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COMARATIVE EFFICACY OF SOME ANTI-COCCIDIAL AGENTS FOR THE CONTROL OF NATURAL COCCIDIOSIS IN TWO STRAINS OF JAPANESE QUAIL

BY

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INTRODUCTION

Japanese quail (C. coturnix japanica) are valuable birds for meat and egg production. Since, there are limited numbers of intensive quail-breeding farms in Egypt, then they sterted to increase remarkabl because of the growing market demands of quail.

Coccidiosis exhibited one of the most common disease of quail. It reduces weight gain, production and fertility (Ruff et al., 1984). In case of coccidial outbreaks in quail farms in Egypt, the therapeutic method adopted for chicken coccidiosis were employed. Breed differences and genetic factors play a part in the resistance of chicken to coccidiosis (Long, 1968).

The aim of the present work was to study the pathogenicity of natural coccidiosis on two strains of Japanese quail kept on batteries as well as their control using 4 anticoccidial agents and comparative study on their efficacy.

MATERIAL AND METHODS

This work was conducted at the Faculty of Veterinary Medicine, Alexandria University, where the quail were raised at the farm of Animal Husbandry Department. 3000 Japanese quails (brown and white strains) of a sex ratio one male to two females were used. Quail were floor brooded till the first eggs then moved to stair step laying cages as one male and two females were kept in a seperate pen. This was at first half of the year 1991. The birds were fed a commerical laying ration for quail (24% protein) mixed at the faculty of Agriculture, Alexandria University, and it was free from anticoccidial agents as has been ordered.

It was noticed that quail that suffering from loss of weight and drop of egg produciton as well as some mortality were recorded. Birds were examined and found to be suffering from coccidiosis. After moving to the wire-floored laying batteries, quail were alloted to 5 groups, each of them had 4 replicates of 15 birds for replicate (5 males and 10 females). All birds were wing-banded and individually weighted on the first day of treatment (D) with anticoccidials and reweighed at the 7th day (D + 7) post treatment and at the 14th day (D + 14).

Experimental birds were fed the same commercial laying ration of quail mixed manually with each of the respective anticoccidial drugs under investigation from (D) to (D + 14) with the doses shown in **Table 2.** Litter and faecal specimens as well as the intestinal and caecal scrapings of the freshly dead quail were investigated for Eimeria infection.

Identification of *Eimeria sp.* was achived by oocyst shapes, site of infection and histopathological examiantions according to Pellerdy (1974) and Otify (1988).

Parameters used for evaluation of the drug efficacy covered economical traits including mortality rate, weight gains and egg production rate. In addition, parasitological parameters were considered including daily oocyst output count before and during days of treatment (Shakshouk, 1989). Statistical analysis was done according to Duncan (1955).

RESULTS AND DISCUSSION

Microscopical examination of litter, faecal specimens and intestinal and caecal scrapings of the freshly dead quail revealed that the quail under investigation were naturally infected with two species of Eimeria organisms: *E. uzura* (Fig. 1)and *E. bahli* Fig. 2).

The characteristic features of unsporulated and sporulated oocysts as well as site of infection and histopathological examination (Fig. 3, 4) were similar to that obtained by Tsunds and Muraki (1971), Pellerdy (1974) and Otify (1988).

Prelimanary analysis show that there was no significant ($p < 0.05$) influence of quail strains and sex on mortality percent and oocyst counts. So, the data were added in (Table 1, 2).White and brown Japanese quail did not differ significatly ($p < 0.05$) in egg production before, during or after the same treatment, except white quail had significantly higher egg production than brown quail during first week of medication with 75 ppm Lasalocid (Table 3).

