compounds, namely flavonoids, monoterpenoids, triterpenoids, iridoid glycosides and phenolic compounds

(Stewart 1996; Chiang et al. 2003; Moore .et al. 2006).

Plantagolanceolata seed contains Glucosinolate (GS) exist in high concentrations associated with the *Plantaginaceae* family plants (Talalay and Fahey., 2001 and D,Antuono et al., 2008). These compounds have great importance in human and animal health as ant carcinogenic and antioxidant (Kim et al., 2004).

The *plantagolanceolata* seeds contain flavonoids and phenolic compounds which have an effective antioxidant properties both in vitro on in vivo by inhibition of the free radical to being a mineral - attracting substance called the chelating agent (Barillari et al., 2005; Alam et al., 2007).

Plantagolanceolata seeds also contain a high percentage of calcium, magnesium, sodium, iron, potassium, phosphorus and iodine as well as being rich in carotene and vitamins such as vitamin K, C, E, and most types of vitamin B groups such as Biotin (B12), Riboflavin (B2) and thiamine (B1). (Barillari et al., 2005; Cartea et al., 2011).

So that *Plantagolanceolata* are used mainly in inflammation of the upper respiratory tract and accelerate skin regeneration, showing bactericidal and anti - diarrheal effect. It can also be used against insect and snake bites, toothaches or as an immunity enhancer (Grigore A. et al. 2015).

Material and methods:

Two hundred (200) unsexed one day old broilers of Rose (308) strain broilers of Rose (308) strain were used in this experiment, which were prepared from Al-debla hatchery in AL-dewanea Governorate. The broilers were divided in to four group and each group contain 50 broilers.

The first treatment group (T1):- they were fed on a basic diet, and the diet was given control without any addition.

The second treatment group (T2):- they were fed on basic diet plus 1 gm from *plantagolanceolata* powder per kg of feed.

The third treatment group (T3):- they were fed on basic diet plus 3 gm from *plantagolanceolata*



powder per kg of feed.

The fourth treatment group (T4):- they were fed on basic diet plus 5 gm from plantagolanceolata powder per kg of feed.

Environmental temperature in the first week of life was 32°C and decreased 2°C a week till to 25°C till the end of the experiment. As for the light. it was provided one hour darkness and 23 hour light .

At the end of the experiment the blood was taken from the wing vein and the blood was placed in special gel tube not containing any anticoagulant. The serum was separated by centrifugation for 5 minutes at 3000 rpm and stored in a deep freeze (-20) until analysis.

Result:

The current study show that there is a significant (P<0.05) increase in the Body weight

in the T3 group when compared to the other, on the other hand there was no significant deference between T1, T2 and T4.

Feed intake show a significant (P<0.05) decrease in T3 when compared to the other group, also T4 show a significant (P<0.05) decrease when compared to T1 and T2, on the other hand there was no significant deference between T1 and T2 .

Serum urea showed a significant increase in T 3 group when compared to other groups, while there is no significant deference between T1, T2 and T4.

Serum Creatinine level showed no significant difference between all experiment groups.

ND Anti body titer showed a significant decrease in T4 group when compared to the other group. While there is no significant deference between T1, T2 and T3.

Table (1): effect of adding 1,3and 5 gm of plantagolanceolata on the boilers.

Test Group	Body weight (gm)	Feed intake	Serum urea	Creatinine	ND Anti body titer
T 1	2194.51 ±41.71 B	1000.0 ±52.33 A	0.38± 11.45 B	0.01± 0.38 A	0.54± 7.69 A
T 2	2157.15 ±47.86 B	995.60 ±57.05 A	0.40± 11.10 B	0.02± 0.39 A	0.61± 8.14 A
T 3	2398.97 ±28.14 A	895.10 ±58.53 C	0.19± 15.92 A	0.02± 0.37 A	0.12± 7.70 A
T 4	2200.38 ±33.73 B	965.22 ±35.33 B	0.55± 12.03 B	0.01± 0.42 A	0.61± 5.77 B

Discussion:

The study conclude from the results of the experiment that there is an improvement in the average live body weight when adding plantain , which may be due to the superiority of the addition treatments to the active compounds present in the composition of the plantain , which improve digestion through digestive enzymes and reduce constipation and cramping as well as bloating through dietary fiber that improves efficient absorption of nutrients in the alimentary canal(El-Aal. et al., 1986).

