

## A NEW REGIMEN FOR TREATMENT OF COCCIDIOSIS IN CHICKENS

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### ABSTRACT

*The present study was adopted to evaluate the efficacy of Garlic, Myrrh and Nigella sativa as anticoccidial agents in the ration of broilers against experimental coccidiosis . The parameters used are clinical signs, mortality, live body weight, weight gain, feed consumption, feed conversion ratio, feed efficiency, oocyst output and caecal lesion scoring . One hundred and twenty five Hubbard chicks of one-day old coccidia free were used in this experiment. Chicks were randomly divided into five groups (25 chicks per group). The groups were separately kept according to the treatment in wire floored. Chickens were given Garlic (*Allium sativum*) at dose level of 5% of the ration.*

*Myrrh (*Commiphora molmol*) at rate of 200 ppm and Nigella sativa 5% of freshly minced seeds were added to the ration. All additives were given continuously for 42 days beginning from the 1st day of age .At the age of 14 days; birds were infected experimentally with 80.000 sporulated oocyst/ bird directly into crop using field strain from *Eimeria tenella*. Faecal samples were examined for oocyst weekly post experimental infection .The obtained results elicited that , all additive obscure the clinical signs, reduced the mortalities ,improved live body weight, weight gain, feed consumption ,feed conversion ratio and feed efficiency as well as decreased shedding of oocyst and reduced caecal lesion scoring as compared with infected untreated group. Garlic was found to be superior in action and responsiveness than Myrrh and Nigella sativa . It could be concluded that theses additives posses an anticoccidial activity and may be valuable for broiler chickens.*

## INTRODUCTION

Avian coccidiosis is a major disease of poultry, which causes serious economic losses to poultry industry. The prolonged uses of chemotherapeutic agents in the control of coccidiosis may lead to the development of drug resistance.

Most chickens and turkeys are given the anticoccidial agents in their feed and millions of dollars are spent every year on medicine. Unfortunately, apart from having a number of side effects, their persistence in tissue and their effects upon the development of immunity to coccidian (*Chapman.,1999*) can't be ignored. The increasing resistance of avian coccidian to anticoccidial drugs currently used in poultry industry has simulated many investigators to found new compounds. Plant therapy is frequently considered to be less toxic with the least side effects than synthetic ones. It has received more attention of possible alternative approaches to coccidiosis control traditional medicinal plants were used by some authors for controlling of coccidiosis (*Allen et al., 1996*).

*Allium sativum*, family Liliaceous (*Tackholm, 1974*) was an important medicine to the ancient Egyptians listed in the medical text Codex Ebers (ca. 1550 BC) specially for the working class involved in heavy labor (*Sanjay and Subir ,2002*) . It is one of the useful medicinal plants that contain 33 sulfur compounds, 17 amino acids (including all of the essential ones), calcium, copper, iron, potassium, magnesium, glutathione, selenium, zinc and vitamins A, B and C. Vitamin C and zinc contribute to the antioxidant and detoxification capacity of Garlic (*Oeleker et al., 1992*). Some of Garlic's constituents possess broad-spectrum antibiotic effects. (*McCann,2003 and Zhou,2003*) Freshly crushed Garlic has been

found to possess antibacterial agent (*Yoshida et al., 1998*), antifungal (*Parsad and Sharma, 1981*) antiviral (*Frolove and Mishenkova, 1970*) and antiparasitic activity including some major human intestinal protozoan parasite such as *Entamoeba histiolytica* and *Giardia lamblia* (*Ankri et al. 1997 and Amagase et al., 2001*).