It was found clearly that coccidial infection in quail reduced body weight and egg production (Table 1, 2). Anticoccidial drugs under test improved weight gains of naturally infected quail with Eimeria organism (7. 48 VS. 14.24 gm) when

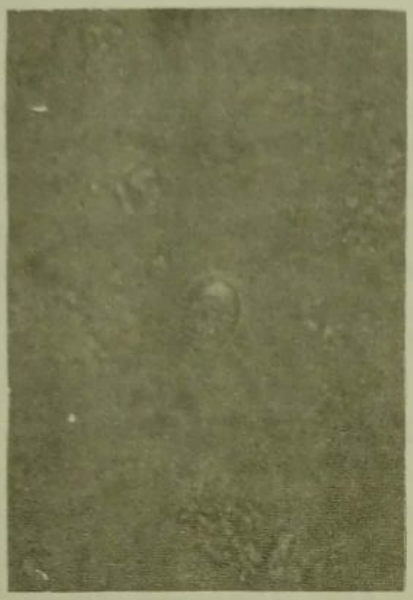

Fig.(1):Unsporulated oocyst of E.uzura investigated in caecal quail(X40).

Fig.(2):Unsporulated oocyst of E.bahli,investigated in caecal quail (X 40).

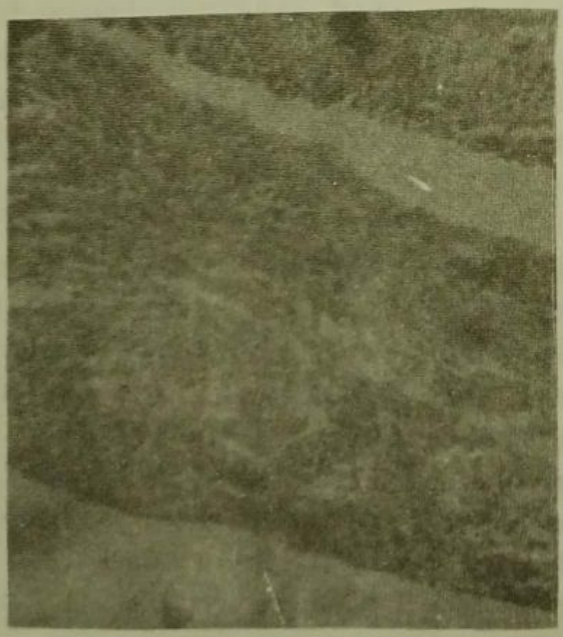

Fig.(3): C.S in caecum showing schizonts of Eimeria spp. of quail (H,E.,X 16) .

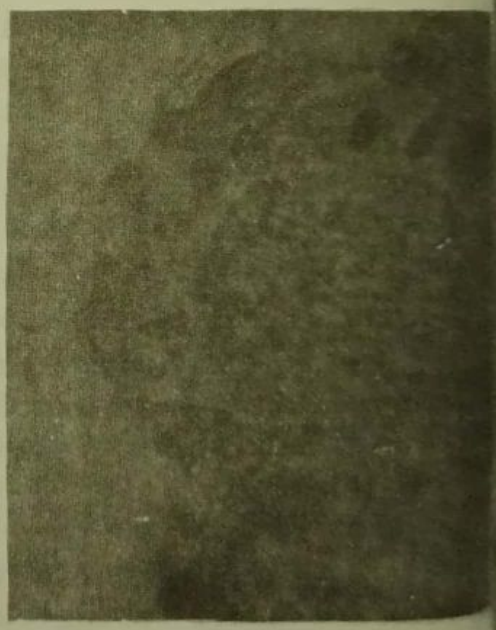

Fig.(4):C.S. in caecum showing developmental stages of Eimeria spp. of quail (H,E. , X 25) .

(Table (1): Effect of some anticoccidial agents on body weight (B.Wt.) and weight gains (Wt.g.)/gm. during natural infection of Japanese quails with coccidiosis .