The active compounds found in medicinal

plant extracts generally have an important role in preventing the growth of harmful microorganisms in the intestines and positively affect the health and productive performance of poultry (El-Hack et al., 2013).

The improvement in the addition treatments to plantagolanceolata is due to the fact that it contains vitamins and mineral elements that provide what the organism needs for the growth of the body(Blumenthal , 2003)

the results of this experiment agreed with (Kalia et al., 2017) when adding plantain as they noticed that there were significant differences in body weight gain in all treatments to which the plant



was added.

plantagolanceolata seed contain antioxidant , anti-fungal and anti-bacterial been attributed to the existence of pinocamphone , isopinocamphone and β - pinene which enhance the two improvements in health , body and activity as well as improvement digestive enzymes (Gollapudi S. et al., 1995).

The present study showed that there is a reduce in feed intake with increase in body weight .it belived that plantagolanceolata can case a fast growth rate and low feed conversion ratio. plantago seed has raised the metabolic requirement pf broiler chickens which has been linked to an increase in the occurrence of metabolic illnesses such as ascites (Fathi et al., 2016). They revealed that the fast growth rate and low feed conversion ratio of plantago seed has raised the metabolic requirement pf broiler chickens which has been linked to an increase in the occurrence of metabolic illnesses such as ascites (Fathi et al., 2016).

Blood urea and creatinine levels in broiler chickens received plantago showed a significant increase compared with control group. The test of creatinine and blood urea levels is one of important and reliable diagnostic markers in renal function , because these parameter one of the metabolism products which their reabsorption in the renal tubules , so any increase in their levels in blood reflect abnormal functional status of kidney (Al-Okbi et al.,2014) .

Elevation in blood urea and creatinine levels may be due to the effect of oxidation stress induce by plantagolanceolata treatment that lead to lipids and proteins oxidation , particularly the lipid of plasms membrane of renal tubules cells which effected negatively on permeability of cells membrane hence increase the flow of blood urea and creatinine from kidney tissues to the blood stream that causes increase creatinine and urea levels (Al-taai et al., 2015).

The improvement in blood urea and creatinine levels may be due to the fact that plantagolanceolata works as nephroprotective and a diuretic, it activates the kidney to increase urine excretion (Elgazar and Aboraya, 2013)

Plantagolanceolata seed have potent anti-oxidant

compounds provide protection for body tissue as vit C and lipid peroxidation inhibitor then return normal kidney tissues and reduce blood urea and creatinine concentration (Kalender et al., 2010 ; Hussein , 2012 and Hassan ,2016).

The positive effects in the immune response against Newcastle disease are attributed to the role of medicinal plants that work to strengthen the immune system because they contain high percentage of effective antioxidant chemical compounds such as phenolic compounds act as cell protection lead to enhance immune response (Golian et al., 2010).

The immune system secretes cytokines and protein substances that are used to regulate different types of immune cells and make it with in the beneficial limits of the body and organize between the cell of the immune system with the cells of the endocrine and nervous system and it has an important role in raising the level of humoral and cellular immunity (Awaad et al.,2010) .The amount and sources of protein a direct impact on the immune response of chicks, because it affects the number of lymphocytes (T.lymphocyte) and then in the humeral immune response, in addition to the effect of age and genetic makeup (Cheema, 2000).

Conclusion:

From the current study, we conclude that Plantagolanceolata caused an increase in body weight and a decrease in the amount of food taken, which increased the growth rate as well as raising the bird's immunity.

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