
SURVEY ON PARASITIC DISEASES OF RABBITS IN ISMAILIA PROVINCE. ←

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ABSTRACT

The present study was carried out for studying the parasitic diseases affecting rabbits where two hundred and sixty rabbits of different breeds, age and in different seasons, which were randomly collected from different localities in Ismailia Province during one year (2001 – 2002). The results were summarized. The clinical examination revealed that, the diseased rabbits showed off food, emaciation, diarrhoea, dehydration, salivation, paralysis of legs, tympani and loss of fur and scales on the fur less skin. The postmortem examination revealed enlarged and cirrhotic liver with greyish – white spots. The intestinal content was mixed with blood and mucus, with congested, swollen and haemorrhagic intestinal wall. The examined cases affected with parasitic diseases, in this study, showed Five types of intestinal coccidiosis (37.4%) and hepatic coccidiosis (6.6 %). The morphological characters of the detected *Eimeria* species has been mentioned. These in addition to *Cysticercosis* (16.36%) and body and ear mange (52.34 %). There were a relationship between age, breed of the examined rabbits in addition to the season of the examination and types of the prevalent parasitic diseases.

INTRODUCTION:-

The rabbit industry in Egypt grows rapidly to meet the increase in human demand for rabbit meat. Rabbits can cover this increased de-

mand, a doe delivery 4 litters per year in each 7-8 youngs (*Steven, 1974 and Lapage, 1956*). Broiler rabbits attain alive body weight of 1.8 kg at 8th week of age which is considered the age of slaughtering (*Saad, 1970*). Besides being efficient converters of vegetable protein into high-quality animal protein. Rabbit meat is low fat, good flavour and easily digested (*William et al., 1964*). The fur of some rabbit breeds have a very high economical value by product (*Sandford and Woodgate, 1979*). Other uses including wool production, Angoras can produce up to 1000 g of high quality wool per year. Moreover, purebred show animals are raised as a hobby, and rabbits of all shapes and colours are kept as pets (*Okerman, 1999*). Also, the importance of rabbits for medical and biological institutions has also been well appreciated and tends for raising clean colonies as laboratory animals have elected great interest particularly for solving human and animal problems which are obscure (*Morgan and Hawkins, 1949; Steven, 1974 and Cooper, 1976*). As a

result of this fact, rabbits have recently received increased interest as an intensive rabbit breeding in the commercial production programs. Concurrent with this intensive breeding of rabbits there is an increased interest in their diseases particularly the parasitic constrains (*Ezzat, 1955, Hamed, 1978 & 1988 and Fahmy et al., 1985*). The present work was done in order to investigate the incidence of some parasitic diseases affecting rabbits at different ages, breeds and seasons in Ismailia Province.

MATERIALS AND METHODS:-

The samples of the present study were taken from 77 diseased rabbits and 183 freshly dead rabbits, in addition to examination of the viscera .

Also, rabbits of various breeds, sex, and ages were collected from different private or governmental farms, besides cases submitted for postmortem examination to the Department of Poultry Diseases, Animal Health Research Institute, Ismailia branch, all rabbits were

subjected to clinical and postmortem examinations according to *Catchpole & Norton (1979)*. The diseased and freshly dead rabbits were examined externally and internally and the clinical findings and gross lesions of both were reported. Thick and thin blood films were taken from the living cases and prepared for detection of blood parasites. The brain was examined macroscopically, impression smear fixed with Bouin's solution, stained with Gemsa, examined microscopically for the protozoan diseases. Skin scraping was carried out according to *Lapage (1956)*, *Soulsby (1982)*, and *Curtis & Brooks (1990)* where the ear discharge or scraping of skin lesions are subjected to direct microscopical examination or treated in heated sodium hydroxide solution 10% in water bath and then microscopically examined. The trachea and bronchi were cut opened longitudinally and examined macro- and microscopically for detection of any lung worms.