(1) Group No.	Drugs	(2) B.Wt at (D)	B.Wt.at (D+7)	B.Wt. at (D+14)	Wt.g. from D to D+7	Wt.g. from D+7 to D+14
I	No	169.33+34.26	172.47+36.75	181.40+32.25	3.14	8.93
		152.80+14.82	160.00+16.63	177.13+17.10	7.20	17.13
		172.07+14.94	180.13+21.86	186.60+26.93	8.06	00.47
		169.27+15.45	180.80+22.50	187.40+22.97	11.53	6.60
	$\bar{X}$ ..	165.87+ 8.81	173.35+ 9.67	180.88+ 6.28	7.48^{c} (3)	7.03^{b}
II	Lasalocid (70 ppm)	167.13+15.41	179.00+19.65	188.27+23.43	11.87	9.27
		177.47+19.16	189.00+19.52	198.64+21.38	11.53	9.64
		167.20+17.70	166.27+26.67	177.79+23.76	00.93	11.52
		162.53+15.85	170.36+18.01	180.43+21.04	7.83	10.07
	$\bar{X}$..	168.59+ 6.32	176.16+10.07	186.28+ 9.36	9.58^{b}	10.12^{a}
III	Robendine (33 ppm)	168.58+25.27	176.36+30.55	186.43+31.56	7.78	10.07
		161.13+21.02	172.27+21.65	181.20+22.54	11.14	8.93
		171.00+21.15	179.47+27.14	187.29+23.72	8.47	7.82
		169.49+18.44	178.13+20.74	189.93+23.10	8.64	11.80
	$\bar{X}$..	167.50+04.40	176.56+03.13	187.57+08.04	9.00^{b}	11.01^{a}
IV	Salinomycin (60 ppm)	166.33+19.16	178.20+26.37	186.60+30.56	11.87	8.40
		174.67+13.43	189.67+18.05	195.80+20.64	15.00	6.13
		167.93+12.74	175.80+16.21	192.14+16.36	8.87	16.34
		167.80+23.85	176.80+22.77	187.73+19.69	9.00	10.93
	$\bar{X}$..	169.18+03.73	180.12+ 6.44	190.56+ 4.22	11.19^{a}	10.45^{a}
V	S.Q. (0.04 %)	172.47+28.10	182.40+28.30	188.27+31.66	9.93	6.87
		170.33+26.68	184.47+23.84	192.33+21.17	14.14	7.86
		169.20+24.75	181.60+29.93	197.93+30.57	12.40	16.33
		173.53+21.69	194.00+26.73	202.14+25.75	20.47	4.14
	$\bar{X}$..	171.38+ 1.97	185.62+ 5.72	195.17+ 4.74	14.24^{a}	9.80^{a}

1- Five groups, 4 replicates / group and 15 birds / replicate .

2- D = Day of addition of anticoccidial agents .

3- Groups of different letters in the same columon show significant different at $P < 0.05$

Table (2): Effect of anticoccidial agents on oocystic counts and mortality percentages during a natural infection of Japanese quails with coccidiosis .

Group No.	Medication	Oocystic counts per gram of faeces in 10^4 at the days of medications .												Total Oocystic counts	Mortality %
		1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th	11th	12th		
I	No drugs	14.5	32	45	33	25	18	10	6.3	4.2	2.4	0.6	0.4	189.4 ^{a*}	8.33 ^{a}
II	Lasalocid (70 ppm)	12.5	27	17	11	7	5	3	2.5	0.6	0.0	0.0	0.0	85.8 ^{b}	5.00 ^{b}
III	Robenidine (33 ppm)	17.0	29	15	9	6	1	2	2.0	0.4	0.0	0.0	0.0	84.4 ^{b}	3.33 ^{b}
IV	Salanomycine (60 ppm)	17.0	23	13	10	8	5	4	2.0	0.2	0.0	0.0	0.0	82.2 ^{b}	1.70 ^{c}
V	S.Q. (0.01 %)	16.5	28	10	6	4	2	1	0.4	0.0	0.0	0.0	0.0	67.9 ^{c}	1.70 ^{c}

* = Different letters in the same coloumn show significant differences at $P < 0.05$.