Myrrh (*Commiphora molmol*, Family Burseraceae) an oleo-gum resin contain 2-8% of volatile oil (Myrrhol) that contain Cadinene dipentene, hecabolene, limonene, pinene, myrcene and alphacamphorene). It also contains terpenes sesquiterpenes, cuminic aldehyde and cugenol (*Chevallier, 1986*). Myrrh contains 40-60% of gum that yields a variety of sugar upon hydrolysis (*Al-Awadi et al., 1991 and Clark 1996*). Commiphora molmol is effective anti-inflammatory, antitumor, antiulcer, antimicrobial, hypoglycemic, antimutagenic and anthelmintic agent (*Massoud et al., 2001; Sheir et al., 2001 and Al-Rawais, 2002*).

*Nigella sativa* seeds (black cumin, black seed, Kaloni and is known in Arabic as Habet El-Baraka) is a herbaceous plant which is a member of family Ranunculaceae. It is a spicy plant and also used as flavoring agent for bakery products (*Hekal and Omar, 1988*). The seeds are widely used for many medicinal purposes. They are carminative and stomachic. The expressed oil had been used for treatment of bronchial asthma (*Ferdous et al., 1993*). Clinical studies on poultry have shown that, the extract of black seeds have an antibacterial (*Morsi, 2000*), as well as anthelmintic effects (*Ferdous et al., 1993 and Mahmoud et al., 2002*). The seeds were effective against cestodes, nematodes (*Akhtar and Rifaat 1991*) and trematodes (*Mahamad and Metwally, 2004*).

Therefore, the purpose of our study was to evaluate the efficacy of Garlic, Myrrh and *Nigella sativa* as anticoccidial agents in the ration of broilers through estimation of growth rate, feed consumption, feed conversion ratio, feed efficiency, oocyst output and caecal lesion scoring parameters indicating the anticoccidial activity.

## MATERIAL AND METHODS

### **A- Experimental chicks:**

One hundred and twenty five Hubbard chicks of one-day-old were obtained from Misr Ismailia Poultry Company. They were reared on battery brooders under standard environmental and hygienic conditions. The temperature was adjusted to 32 °C in the first week of age and decreased by 2 °C every week till reach 26 °C with constant lighting .Chicks were maintained on the experimental diets from one day old to 7 weeks old and allowed free access to food and water at all times.

Chicks were randomly divided into five groups (25 chicks per group). The groups were separately kept according to the treatment in wire floored. Chickens were examined randomly to be assuring that they are coccidia free just before induced infection.

### **B- Experimental rations:**

A commercial ration with balanced nutrimental composition obtained from Ismailia /Misr Poultry Company and free from anticoc-cidial drugs was used.

### **C- The additives:**

- 1- Garlic (*Allium sativum*): Fresh Garlic bulbs obtained from local market were used as a freshly minced at a concentration of 5% of the ration.
- 2- Myrrh (*Commiphora molmol*) at rate of 200 ppm was fed in crude from to one day old chick over a period extended to 7 weeks.
- 3- *Nigella sativa*:5% of freshly minced seeds were added to the ration.

### **D- Eimeria strain:**

Field isolate of *Eimeria tenella* has been maintained in laboratory were used .At age of 14 days, the birds were inoculated directly into crop through mouth by mean of pipette attached syringe with 80000 sporulated oocyst//bird.

## METHODS

### **A- Experimental design:**

The birds were randomly assigned to five equal groups (25 chick of each) according to the feed additives as following:

**Group (I):** non infected untreated birds were kept as negative control (NUT).

**Group (II):** infected untreated birds were used as positive control (IUT).

**Group (III):** the birds were infected and treated with Garlic (IGT).

**Group (IV):** the birds were infected and treated with Myrrh (IMT).

**Group (V):** the birds were infected and treated with Nigella sativa (INT).

### **B- Clinical signs and symptoms:**

The severity of the symptoms was recorded from the 4<sup>th</sup> day post infection onwards.

### **C- Body weight:**

The body weight of all birds was recorded weekly up to 7<sup>th</sup> weeks.

### **D- Feed consumption ,feed efficiency and feed conversion ratio:**

The progressive feed consumption was recorded and the feed conversion ratio was calculated by dividing the gain progressive feed consumption by the weekly body weight gain while feed efficiency was calculated by dividing the weekly body weight gain by the weekly feed consumption.

