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Study Effect of Aloe Vera Gel on Lice Parasite of Laying Hens

Dr. Shaimaa A. Shlash and M.SC. Hussein A. Kadhum

Abstract--- *Aimed this study to be evaluated of Aloe vera gel extraction effect on lice parasite in laying hens, were conducted in the duration from March 2019 to August 2019. Use in the now study 40 laying hens, shows positive significant correlation between the number of concentrations 2, 3, 4gm/ ml-1 respectively and number of birds after heal, total healing rate of birds were 52% after the skin was wiped by extraction of Aloe vera gel compared with control group were 0% after three weeks for three times a day. Significant increase showed in the PCV, Hb, RBC and WBC count in third week when the concentration 4 gm/ml-1 compares with control in treated of the birds. As showed significantly reduction in total cholesterol rate ($p<0.05$) in three weeks after treated with gel compared with the control, total protein ($p<0.05$) values showed significantly rise compare with the control and ALP ($P<0.05$) levels showed significant decline in the plasma in the third week when the concentration 4 gm/ml-1 in three weeks after treated compared with the control.*

These results demonstrated that Aloe veragel extract had significant effects on the hematological and biochemical parameters and inhibitory effect against lice parasite in the laying hens.

Keywords--- *Aloe Vera Gel, Lice, Hematological, Biochemical.*

I. INTRODUCTION

Lice is commonly infested with ectoparasites both the mammals and wild or domestic birds cause serious morbidity for being feed on skin debris, feathers, sucking blood which adversely effects on growth and bird manufacturing [(1)], as occur haemogloben reduce, irritation skin and anaemiaat times may lead to death [(2).] These form dangerous in transmit fungal, bacterial and viral pathogens to human and other animals, having many of the structural and behavioral changes helping her to spent life cycle with her hosts [(3).] Several studies explain that lice infested birds in Iraq [(4)] have observed that an aquatic bird is infected with lice in the Dhi-Qar governorate.

*Aloe vera*is a member of *Liliaceous* family characterized by teeth-shaped leaves, widespread use of medicinal plants extracts for controlled as antivenin, antiparasitic and immunological property.Exam used *A.vera* gel for anticoccidial activity inchicks and had varying degrees of results[(5).] Have medicinal properties of *A.vera*include the external healing of various types of wounds, dermatitis and scrapes [(6).] Although there is limited information used in assessingbroiler strain blood profiles observed significant haematological rises [(7).]

*A.vera*have been reported to include mucilaginous gel, barabaloin, vitamins, cinnamic acid, enzymes, polysaccharide, and phenolic used in increased plasma ALT values have been indicated for hepatic harm [(8).] In other studies use *A.vera*gel against *Plasmodium falciparum In vitro*[(9).] As used [(10)] cold water extract of *Nerium oleander*

Dr.Shaimaa A. Shlash, Assistant Prof., Ph.D in Parasitology/Pharmacy College, Kufa University.
E-mail: shaima.shlash@uokufa.edu.iq
M.SC. Hussein A. Kadhum, Assistant Lecturer in Microbiology, Dentistry College, Al-kafeel University.
E-mail: husseinalikadhum@alkafeel.edu.iq

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on the rate of mortality of lice in domestic birds led to parasite killing and health of the infected birds and back hemoglobin ratio to normal values.

The objective of this research is to evaluate the effectiveness of Aloe Vera gel extract on the laying hen lice para site and the impact of this extract on the birds ' physiological status.

II. MATERIALS AND METHODS

Preparation *Aloe vera* Gel Extract: Used in this study fresh leaves were collected from botanical garden agriculture and diagnosed in the Science Faculty/Kufa University then weighed, washed and cut then the gel was separated by scratching with spatula into a clean beaker. The gel was homogenized, filtered through cheese cloth and stored in screw capped jars at 4°C till further use [(11).] 4gm of gel was obtained from this extract, distilled water was added to the gel 100ml to become the stock solution 40mg/ml^{-1} then attended concentrations 10, 20, 30 and 40 mg /kg^{-1} of body weight.