Table (2): Effect of some anticoccidial agents on egg production of the pen (egg) during natural infection of coccidiosis in two strains of Japanese quails (White and Brown).

Group No.	Medication	Breeds	One week before medication	During medications		One week after medication
				1st week	2nd week	
I	No drugs	White	8.3±1.25[a] *	6.1±1.52[a]	4.7±0.82[b]	6.0±0.82[b]
		Brown	8.1±2.23[a]	5.2±0.92[a]	4.8±2.00[b]	6.8±1.75[b]
II	Lasalocid (70 ppm)	White	8.1±1.20[a]	5.3±0.67[a]	7.0±1.63[a]	9.6±1.90[a]
		Brown	7.8±2.15[a]	3.8±1.19[b]	6.0±2.00[a]	9.4±1.17[a]
III	Robendine (33 ppm)	White	9.1±1.97[a]	6.6±1.58[a]	6.9±2.47[a]	9.0±1.30[a]
		Brown	8.2±2.90[a]	5.9±2.30[a]	6.4±2.50[a]	9.7±1.64[a]
IV	Salanomycine (60 ppm)	White	6.6±1.58[a]	5.0±1.33[a]	7.5±2.01[a]	9.9±1.50[a]
		Brown	8.1±1.97[a]	6.4±1.50[a]	7.8±2.10[a]	9.5±1.78[a]
V	S.Q. (0.04 %)	White	7.1±2.56[a]	5.1±1.60[a]	8.6±2.59[a]	10.0±0.94[a]
		Brown	7.7±1.39[a]	6.5±1.90[a]	7.7±2.54[a]	9.2±1.78[a]

* = Members of different letters in the same group show significant difference ($P < 0.05$).

compared with infected non-medicated birds (Table). Data in Tables 2,3 show that all anticoccidial agents used through this work reduced significantly ($p < 0.05$) oocyst output and mortality rates (1.7 VS. 8.33%) and also improved egg production (4.7 VS. 8.6 egg) when compared with infected non-medicated birds.

Under these circumstancess and according to judgement paramters used, we might arrange the anticoccidials unde test according to their efficacy against natural infection of coccidiosis in quail as follow ; Sulphaquinoxaline, Salinomycin, Robendine and Lasalocid. On the other hand, Long (1987) found that the later 3 drugs have more effect on chicken coccidiosis than the first one (Sulphaquinoxaline). The lower action of Sulphaquinoxaline on chicken coccidiosis of both floor and battary reared chicken may be due to drug resistance phenomena (Shakshouk, 1984 and 1989). On contrary Sulphaquinoxaline had the superior effect on quial coccidiosis through this study, this may be due to fail of drug resistance of quial Eimeria to Sulphaquinoxaline.

It is intersting to mention that the relationship of coccidiosis with body weight gain, egg production, breed and sex and the sensitivity to different anticoccidial drugs in japanse quails is considered the first studies on this subject in Egypt.

SUMMARY

Three hundred brown and white Japanese quail (16 weeks old) were used to study the efficacy of some anticoccidial agents against natural infection of quail coccidiosis as well as the breed difference in susceptibility and response to medication. Identification of Eimeria species was done, *E. uzura* and *E. bahli* oocysts were investigated during examination of litter, faecal specimens as well as caecal scrapings of the freshly dead quail.

Natural quail coccidiosis in this case lead to 8.33% mortality and 4.7% drop in egg production as well as loss of weight gains (7%). Under the conditions of the present work and according to the parameters used for judgement, the stated drugs could be arranged in the order of their efficacy on natural infection of the investigated birds with Eimeria organisms as follow: Sulphaquinoxaline (S Q), Salinomycine, Robendine and Lasalocid. Quail strains and sex had no significant influence ($p < 0.05$) on mortality percentage or oocyst counts of Eimeria.

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