### **E- Oocyst output per gram of faeces:**

The oocyst output per gram of faeces was determined weekly according to modified (*Mc Master,1977*) method.

### **F- Lesion scoring:**

Five birds from each group were scarified weekly for lesion scoring according to (*Johnson and Ried, 1970*).

### **G- Statistical analysis:**

The obtained data were statistically analyzed using the (*Snedcor and cochran,1982*). Means were compared by least significance difference (LSD) test at 0.05 significant level (*Steel and Torrie, 1980*).

## **THE RESULTS**

### **The clinical signs and symptoms:**

All infected groups showed typical clinical signs of coccidiosis on the 4<sup>th</sup> day post infection .They were low feed and water intake, huddling ruffled feather and blood tinged fecal droppings. The IUT birds group showed bloody watery diarrhea on the 5<sup>th</sup> days and 6<sup>th</sup> day post infection. The severity of signs was reduced in all infected and treated groups than infected untreated ones

### **Body weight:**

Data recorded in table (1) revealed that ,addition of Garlic , Myrrh and Nigella sativa to the basal diet feed to coccidia infected birds produce a significant increase ( $P<0.01$ ) in average body weight as compared with IUT group throughout the entire experimental period .These effects were found to be greater in response to Garlic than to Nigella sativa and Myrrh.

### **Body weight gain:**

It has been established that ,addition of Garlic , Nigella sativa and Myrrh to the basal diet of coccidia infected birds induced a significant increase ( $P<0.01$ ) in body weight gain as compared to IUT birds

throughout the whole experiment .These effects were found to be superior in response to Garlic than Nigella sativa and Myrrh. Moreover, the IGT group significantly increases than NUT one. Also there were non significant changes between INT, IMT and NUT groups during the 3<sup>rd</sup> week as well as non significant changes between INT and IMT groups during 4<sup>th</sup> and 5<sup>th</sup> weeks (Table 1).

### **Feed consumption:**

The data recorded in table (1) indicated that, addition of Garlic, Myrrh and Nigella sativa to the basal diet fed to coccidian infected birds, showed an improvement in their feed consumption rates as compared to IUT group. These effects were found to be higher in response to Garlic than Nigella sativa than to Myrrh. The NUT group possessed the greatest value at allover the entire experiment.

### **Feed conversion rate:**

As shown in table (2), it has been demonstrated that, addition of Garlic, Myrrh and Nigella sativa significantly improve the feed conversion rates as compared to IUT group. This effect was found to be greater in response to Garlic than to Nigella sativa than to Myrrh. The IUT birds provoked the worst value throughout the experimental period . Meanwhile the NUT group revealed significantly better feed conversion rate than any other groups throughout the whole experiment except at the 3<sup>rd</sup> week. Where all infected treated groups were the best. There were non significant changes between the NUT groups and all infected treated groups during the 4<sup>th</sup> and 5<sup>th</sup> weeks.

### **Feed efficiency:**

As recorded in table (2), it has been shown that Garlic and Nigella sativa treatments significantly improved the feed efficiency of coccidia

infected birds as compared to IUT ones. The NUT birds having the highest feed efficiency throughout the entire experiment except at the 3<sup>rd</sup> and 5<sup>th</sup> weeks where the IGT birds possessing the highest values.

### **Oocyst output:**

The administration of Garlic ,Myrrh and Nigella sativa to coccidia infected birds significantly reduced the shedding of the oocyst as compared to IUT group as recorded in table (3).this effects was found to be greater in response to Garlic than to Nigella sativa and myrrh treatments.

### **Caecal lesion score:**

The results recorded in table (3) indicated that, the highest lesion score was observed in IUT birds throughout the whole experimental period. The addition of Garlic, Myrrh and Nigella sativa significantly reduced the lesion scores. The lesion score disappeared completely in IGT birds at the 3<sup>rd</sup> week .While, in INT and IMT groups, the lesion scores disappeared at the 4<sup>th</sup> week post coccidial infection.