Macr- and microscopic examination of the spleen and kidney for the

detection of *Hepatozoon cuniculi* and *Encephalitozoon cuniculi* respectively. Also macroscopic examination of the preteroneum and mesentery for detection of *Cysticercus pisiformis*. External and internal examination of the stomach, for detection of parasites especially the nematode parasitic worms *Graphidium strigosum* according to *Boag (1988)*. Also each part of the intestine was externally examined and longitudinally incised and examined with its content according to *Soulsby (1982)*, and *Georgi. (1990)* for different parasitic groups especially coccidian stages. Also liver and gall bladder of diseased rabbits showed gross lesions were carefully examined for detection of coccidian oocysts. The detected parasites especially unsporulated and sporulated oocysts of *Eimeria* species were identified microscopically according to the different keys.

RESULTS:-

Examination of 260 diseased or dead rabbits were collected from different localities in Ismailia Pro-

vince was carried out for the detection of parasitic diseases during one year months (2001 -2002).

The diseased rabbits encountered in this study were 77(29.62%) and the dead carcasses were 183 (70.38 %) Table (1).

The clinical examination of diseased rabbits revealed that the clinical signs associated with the parasitic infestation were off food , emaciation, weakness , anorexia, retarded growth, diarrhea, dehydration, salivation moisted the mouth region, diarrhea souled the hind quarter followed by paralysis of limbs and finally death. In other cases tympany could be seen, also rabbits suffered from itching and loss of hair with scales formation.

I-Genus *Eimeria*:-

Six species of *Eimeria* oocysts were recorded in this study, of which five ones were intestinal : *E. intestinalis* , *E. magna* , *E. media*, *E. perforans*, *E. piriformis* and the sixth species is the hepatic one *E. stiedae*.

A- Morphological characters of intestinal coccidiosis .

1-Intestinal species:

1) *Eimeria intestinalis* (Fig. 1 & 2)

The oocysts were pear shaped , yellowish in colour , with micropyle and measured 30 x 20 U.

Sporulation time 48 hrs at room temperature.

2) *Eimeria magna* (Fig 3 a & b)

The oocysts were ovoid in shape, yellow to yellowish-brown in colour, measured 39.2 x 25.6 . Its wall was smooth consisting of two layers. The micropyle was large, prominent and with shoulders like protrusions. Sporulation occurred within 3 days at room temperature.

3) *Eimeria media* (Fig 4)

The oocysts were ellipsoidal in shape, measured 28 x 20 U. The oocystic wall was smooth, light pink in colour. The micropyle is well defined. The sporulation time 24 hours at room temperature .

4) *Eimeria perforans* (Fig 5 a & b)

E. perforans was the smallest species infect rabbits . The oocysts measured 21.6 x 17 U. The micropyle not readily distinguishable. The oocysts wall smooth, colour-

less. The sporulation time was 24 hours at room temperature.

5) Eimeria piriformis (Fig 6 a & b)

Oocysts are pear – shaped, yellowish in colour and with a prominent micropyle and a smooth wall. They measure 29 x 18 U. Sporulation time was 24 hours at room temperature.

B-Morphological characters of hepatic species *Eimeria stiedae* (Fig 7)

This species of Eimeria is detected in liver lesions and faecal specimens. The oocysts were ovoid to ellipsoidal in shape, smooth-walled, yellowish orange, measured 38 x 22.9 U . It possessed a distinct micropyle. Sporulation time was 3 days at room temperature .

***Cysticercus pisiformis*:**

Cysticercus pisiformis was the only type of cysticerci that recorded in the rabbits. Among 260 examined specimens, 35 were infected (16.36%) (Table 2 and Fig 8). Seasonally, infection rate was high in Winter and low in Spring. The cysts were encapsulated and aggregated like bunches of grapes on the serous membranes of the abdominal viscera .

Postmortem findings:

The postmortem examination of dead or diseased rabbits with coccidiosis revealed that, there is moderate to large enlargement of the liver, dark red in colour and the presence of nodular abscesses, reach the pea size. In case of intertinal coccidiosis the intertinal wall was thickened and haemorrhagic with pinpoint white or greyish – white foci and the intestinal content was mixed with blood and mucus.

