

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Medicinal plants and its effect on some physiological traits in birds: A Review.

Salman KAA*.

Department of Animal Production, College of Agricultural Engineering Sciences, University of Baghdad, Iraq.

ABSTRACT

Since of the development in our life and because of increasing number of human thus that requires more interesting in human foods, to accommodate population growth. Birds are one of the most important foods in human life because they have high biological value, whether meat or egg, so the interesting of birds upbringing is necessary. And because of the infection of birds with infectious different diseases that lead to decrease in birds performance and that leads to increase in veterinary costs and therefore high production costs, so researchers interested for studying how to find adrugs without any side effct on birds health, herbal plants preparations help in the digestion process and being a component of nature, these preparations are considered safe, cost effective and environment friendly with no side effect. Hence, their inclusion in the diet should be encouraged to enhance the bird's performance, improve feed utilization and physiological traits.

Keywords: Herbal plants, physiological traits, birds

**Corresponding author*

INTRODUCTION

During the last decades, there is increasing interest to unlock the secrets of ancient medicinal plants remedies. For this purpose, various strategies have been developed biological screening, isolation as well as clinical trials for a variety of plants (1).

Herb is defined as a flowering plant whose stem above ground does not become woody and a plant when valued for its medical properties, flavor, scent, or the like (2).

Because medicinal plants contain compounds known for their absorption of cytotoxic effects, therefore, the demand for knowledge of medicinal plant species has increased because of these advantages in the preparation of medicines (3), and because of the negative effects when using drugs and antibiotics, which lead to hypersensitivity and immune inhibition, in the other hand, there was a need for the development of anti-microorganisms drugs, treating diseases and improvement of health (4).

Medicinal plants contain a secondary metabolism compounds involving flavonoids, flavones, anthocyanins, lignans, coumarins, isocatechins and catechins (5). These bioactive compounds are mainly responsible for the antioxidant prosperity of medicinal plants, as they are considered an important source in the pharmaceutical industry and healthcare as well as used as a source for nutrition, perfumes and flavor (5).

Thus, increased interest to medicinal plants because they contain effective compounds against anti-microbial, anti-inflammatory, anti-microbial and anti-oxidant (6), though it was widely used in animal's farm feeding to improve their performance and products (7). Therefore, the studies aimed to know the effect of medicinal plants on some blood parameters on birds.

2- Active Principles (Chemical constituents of medicinal plant):

All plants produce chemical compounds which give them an evolutionary advantage, such as defending against herbivores or, in the example of salicylic acid, as a hormone in plant defenses (8). these phytochemicals have potential for use as drugs, and the content and known pharmacological activity of these substances in medicinal plants is the scientific basis for their use in modern medicine, if scientifically confirmed(9), its can be divided in to:

a- Alkaloids: They are the alkaloids that turn into salts by combining them with acids. Its properties are toxic, time-consuming, nitrogen-containing and excreted in special cells and tubes that are soluble in water and odorless. It is derived from protein substances more than is derived from carbohydrates. The effect of this group on humans and animals is that it is toxic and has a high temperature (10), such as Nicotina tubacum and active compound is nicotin and Datura stramonium and active compound is datorin (11).

b- Glycosides: They are alkaline in their properties but are more derived from carbohydrates than proteins as in alkaloids. Glucoseide is composed of glucose sugar with organic acids and melts in water and alcohol (12). The most important substances covered by clocosides:-

Tannin: These substances act to precipitate proteins and mucous substances and cause constriction in the blood vessels, act as a receptor and stop bleeding and treatment of burns. Whereabouts are found in Peel the plants and bark as well as a small amount in the rest of the plant (13).

Saponin: They are compounds that have a dense foam composition with water and are involved in the manufacture of toothpaste and cosmetics. The most important plants that contain this substance are sesame seeds and milking plants (14).

Glucoside Anthelmentic.

Phenols: These substances are characterized by the treatment of rheumatism and in the reduction of temperature. Salicylic acid is the source of aspirin and is found in willow, thyme, digitals, mustard and black.

Some of the clocosides are of a soapy nature that generate soapy foam in the water and cause the fish to die for their effect on cold blood cells (15).