### **Over all mortality:**

As shown in table (3)it has been demonstrated that ,Garlic ,Myrrh and Nigella sativa treatment significantly reduced the mortality percentage from 24% in IUT group to 4% in both IGT and INT groups and 8% in IMT one.





**Table (1):** The effect of Garlic, Myrrh and *Nigella sativa* treatment on body weight, body weight gain and feed consumption in birds experimentally infected with *E.tenella*.

group	1 <sup>st</sup> week			2 <sup>nd</sup> week			3 <sup>rd</sup> week			4 <sup>th</sup> week		
	Body weight	Body weight gain	Feed consumption rate	Body weight	Body weight gain	Feed consumption rate	Body weight	Body weight gain	Feed consumption rate	Body weight	Body weight gain	Feed consumption rate
Group (I) (NUT)	438.5 <sup>a</sup> ± 9.1	219.04 <sup>a</sup> ± 9.08	76 <sup>a</sup> ± 0.81	815.4 <sup>a</sup> ± 3.95	366.21 <sup>a</sup> ± 10.19	110.06 <sup>a</sup> ± 0.597	979.47 <sup>b</sup> ± 12.62	168.53 <sup>a</sup> ± 14.4	128.53 <sup>a</sup> ± 4.46	1143.9 <sup>a</sup> ± 4.46	182.6 <sup>a</sup> ± 17.14	159.58 <sup>a</sup> ± 0.838
Group (II) (IUT)	330.41 <sup>e</sup> ± 2.28	111.41 <sup>e</sup> ± 2.28	60.22 <sup>d</sup> ± 1.99	467.25 <sup>e</sup> ± 8.59	137.46 <sup>e</sup> 8.58	90.48 <sup>e</sup> ± 1.09	574 <sup>e</sup> ± 8.18	112.87 <sup>e</sup> ± 14.36	113.51 <sup>e</sup> ± 0.773	665 <sup>e</sup> ± 10.97	82.6 <sup>e</sup> ± 11.07	126.81 <sup>e</sup> ± 0.932
Group (III) (IGT)	406.27 <sup>b</sup> ± 4.43	186.78 <sup>b</sup> ± 4.43	68.43 <sup>b</sup> ± 0.473	668.35 <sup>b</sup> ± 4.67	319.36 <sup>b</sup> ± 7.81	103.46 <sup>b</sup> ± 0.509	848 <sup>b</sup> ± 6.38	180.2 <sup>a</sup> ± 9.76	125.62 <sup>b</sup> ± 0.774	1016.8 <sup>b</sup> ± 9.96	166.6 <sup>b</sup> ± 11.22	154.17 <sup>b</sup> ± 1.02
Group (IV) (IMT)	340.13 <sup>d</sup> ± 2.18	120.38 <sup>d</sup> ± 2.22	60.8 <sup>d</sup> ± 1.1	551.9 <sup>d</sup> ± 6.58	210.85 <sup>d</sup> ± 7.93	93.51 <sup>d</sup> ± 0.574	716 <sup>d</sup> ± 6.03	162.47 <sup>bcd</sup> ± 10.09	120.79 <sup>d</sup> ± 0.753	863.5 <sup>d</sup> ± 6.58	147.9 <sup>cd</sup> ± 4.85	142.15 <sup>d</sup> ± 0.663
Group (V) (INT)	372.44 <sup>c</sup> ± 3.46	152.94 <sup>c</sup> ± 3.46	64.07 <sup>c</sup> ± 0.371	596.9 <sup>c</sup> ± 5.13	220.35 <sup>c</sup> ± 7.07	96.7 <sup>c</sup> ± 0.714	760.7 <sup>c</sup> ± 4.20	164.33 <sup>bc</sup> ± 7.87	123.62 <sup>c</sup> ± 0.452	918 <sup>c</sup> ± 5.54	158.5 <sup>bc</sup> ± 7.92	147.61 <sup>c</sup> ± 1.14

Mean bearing different letters superscripts, differ significantly (P<0.05).