All affected rabbits with ear mange suffered from inflamed swollen ears, contained excessive debris and scales .In rabbits affected with body mange, the lesions appeared on the upper and lower lips, pads, claws and body showed losses of fur, with scales formation, with itching and inflammation of the affected parts. The different parasitic diseases of the present study were coccidiosis, cysticercosis and mange, with a percentage of 31.31, 16.36 and 52.34% respectively as shown in Table (2). Distribution of parasitic diseases in different ages of the examined rab-

bits, showed highest infestation rate of intestinal coccidiosis (37.4 %) in rabbits aged 1 – 2 month, moderate (22.5%) in rabbits aged 3 – 4 months followed by (21.4 %) in 7 – 8 months and lowest (16.7 %) in rabbits aged 5 – 6 months. The most prevalent disease in rabbits aged 1 - 2 months, was the intestinal coccidiosis (37.4%) followed by mange (12.1%) and cysticercosis (11%). The most prevalent parasitic diseases in rabbits aged 3 – 4 months were intestinal coccidiosis (22.5 %) followed by mange (17.5 %) and hepatic coccidiosis (12.5%). The lowest was cysticercosis (7.5%). Rabbits aged 9 -10 months and over 11 months, revealed no incidence of both types of coccidiosis, high incidence of mange (85.7 and 59.4% respectively) and cysticercosis (14.3 and 15.6%) Table (3).

In Table (2) the incidence of coccidiosis in Neozeland, California, Chinchilla and Baladi breeds were 7.0, 5.14, 3.27 and 15.89% respectively. The highest incidence of cysticercosis (6.54%) was recorded in

Baladi breeds and lowest in Chinchilla breeds of rabbits (2.34%).

The incidence of ear and body mange in Neazeland, California, Chinchilla and Baladi were 11.21, 7.48, 5.61 and 28.03% respectively.

In Table (4) the incidence of intestinal coccidiosis in Autumn, Winter, Spring and Summer was 5.38, 6.54, 3.46 and 2.69 % respectively. The highest rate of hepatic coccidiosis (3.64 %) was recorded in Winter while, the lowest (0.15%) in Spring. The highest incidence of cysticercosis was recorded (8.08%) in Winter and the lowest one in Spring (0.77%).

The highest incidence of ear mange was in Autumn, and of the body mange in Winter. Moreover, the lowest rate of body mange in Spring and Summer, Table (4).

Table (1): Number, breed and age of examined freshly dead and alive rabbits.

| Breed of Examined rabbits | Age / month | | | | | | | | | | | | Total |
|---------------------------|-------------|------|-------|------|-------|------|-------|------|-------|------|----------|------|-------|
| | 1-2 | | 3-4 | | 5-6 | | 7-8 | | 9-10 | | 11-above | | |
| | Alive | dead | Alive | dead | Alive | dead | Alive | dead | Alive | dead | Alive | dead | |
| Baladi | 10 | 32 | 7 | 4 | - | 20 | 4 | 8 | 4 | - | 16 | 13 | 118 |
| Clifronia | 3 | 13 | 2 | 8 | 2 | 5 | 1 | 4 | 2 | - | 3 | 3 | 25 |
| Chinchilla | 1 | 6 | - | 4 | - | 3 | 3 | 2 | - | - | 5 | 6 | 67 |
| Neozland | 2 | 20 | 4 | 14 | 2 | 7 | - | 6 | 1 | - | 29 | 27 | 260 |
| Total | 16 | 71 | 13 | 30 | 4 | 35 | 8 | 20 | 7 | - | 29 | 27 | |

Total examined diseased rabbits = 77 (29.62%)

Total examined freshly dead rabbits = 183 (70.38%)

Table (2): Parasitic Diseases among the examined species of rabbits.

| Breed | Coccidiosis | | Cestode; Cysticercus pisiformis. | | Mange | | Total | % |
|------------|----------------|-------|----------------------------------|------|----------------|-------|-------|-------|
| | N ^a | % | N ^a | % | N ^a | % | | |
| Neozland | 15 | 7.00 | 9 | 4.20 | 24 | 11.21 | 48 | 22.43 |
| California | 11 | 5.14 | 7 | 3.27 | 16 | 7.48 | 34 | 15.89 |
| Chinchilla | 7 | 3.27 | 5 | 2.34 | 12 | 5.61 | 24 | 11.21 |
| Baladi | 34 | 15.89 | 14 | 6.54 | 60 | 28.03 | 108 | 50.47 |
| | 67 | | 35 | | 112 | | 214 | |