Blood physiology:

Haematological profiles both in humans and animals are an important index for the physiological state, haematology normally encompasses the evaluation of full blood count (FBC) and the organ involved in producing blood (16), the FBC parameters include Red blood cell RBC (m/1ml), White blood cell RBC (m/1ml), haematocrit (packed cell volume PCV %), haemoglobin estimation (mg/dl) indices (17), full blood count gives information about the animal cells, providing its general health status. Abnormally high or low counts may indicate the presence of many forms of diseases, disease conditions or toxicity (17).

The imporvment in blood haematology indicate improved cells capacity to oxygencarrying, which led the imporvment of the better availability of nutrients (18), therefore, studied intend to know the effect of herbal plants on blood haematology.

Used of medicinal plants leds to increased in blood haematolgy because that reduces the exposure of birds to any type of stress by increasing the secretion of thyroxine hormone, thus increased metabolic rats and increased biologicl actoins in body, and then build muscle tissue in the body, which results in maintaining a high rate of total protein and other parameters in the blood, add to that medicinal plants play a role in blood immunity because it’s effect of immunoglobulin’s concentration in serum, this reflects its ability to enhance cellular immunity and raise body immunity (19), increased albumin:globulin ratio is believed to be linked with th proved liver function because of the administration of peppermint extract (20).

Serum biochemistry is a labile biochemical system which can reflect the condition of the body and the changes happening to it under the influence of internal and external factors. It is possible that both the short feeding period and the relatively low doses may have been implicated in the failure of medicinal plants essential oil to reduce plasma triglyceride and cholesterol level. Furthermore, it is well known that the absence or presence of cholesterolemic effects of dietary components in an animal depend on various factors such as breed, gender and age, and also on the composition of the feed (21).

Some medicinal plants are basically used as feed supplements for chickens or for medicinal purposes thereby becoming involved in a cascade of physiological reactions, that in turn lead to the alteration of serum biochemical parameters (22).

Medicinal plants play rols in birds feed ansit sugusted it have reduced concentrations of serum cholesterol, HDL and LDL, that belonge of herbal plants effects and due to active compounds in herbal plants that have the ability to inhibit hepatic 3-hydroxy-3-methylglutaryl coenzyme A reductase, cholesterol 7ahydroxylase, and fatty acid synthetase and in representative pentose-phosphate pathway, likely are the ways in which these treatments exert their effects on lipid metabolism activity in liver, a key regulatory enzyme in cholesterol synthesis (23,24), or maybe due to the lowered the deconjug tion of bile salts that led to reduced impairment of fat emulsification and lipid absorption (25).

Table 1: Effect of different herbs on the physiological functions of Poultry

No.	Plant	Effect	Reference
1	Amla fruit powder	Microbial load of gram negative <i>E. coli</i> decreased and beneficial gram positive <i>Lactobacilli</i> increased significantly as compared to control group, Significantly higher values of Hb%, lowest serum cholesterol value were reported in broilers. Heterophils count was also significantly reduced in amla supplemented group as compared to control group.	26
2	Tulsi extract	Significantly increased the glutathione peroxidase activity, ascorbic acid level in serum	27
3	Cinnamon	Enhanced antioxidant status	28,29

4	<i>Moringa oleifera</i>	Immune-stimulant activities	30
5	Rosemary	Improved antioxidant capacity of products	31
6	Shatavari	Augments the appetite and stimulates the liver, possess anabolic properties	32
7	Basil seeds (<i>OCIMUM BASILICUM L.</i>)	significant difference ($P < 0.05$) in Blood hemoglobin Hb (mg/dl), Packed cell volume PCV (%), red blood cell RBC (m/1ml) and White blood cell WBC (m/1ml)	33
8	Arsilvon Super	significant effects ($P < 0.05$) on red blood cells RBC (m/1ml)	34
9	garlic	significant decreased ($P < 0.05$) in triglyceride (mg/dl) and HDL (mg/dl) levels in 7.5 kg/ ton	35

CONCLUSION

From the results of this study we conclude that use medicinal plants play an important role in birds performance through its biological effect such as anti-oxidant, anti-inflammatory, anti-bacterial, anti-viral and anti-fungal.