**Table (2):** The effect of Garlic, Myrrh and *Nigella sativa* treatment on feed conversion rate and feed efficiency in birds experimentally infected with *E.tenella*.

groups	1 <sup>st</sup> week		2 <sup>nd</sup> week		3 <sup>rd</sup> week		4 <sup>th</sup> week		5 <sup>th</sup> week	
	Feed conversion rate	Feed efficiency	Feed conversion rate	Feed efficiency	Feed conversion rate	Feed efficiency	Feed conversion rate	Feed efficiency	Feed conversion rate	Feed efficiency
Group (I) (NUT)	2.54 <sup>a</sup> ± 0.107	0.412 <sup>a</sup> ± 0.017	2.16 <sup>a</sup> ± 0.057	0.468 <sup>a</sup> ± 0.013	6.43 <sup>d</sup> ± 0.956	0.187 <sup>bcd</sup> ± 0.016	6.6 <sup>a</sup> ± 0.84	0.164 <sup>a</sup> ± 0.016	7.81 <sup>a</sup> ± 0.592	0.132 <sup>b</sup> ± 0.009
Group (II) (IUT)	3.84 <sup>e</sup> ± 0.087	0.262 <sup>e</sup> ± 0.005	5.09 <sup>e</sup> ± 0.424	0.217 <sup>e</sup> ± 0.001	10.12 <sup>e</sup> ± 2.08	0.142 <sup>e</sup> ± 0.018	15.24 <sup>b</sup> ± 3.81	0.093 <sup>e</sup> ± 0.013	10.47 <sup>b</sup> ± 2.98	0.076 <sup>e</sup> ± 0.018
Group (III) (IGT)	2.6 <sup>b</sup> ± 0.066	0.390 <sup>b</sup> ± 0.009	2.3 <sup>b</sup> ± 0.075	0.441 <sup>b</sup> ± 0.011	5.12 <sup>a</sup> ± 0.316	0/205 <sup>a</sup> ± 0.011	6.75 <sup>a</sup> ± 0.453	0.154 <sup>b</sup> ± 0.01	7.44 <sup>a</sup> ± 0.681	0.156 <sup>a</sup> ± 0.01
Group (IV) (IMT)	3.56 <sup>d</sup> ± 0.065	0.283 <sup>d</sup> ± 0.005	3.21 <sup>cd</sup> ± 0.158	0.322 <sup>cd</sup> ± 0.012	5.45 <sup>a</sup> ± 0.301	0.192 <sup>bc</sup> ± 0.012	6.80 <sup>a</sup> ± 0.230	0.149 <sup>bcd</sup> ± 0.005	8.12 <sup>a</sup> ± 0.793	0.127 <sup>c</sup> ± 0.01
Group (V) (INT)	2.97 <sup>c</sup> ± 0.075	0.339 <sup>c</sup> ± 0.008	3.15 <sup>c</sup> ± 0.121	0.325 <sup>c</sup> ± 5.51	5.54 <sup>a</sup> ± 0.283	0.193 <sup>b</sup> ± 0.008	6.68 <sup>a</sup> ± 0.359	0.152 <sup>bc</sup> ± 0.008	8.51 <sup>a</sup> ± 0.819	0.122 <sup>cd</sup> ± 0.01

Mean bearing different letters superscripts, differ significantly (P<0.05).