Table (3) : Distribution of parasitic diseases among examined rabbits.

| | Age / month | | | | | | | | | | | | Total N ^o of R. in various age group |
|-----------------------------------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|----------------------|------|--|
| | 1 - 2 | | 3 - 4 | | 5 - 6 | | 7 - 8 | | 9 - 10 | | 11 - above | | |
| | * No. of ex.R. | % | * No. of ex.R. | % | * No. of ex.R. | % | * No. of ex.R. | % | * No. of ex.R. | % | * No. of ex.R. | % | |
| 1) Single infestation: | | | | | | | | | | | | | |
| H.coccidiosis | 6 | 6.6 | 5 | 12.5 | 4 | 13.3 | -- | -- | -- | -- | -- | -- | 15 |
| Int.coccidiosis | 34 | 37.4 | 9 | 22.5 | 5 | 16.7 | 3 | 21.4 | -- | -- | -- | -- | 51 |
| Cysticercosis | 10 | 11 | 3 | 7.5 | 6 | 20 | 1 | 7.1 | 1 | 14.3 | 5 | 15.6 | 25 |
| Mange | 11 | 12.1 | 7 | 17.5 | 8 | 26.7 | 4 | 28.6 | 6 | 85.7 | 19 | 59.4 | 56 |
| 2) Mixed infestation: | | | | | | | | | | | | | |
| H.int.coccid. | 8 | 8.8 | 4 | 10.0 | -- | -- | 2 | 14.3 | -- | -- | 2 | 6.3 | 16 |
| H.int.coccid.,cystic roosis | 2 | 2.2 | -- | -- | -- | -- | 2 | 14.3 | -- | -- | -- | -- | 4 |
| H.coccidiosis,cystic ercosis | 4 | 4.4 | 2 | 5.0 | 1 | 3.3 | -- | -- | -- | -- | 1 | 3.1 | 8 |
| H.coccidiosis,mange | -- | -- | 4 | 10.0 | 2 | 6.7 | -- | -- | -- | -- | -- | -- | 6 |
| Int.coccidiosis,cystic ercosis | 8 | 8.8 | 2 | 5.0 | 4 | 13.3 | 2 | 14.3 | -- | -- | 3 | 9.4 | 19 |
| Int.coccidiosis,mange | 6 | 6.6 | 2 | 5.0 | -- | -- | -- | -- | -- | -- | -- | -- | 8 |
| Cyst.mange | 2 | 2.2 | 2 | 5.0 | -- | -- | -- | -- | -- | -- | -- | -- | 8 |
| *Total No. of ex. rabbits | 91 | | 40 | | 30 | | 14 | | 7 | | 32 | 6.3 | 6 |
| | | | | | | | | | | | | | 214 |

*Number of examined rabbits.

*Total number of rabbits in various age group.

*Int.intestine.

*H.Hepatic.

* Cyst. Cysticercosis

Table (4): Seasonal dynamics of different parasitic diseases in the examined rabbits .

| Season | | Parasite diseases | | | | |
|--------|-----|-------------------|---------|---------------|-------|------|
| | | Coccidiosis | | Cestode | Mange | |
| | | Intestinal | Hepatic | Cysticercosis | Ear | Body |
| Summer | No. | 7 | 4 | 8 | 8 | 6 |
| | % | 2.69 | 1.54 | 3.08 | 3.08 | 2.31 |
| Autumn | No. | 14 | 4 | 4 | 24 | 20 |
| | % | 5.38 | 1.54 | 1.54 | 9.23 | 7.69 |
| Winter | No. | 17 | 9 | 21 | 16 | 22 |
| | % | 6.54 | 3.46 | 8.08 | 6.15 | 8.46 |
| Spring | No. | 9 | 3 | 2 | 10 | 6 |
| | % | 3.46 | 1.15 | 0.77 | 3.85 | 2.31 |