Experimental Birds: Experiment conducted during the period from March 2019 to August 2019 in advanced zoology laboratory of Science Faculty / Kufa University. Used in the current study 40 laying hens (Issa Brown hens) in 6 month age were examined by eye and with use magnifying to check for a louse[(12)]kept in someone cages with water available and fed, divided into four groups:10 birds infected and wipe the skin by distilled water (+ve),10 birds infected and wipe the skin by concentration 2gm/ ml^{-1}, 10 birds infected and wipe the skin by concentration 3gm/ ml^{-1} and 10 birds infected and wipe the skin by concentration 4gm/ ml^{-1} respectively for three time in a day. Where the bird was examined after three weeks to knowledge efficacy of the extract of *A.vera* gel in the loss of lice in body of the bird also examined some of the criteria of blood after treatment [(13).]

Calculate Blood Parameters:5ml of brachial vein blood samples were gathered using experimental syringe containing 10% anticoagulant (EDTA).

Hematological Parameters: From the blood samples the packed cell volume (PCV) was determined by used microhaematocrit method, pull blood by special lattice tubes after the closure of both ends artificial mud then placed in centrifuged at 2000 g for 5 min [(14)], Haemoglobin concentration (Hb) was determined by cyanmethaemoglobin method, mixed 0.02ml blood with HCL diluted HCL diluted in a test tube, then left for five minutes and chromatography was estimated [(15)]. Red blood cells (RBC) and white blood cells (WBC) were counted by using the haemocytometer method [(16).]

Biochemical Parameters: Cholesterol in blood plasma by the methods[(17)], Total protein was determined by kite quipped by (RANDOX) England companies, the samples were read by optical spectroscopy along wavelength 564 nm and alkaline phosphatase (ALP) activity by using kite quipped by (BioMerieux) England companies, the samples were read by optical spectroscopy along a wavelength 510nm depending on[(18).]

Statistical analysis: Data are expressed correlation coefficient between different concentrations of extract and healing rate depending on [(19)] ,the Means ± SD of the number of birds per group, parameters were analyzed using the one way ANOVA and the differences were considered significant at $P<0.05$.

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III. RESULTS

Table 1: Number of heal birds with increased concentrations *Aloe vera*gel in infected birds within Three Weeks.

Groups	No. of birds in each group	First Week	Second Week	Third Week	Healing rate%
Control(+ve) Distill water	10	0	0	0	0
Infected and wipe the skin by 2gm/ ml^{-1}	10	2	3	5	40
Infected and wipe the skin by 3gm/ ml^{-1}	10	3	5	7	60
Infected and wipe the skin by 4gm/ ml^{-1}	10	4	6	9	90
Total	40	9	14	21	52

Table 2: Effect of differ concentrations Aloe veragel in infected birds within First and Third Week on Haematological Parameters

Hematological Parameters	*Aloe vera* gel with concentrations (gm/ ml^{-1})							
	First Week				Third Week			
	Control (+ve)	2	3	4	Control (+ve)	2	3	4
PCV (%)	25.3±7.45	26.7±7.39	29.8±6.31	33±5.21	30.1±6.43	31.5±5.33	33.2±4.20	34±3.29
Hb (g / dl^{-1})	6.2±0.05	8.5±0.07	7.32±0.06	7.5±0.08	7.69±0.04	6.73±0.07	8.78±0.06	9.2±0.08
RBC (10^6/ ml^{-1})	0.65±0.06	0.66±0.05	0.7±0.06	0.68±0.06	0.75±0.07	0.77±0.04	0.81±0.05	0.84±0.07
WBC (10^3/ ml^{-1})	8.3±0.7	10.4±0.83	11.22±0.72	11.44±0.7	10.5±0.82	13.67±1.24	14.23±1.21	14.28±1.11

Table 3: Effect of differ concentrations Aloe veragel in infected birdswithinFirst and Third Week on Biochemical Parameters.

Biochemical Parameters	*Aloe vera*gel with concentrations (gm/ ml^{-1})							
	First Week				Third Week			
	Control (+ve)	2	3	4	Control (+ve)	2	3	4
Cholesterol (mg/dl)	193.42±8.32	150.65±6.11	99.32±5.21	80.33±5.32	194.53±7.35	105.65±6.22	74.11±5.36	53.23±6.33
Total protein (g/dl^{-1})	2.45±0.41	3.31±0.31	3.35±0.25	4.11±0.19	4.36±0.52	3.96±0.39	4.54±0.52	4.62±0.48
ALP (U/I)	115.20±9.13	109.15±8.11	102.13±5.11	88.20±6.12	117.33±9.14	107.30±6.12	99.20±2.12	82.15±4.54

IV. DISCUSSION

Lice is one of the more widespread ectoparasites feeding on feathers and dermal debris and some species feed on blood leads to skin rupture discomfort, feather damage and sleep disruption in acute injury [20]. Showed in the current study that the overall rate of birds healing after wiping skin with *Aloe vera*gel extract were 52% for three times a day, where the highest rates were 90% when concentration 4gm/ ml^{-1} then followed 60% and 40% when

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concentrations 3gm/ ml^{-1} and 2gm/ ml^{-1} comparison to control group were 0% after three weeks of treatment. As in Table 1.