**Table (3):** The effect of Garlic, Myrrh and *Nigella sativa* treatment on oocyst output ,caecal lesion score and over all mortality rate % in birds experimentally infected with *E.tenella*.

group	1 <sup>st</sup> week		2 <sup>nd</sup> week		3 <sup>rd</sup> week		4 <sup>th</sup> week		5 <sup>th</sup> week		Over all mortality %	
	Oocyst output	Lesion score	Oocyst output	Lesion score	Oocyst output	Lesion score	Oocyst output	Lesion score	Oocyst output	Lesion score	No.	%
Group (I) (NUT)	0.0±0.0 <sup>e</sup>	0.0±0.0 <sup>e</sup>	0.0±0.0 <sup>e</sup>	0.0±0.0 <sup>e</sup>	0.0±0.0 <sup>c</sup>	0.0±0.0 <sup>d</sup>	0.0±0.0 <sup>b</sup>	0.0±0.0 <sup>b</sup>	0.0±0.0 <sup>b</sup>	0.0±0.0 <sup>b</sup>	0.0	0.0
Group (II) (IUT)	365254.6 <sup>a</sup> ±1105.75	3.8 <sup>a</sup> ± 0.2	254348.8 <sup>a</sup> ± 5543	4.3 <sup>a</sup> ± 3.7	98049 <sup>a</sup> ± 2282.83	2.6 <sup>a</sup> ± 0.59	70206 <sup>a</sup> ±1218.16	1.6 <sup>a</sup> ±0.4	39447 <sup>a</sup> ± 1660.5	1.4 ±0.6	6	24
Group (III) (IGT)	56560 <sup>d</sup> ±2229.19	1.8 <sup>d</sup> ±0.37	15537 <sup>d</sup> ± 662.09	0.6 <sup>d</sup> ±0.25	0.0 ±0.0 <sup>c</sup>	0.0 <sup>b</sup> ±0.0	0.0 <sup>b</sup> ± 0.0	0.0 <sup>b</sup> ± 0.0	0.0 <sup>b</sup> ± 0.0	0.0 ±0.0	1	4
Group (IV) (IMT)	152119.6 <sup>b</sup>	3.0 <sup>b</sup> ±0.51	55162.8 <sup>b</sup> ± 4005.46	2.6 <sup>b</sup> ± 0.51	28766.8 <sup>b</sup> ±1715.65	0.2 <sup>b</sup> ±.32	0.0 <sup>b</sup> ± 0.0	0.0 <sup>b</sup> ± 0.0	0.0 <sup>b</sup> ± 0.0	0.0 <sup>b</sup> ± 0.0	2	8
Group (V) (INT)	80985.2 <sup>c</sup> ±2730.36	2.4 <sup>c</sup> ±0.51	31284.2 <sup>c</sup> ± 989.89	1.8 <sup>c</sup> ± 0.51	0.0±0.0	0.8 <sup>c</sup> ±0.24	0.0 <sup>b</sup> ± 0.0	0.0 <sup>b</sup> ± 0.0	0.0 <sup>b</sup> ± 0.0	0.0 ± 0.0	1	4

Mean bearing different letters superscripts, differ significantly (P<0.05)

## DISCUSSION

Coccidiosis in chicken is produced by ten *Eimeria* species of which *Eimeria tenella* causes heavy mortality in early age produce severe economic losses. For control such disease many chemotherapeutic agents are used extensively. However, they have several constraints (*Gill and Bsjwa, 1999*). Hence; search is one for substitute as indigenous medicinal plants. Moreover, the increasing resistance of avian coccidia to anticoccidial drugs currently used by the poultry industry has stimulated the search for new methods of control. The initial hope underlying this study was to find a natural product with minimal processing.