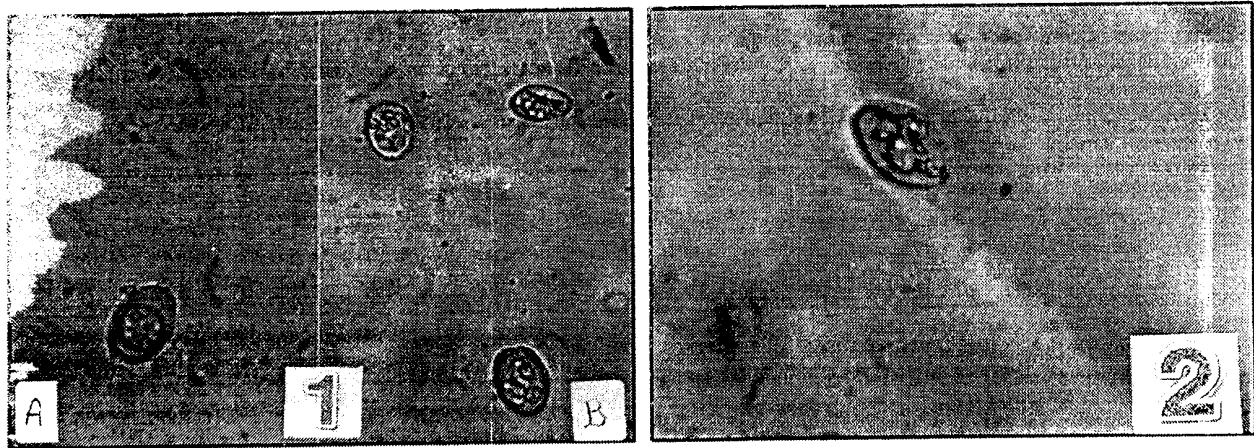


Fig.(1 & 2): a- Non sporulated oocyst .
b- Sporulated oocyst of *E. intestinalis* (X 400)

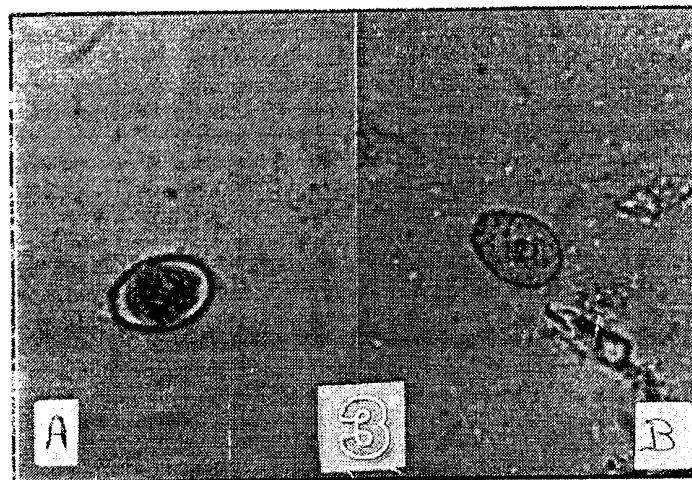


Fig.(3): a- Non sporulated oocyst .
b- Sporulated oocyst of *E. magna* (X400)

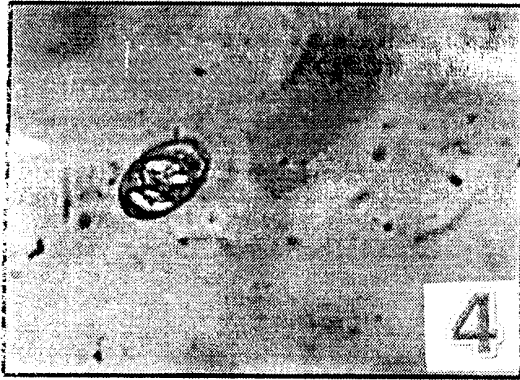


Fig.(4): Sporulated oocyst of *E. media*.