This may be due to active components of *A.vera* including: phenolic, terpenes, lactones, volatile oils, alkaloids act as antimicrobial, antiparasitic, wound heal for skin tissue [21].Gel of *A.vera* used to reduce the burning sensation of burns, blisters, psoriasis and eczema. This study agrees with [22] showed extraction of *A.vera*was able to inhibit effected on the number and viability of the L.promastigote *in vitro*.

This study showed that *A.vera*gel significant differences in PCV, Hb and RBC count in the third week were 34±3.29%, 9.2±0.08 g / dl^{-1} and 0.84±0.07 10^6/ ml^{-1} respectively in concentration the 4 gm/ml^{-1} which causes significantly increase compares with the first week and control group was 30.1±6.43, 7.69±0.04 and0.75±0.07 respectively. As in Table 2

Significant lower may due to feeding the parasite on blood of the host leads to disruption of the bird and loss of appetite anemia causes increase bone marrow to production antibodies to parasite resistance affects in red blood cell's production causing anemia [15] while significant increased ($P<0.05$) due to *A.vera*gel contain phenols, thiamine, folic acid and amino acids in the mucilaginous gel and polysaccharides, consider essential component of the gel stimulate erythropoiesis [23]. Where thiamine can account for hemopoietin assets of the gel because thiamine as such vitamin has been recognized to be responsible for glucose uptake in erythrocytes through of pyruvate dehydrogenase complex formation and thiamine lack causes megaloblastic anemia syndrome [24] Or may due to presence alkaloids compounds act on killing epithelial cells lining the gastrointestinal tract of the parasite affects nerve tissue and causes failure to continue its growth [16]. This study consistent with [25] extract of *A.vera*after infection with *E.tenella* in the fifth week lead to increase the rate of PCV, Hb and RBC.

This study showed significant increased ($P<0.05$) in WBC count were 14.28±1.11 10^3/ ml^{-1} in the third week when the concentration 4 gm/ml^{-1} compared with first week and control group was 10.5±0.82. The reason due to *A.vera*gel contain in composition lectin which act as immune stimulant to produce antibodies [26]. This study agrees with [27]*A.vera* has immune stimulatory properties and property in raise antibodies against coccidial infections. As in Table 2

The current study biochemical showed significantly reduce in the cholesterol ratio when third week were 53.23±6.33 mg/dl in concentration 4 gm/ml^{-1}compares with first week and control group was 194.53±7.35. This reduction may be that phytosterols are one of the primary constituents of A.*vera*gel act to reduce visceral fat accumulation and metabolic conversion of fatty acids, which are mission component of cell membranes where required for both the function and structure of all cell in treatment of leishmaniosis[28]. This study agreed with [29] when used *A.vera*gel led to significant decrease in cholesterol rate which is mission for parasite membrane constitution also binds to cholesterol and forms pores in the cell membrane of the parasite lead to cell death due to increased permeability and the leakage of cellular content.

*A.vera*gel extract in the third week when the concentration 4 gm/ml^{-1} led to significantly increase in total protein were 4.62±0.48 g/dl^{-1}compared with the first week and control group was 4.36±0.52. This attributed to presence

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saponins in theextract have ability to stimulate the production of immune proteins [30]similarity this study [31] that *A.vera* gel composite lead significantly increase in total protein due to protein biosynthesis in born calves.

The results of the alkaline phosphatase (ALP) levels referred to significant decrease and return to the normal rate during duration of treatment with *A.vera*gel extract in the third week when the concentration 4 gm/ml^{-1} was 82.15±4.54 U/I compare with first week and control group was 117.33±9.14. This may due to antioxidant properties of the gel extract e.g flavonoids [32] the hepatoprotective action ascribed to liver enzymes conservation throughout the antioxidant properties of the gel. This agree with [33] that catalase, beta carotene and superoxide dismutase existting in the gel led to reduce hepatic damage induced infections with parasites in wistar rats and changed biochemical certain. As in Table 3

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