As floor pen trials can provide an acceptable complete protection and provide useful information under simulated practical condition (*Cover, 1970*) and are widely accepted as an essential link between laboratory and practice (*James, 1978*). A semi field (Floor- pen) trial to evaluate the efficacy of Garlic, Myrrh and *Nigella sativa* as anticoccidial agents in the ration of broilers was adopted. In the present study all infected groups showed clinical signs of coccidiosis on the 4<sup>th</sup> day post infection. They were low feed and water intake, huddling ruffled feather and blood tinged fecal droppings. The IUT birds group showed bloody watery diarrhea on the 5<sup>th</sup> days and 6<sup>th</sup> day post infection. The severity of signs was reduced in all infected and treated groups than infected untreated ones. Nearly, the same signs during coccidiosis were recorded by *Ghadage (2000)*; *Jaipukar et al. (2002)* and *Awaad et al. (2003)*. The obtained results indicate that, the mortality reached 24% in IUT chicken group. *Clarck et al. (1978)* reported that direct oral infection with oocyst caused heavy infections which resulted in mortalities up to 78% in untreated control birds. The addition of Garlic or Myrrh or *Nigella sativa* to the basal diet fed to infected birds reduced the mortality to 4% in both

(IGT and INT) and to 8% in IMT chicken groups with decreased lesion score in all gut sites. As well as, it reduced oocyst output in feces and improve weight gain, feed consumption, feed conversion and feed efficiency in comparison with IUT birds group .These effects were found to be superior in IGT group than in INT and IMT groups. **Reid (1978)** reported that lesion scoring is recognized as one of the most sensitive criteria for monitoring degree of coccidiosis control in laboratory (cage) testing floor pens and field trials. There was a good correlation between oocyst output mortality rate, data and lesion scores of experimental groups. Lesion scores have been considered in conjunction with flock performance data in order to accurately assess control efforts. In this study, great correlation in results was obtained between the performance data (mean body weight gain, weight gain, feed consumption, feed conversion ratio, feed efficiency) and lesion scoring. **Eckman (1993)** and **Befundo (1994)** stated that, the flock performance is more meaningful and accurate parameter for gauging the efficacy of coccidial control programs besides the past evaluation of anticoccidial agents that focused primarily on simple comparisons lesion reduction. The improvement in infected treated birds performance together with reduction in lesion scores, shedding of oocyst output and morality strongly suggest that, diet supplementation with Garlic, Myrrh and Nigella sativa provided a significant protection against *Eimeria tenella* infection. Unfortunately little or even nil is known about the anticoccidial effect of such additives in the glow of the obtained results,one could view such protection to the presence of components that offer activity against coccidia. Needless to say our suggestion clearly reinforced by previous research studies divulged that Garlic oils proofed to be useful as chemotherapeutic agents against several poultry parasites (**Zenner et al.,2003**).Also,Garlic extract or its major components proved effective against various protozoan including several species of trypanosomes (**Noke et al; 1996**), leishmania

(*McClure et al., 1996*) and plasmodium (*Perez et al., 1994*). As well as Entamoeba histolytica (*Ankri et al., 1997*), Giardia lamblia (*Harris et al., 2000*) and Cryptosporidium oocyst in calves (*Olsen et al., 1998*) Cryptosporidium baily oocyst output in birds (*Tomas et al., 1999*). The antibacterial activity of Garlic (*Ankri and Mirelman, 1999*), the immune stimulant, antimicrobial (*Brander et al., 1982*), the antioxidant (*Ghandour, 2006*), antihistaminic (*Charkravarty, 1993*), the anti-ulcer (*El-Dakhkhny et al.; 2000 a*) and anti-inflammatory (*Al-Ghamdi, 2001*) activities of Nigella sativa as well as the antibacterial and antiulcer activities of Myrrh (*Bon-elli and Izzo, 2000 and Dolra et al; 2000*) may reduce mortalities by coccidiosis. Additionally Myrrh provides vitality and strength to the digestive system. It stimulates flow of the blood to capillaries and helps the speed healing the mucus membrane including the intestine and also it aids digestion (*Tenny, 2000*). Nigella sativa seed rich in nutritional values and contains over 100 valuable components. It riches with essential fatty acids and proteins which are essential for growth specially in case of coccidial infection (*Hein, 1971*). Nigella sativa seed riches in carbohydrates specially monosaccharide and non starch polysaccharides component which are useful source of dietary fiber. It also contains various vitamins and minerals which provides vitality and strength to the digestive system (*Brander et al., 1982 and McKee&McKee 1999*). These findings may also explain the improvement in the body weight and reduction in lesion score and mortalities. Garlic could be used as growth promoter in broilers (*Day and Somanto, 1993*). In the same context, *Khashaba et al. (2001)* showed that feeding quail chick diet supplemented with Garlic powder or extract, increased each of body weight, feed consumption and improved feed gain ratio and economic efficiency. *Recently Massoud et al. (2004)* recorded that, crude Myrrh fed to coccidia infected chickens for a period of 7 weeks, significantly improved body weight in comparison with infected non