REFERENCES

- [1] Khaligh, F., Ghorbanali, S., Karimi, A. and Vaziry, A. 2011. Evaluation of different medicinal plants blends in diets for broiler chickens. *J. Med. Plant. Res.*, 5(10):1971-1977.
- [2] Vinus, S., Dalal, R., Sheoran, N., Maan, N.S. and Tewatia, B.S. 2018. Potential benefits of herbal supplements in poultry feed: A review. *The Pharma Innovation Journal*; 7(6): 651-656.
- [3] Sharifi, S.D., Khorsandi, S.S.H. and Khadem, A.A. 2013. The effect of four medicinal plants on the performance, blood biochemical traits and ileal microflora of broiler chicks. *VETERINARSKI ARHIV* 83 (1), 69-80.
- [4] Bibi, Y., Nisa, S., Chaudhary, F.Z. and Muhammad, Z. 2011. Antibacterial activity of some selected medicinal plants of Pakistan. *BMC Complementary and Alternative Medicine* 2011, 11:52:1-7.
- [5] Ahmad Dar, R., Shah Nawaz, M. and Qazi, P.H. 2017. General overview of medicinal plants: A review. *The Journal of Phytopharmacology*, 6(6): 349-351.
- [6] WHO, 2005. World Health Organization. Consultation on Selected Medicinal Plants. Vol. 4, Salerno-Paestum, Italy.
- [7] Fallah, J. and Nobakht, A. 2014. Evaluating the Effects of Different Levels of Medicinal Plant Powder of *Teucrium Polium* on Performance, Carcass Characteristics, Intestinal Morphology and Antioxidant Status of Blood Serum in Broiler. *European Online Journal of Natural and Social Sciences*, 3(3):249-257.
- [8] Hayat, S. and Ahmad, A. 2007. *Salicylic Acid – A Plant Hormone*. Springer Science and Business Media.
- [9] Ahn, K. 2017. The worldwide trend of using botanical drugs and strategies for developing global drugs. *BMB Reports*. 50 (3): 111–116.
- [10] Aniszewski, T. 2007. Alkaloids – secrets of life. Amsterdam: Elsevier. p. 182.
- [11] Elumalai, A., Eswariah, M. and Chinna, S. 2012. Herbalism - A Review. *International Journal of Phytotherapy*. 2 (2): 96–105.
- [12] Wang, Z., Pei, M., He, M., Peng, Y. and Xiao, P. 2013. Evaluation of the content variation of anthraquinone glycosides in rhubarb by UPLC-PDA. *Chemistry Central Journal*. 7 (1): 43–56.
- [13] Aiyelaagbe, O.O. and Osamudiamen, P.M. 2009. Phytochemical screening for active compounds in *Mangifera indica* leaves from Ibadan, Oyo state. *Plant Sciences Res.*, 2(1):11 – 13.
- [14] Liu, M.J., Z. Wang, R.N.W. and Wu, Q.Y. 2005. Diosgenin induced cell cycle arrest and apoptosis in human leukemia K562 cells with the disruption of Ca^{2+} homeostasis cancer chemother. *Phar.*, 55(1): 79 – 90.
- [15] Lee, Y.S., Park, J.S., Cho, S.D., Son, J.K., Cherdshewasart, W. and Kang, K. S. 2002. Requirement of metabolic activation for estrogenic activity of *Pueraria mirifica*. *Journal of Veterinary Science*. 3 (4): 273–277.
- [16] Khan, T.A. and Zafar, F. 2005. Haematological study in response to varying doses of oestrogen in broiler chicken. *International Journal of Poultry Science* 4 (10): 748-751.
- [17] West, G.D. and Haines, V.L. 2002. Haematology and serum biochemistry values of captive Attwater's prairie chickens (*Tympanuchus cupido attwateri*). *Journal of Zoo and Wildlife Medicine* 33 (2): 122-124.