treated groups. Myrrh also reversed the body weight, improve the feed conversion, reduced the shedding of oocyst and lesion scores due to *Eimeria tenella* infection.

*Nadia (2005)* elicited that *Nigella sativa* either alone or in combination with diclazuril fed to chickens for a period of 6 weeks, significantly improved their body weight and weight gain as well as reduce oocyst shedding, lesion scoring and mortalities as compared with infected non treated group.

In conclusion, it was evident that Garlic, Myrrh and *Nigella sativa* possess anticoccidial activity , this activity was found to be superior with Garlic. So, these additives are valuable for broiler chickens.

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طرق جديدة لعلاج الكوكسيديا في الدواجن

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## معهد بحوث صحة الحيوان -الإسماعيلية

أجريت هذه الدراسة لتقييم كفاءة الثوم و نبات المرّ و حبة البركة كمضادات للإصابة بالكوكسيديا كإضافات للأعلاف فى بدارى التسمين وهذا التقييم تم من خلال الأعراض الظاهرية ، معدل النفوق، وزنّ الجسم الحى، زيادة الوزن، استهلاك العلف ، نسبة تحويل الغذاء، كفاءة الغذاء ، و معدل إخراج حويصلات الكوكسيديا فى البراز بالإضافة إلى التغيرات المحدثة فى القولون وذلك للكتاكت المصابة اصطناعيا بالكوكسيديا. وقد تم إجراء التجربة على عدد مائة و خمسة وعشرون كتكوت عمر يوم من نوع الهبرد خالية من الكوكسيديا فُسِّمَتْ بشكل عشوائي إلى خمس مجموعاتٍ متساوية (25 كتكوت لكل مجموعة). المجموعة الأولى أعطيت ثومَ فى مستوى جرعة 5 % ، المجموعة الثانية أعطيت نبات المر بمعدل 200 جزء فى المليون و المجموعة الثالثة أعطيت حبة البركة بمعدل 5 % . وقد أعطيت كُـلَّ الإضافات بشكل متصل من اليوم الأول حتى عمر 42 يوم. وعند اليوم الرابع عشر من العمر تم إجراء عدوى اصطناعية بحويصلات الكوكسيديا بمعدل 8000 حويصلة لكل طائر . وأظهرت النتائج أن الإضافات جميعها بصفة عامة قد حسنت من زيادة معدل وزنّ الجسم الحى وتقليل فى استهلاك العلف ورفع كفاءة تحويل الغذاء بالإضافة إلى تقليل نسب النفوق و معدل إخراج حويصلات الكوكسيديا فى البراز و التغيرات الباثولوجية الظاهرية المصاحبة فى القولون وذلك بالمقارنة بالمجموعة المصابة وغير معالجة. وقد اظهر استعمال الثوم تفوقا معنويا ملحوظا فى هذه المعدلات وذلك عن كل من نبات المر و حبة البركة ويمكن من خلال الدراسة استنتاج ان إضافات الأعلاف من الثوم أو حبة البركة أو نبات المر ذات مردود ايجابي ومفيد كمضاد للكوكسيديا وذلك لاستخدامها فى علائق الدجاج.