- [18] Oleforuh-Okoleh, V.U., Ndofor-Foleng, H.M., Olorunleke, S.O. and Uguru, J.O. 2015. Evaluation of growth performance, haematological and serum biochemical response of broiler chickens to aqueous extract of ginger and garlic. *Journal of Agricultural Science* 7 167–174.
- [19] Al-Zuhairi, Z.A and Al-Tabari, A.S. 2013. Effect the addition of Anis seed (*Pimpinella anisum* L.) powder on production performance and some blood and biochemical parameters in broiler chickens. *Kufa J. for Vet. Med. Sci.* 4(2):12-20.
- [20] Khodadust, M.R., Samadi, F., Ganji, F., Jafari Ahangari, Y. and Asadi, G.H. 2015. Effects of Peppermint (*Mentha piperita* L.) Alcoholic Extract on Carbon Tetrachloride-induced Hepatotoxicity in Broiler Chickens Under Heat Stress Condition. *Poult. Sci. J.*, 3 (1): 1-16.
- [21] Toghyani, M., Toghyani, M., Gheisari, A., Ghalamkari, G., and Mohammadrezaei, M. 2010. Growth performance, serum biochemistry and blood hematology of broiler chicks fed different levels of black seed (*Nigella sativa*) and peppermint (*Mentha piperita*), *Livest. Sci.*, 129, 173–178.
- [22] Ewuola, E.O. and Egbunike, G.N. 2008. Haematological and serum biochemical growing rabbit bucks fed dietary fumonisin. *African Journal of Biotechnology* 7 (23): 4304-4309.
- [23] Yu, S.G., Abuirmeileh, N.M., Qureshi, A.A. and Elson, C. E. 1994. Dietary β -ionone suppresses hepatic 3-hydroxy-3-methylglutaryl coenzyme A reductase activity. *J. Agric. Food Chem.* 42:1493–1496.
- [24] Khattak, F., Ronchi, A., Castelli, P. and Sparks, N. 2014. Effects of natural blend of essential oil on growth performance, blood biochemistry, cecal morphology, and carcass quality of broiler chickens. *Poultry Science* 93 :132–137.
- [25] Guban, J., Korver, D. R., Allison, G. E. and Tannock G. W. 2006. Relationship of dietary antimicrobial drug administration with broiler performance, decreased population levels of *Lactobacillus salivarius*, and reduced bile salt deconjugation in the ileum of broiler chickens. *Poult. Sci.* 85, 2186-2194.
- [26] Dalal, R., Ahlawat, P.K., Sonu, V., Panwar, V.S. and Tewatia, B.S. 2018. Evaluation of Antimicrobial Effect of *Embllica officinalis* Fruit Powder on Intestinal Micro-biota in Broilers Chicken. *Int. J. Curr. Microbiol. App. Sci.*; 7(04):1432-1438.
- [27] Vasanthakumar, P., Sasikumar, P., Pangayarselvi, B. and Purushothaman, P.M.R. 2013. Performance of broiler chicken fed tulsi leaf powder and leaf extract supplemented diets during summer to alleviate heat stress. *Indian J Anim. Sci.*, 83(9):930-931.
- [28] Feix, S., Faixova, Z., Placha, I. and Koppel, J. 2009. Effect of *Cinnamomum zeylanicum* Essential Oil on Antioxidative Status in Broiler Chickens. *Acta Vet. Brno.*; 78:411-417.
- [29] Al Kassie, G.A. 2009. Influence of two plant extracts derived from Thyme and Cinnamon on broiler performance. *Pakistan Vet. J.*; 29:169-173.
- [30] Reddy, V.P., Thangavel, A., Leela, V. and Narayana, R.K. 2009. Antioxidant enzyme status in broilers: role of dietary supplementation of tulsi (*Ocimum Sanctum*) and selenium. *Tamil Nadu J Vet. and anim. sci.*; 5(6):251-56.
- [31] Lopez-Bote, C.J., Gray, J.I., Gomaa, E.A. and Flegal, C.J. 1998. Effect of dietary administration of oil extracts from rosemary and sage on lipid oxidation in broiler meat. *Br. Poult. Sci.*; 39:235-240.
- [32] Sharma, S., Dahanukar, S, and Karandikar, S.M. 1986. Effects of long term administration of the roots of Ashwagandha (*Withania somnifera*) and Shatavari (*Asparagus racemosus*) in rats. *Indian Drugs.*; 23:133-139.
- [33] Onwurah, F. B, Ojewola, G.S. and Akomas, S. 2011. Effect of basil (*OCIMUM BASILICUM* L.) on coccidial infection in broiler chicks. *Academic Research International*, 1(3):438-442.
- [34] Qamar, H.S., Ul-Haq, A., Asghar, N., Rehman, S., Akhtar, P. and Abbas, G. 2015. Effect of Herbal Medicine Supplementations (Arsilvon Super, Bedgen40 and Hepa-cure Herbal Medicines) on Growth Performance, Immunity and Haematological Profile in Broilers. *Advances in Zoology and Botany* 3(2): 17-23.
- [35] Al- Massad, M., Al-Ramamneh, D., Al-Sharafat, A. and Hussain, N. 2018. Effect of Using Garlic on the Economical and Physiological Characteristics of Broiler Chickens. *Int. J. Environ. Sci. Nat. Res.*, 10(2):1-5.