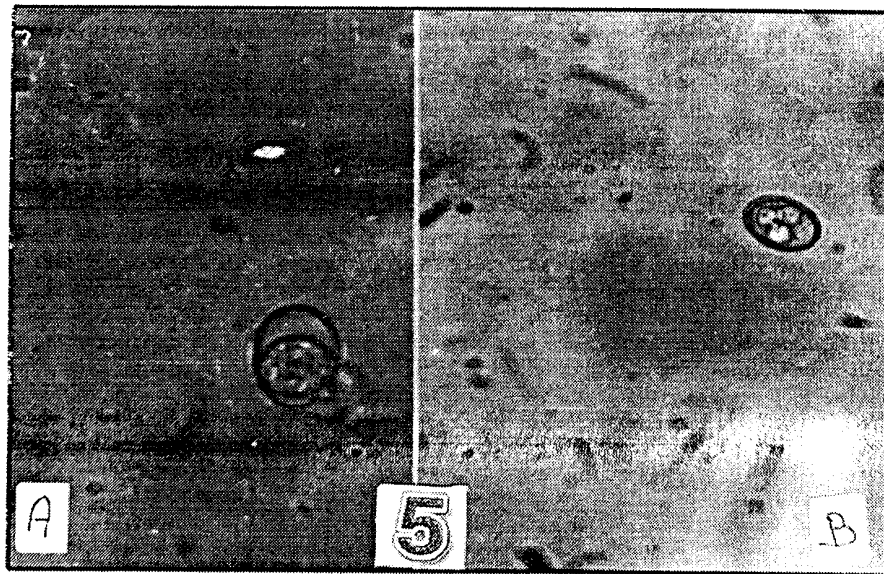


Fig.(5): a- Non sporulated oocyst .
b-Sporulated oocyst of *E. perforans*(X400)

Fig.(6): Sporulated oocyst of *E. piriformis* (X400)

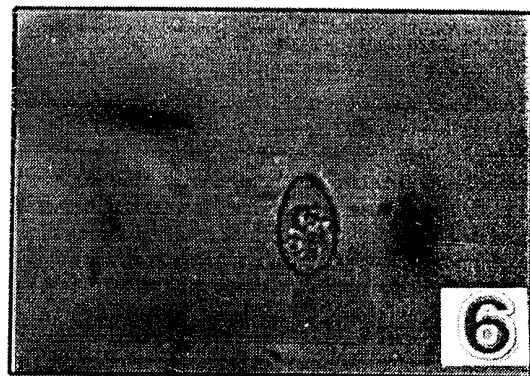




Fig.(7): Oocysts of *E.stiedae* from liver lesions(X400)

Fig.(8): Liver, stomach and intestine of affected rabbit with cysticercosis.



Fig.(9): *Psoroptes communis* var *cuniculi*, female.

Fig.(10): *Psoroptes communis* var *cuniculi*, Larva.



DISCUSSION:-

In the present study six species of *Eimeria* were detected among rabbits in Ismailia Province. In Egypt *Ahmed (1952)*, *Abd - EL Rhaman (1972)*, *Abd Alla (1988)* and *Ibrahim (1990)* detected various number of *Eimeria* species in rabbits. Also in other countries *Rodriguez (1973)* in Spain, *Catchpole and Norton (1979)* in Britain and *Peeters, et al. (1981)* in Belgium recognized various number of *Eimeria* species in rabbits. From the descriptive point of view, it was found that the present results were similar to that previously described by *Pellerdy (1965)*, *Levine (1985)* and *Ibrahim (1990)*. In the present study the incidence of coccidiosis among rabbits was 31.31% which is lower than that recorded by *Abd Alla (1988)* (72.2%) while *Abd EL- Rhman (1972)* reported a lower incidence (36.4%) among rabbits in Assiut Province. *Saad (1970)* and *Ibrahim (1990)* recorded the rate of 37.7% and 65.8% in Giza respectively. The incidence of *Eimeria* infection in other countries were high in Britain (96%) *Catchpol and Norton*

(1979) and U.S.A. (60 - 100%) *Pot (1985)*.

The recorded parasitic diseases in the present investigation were coccidiosis , cysticercosis , mange with an incidence of 31.31, 16.36 and 52.34% respectively.

These findings were in agreement with *EL - Massry (1983)*; *Fahmy et al, (1985)*, *Doag, (1985)* and *Ibrahim (1990)*.

In this investigation, there was a relationship between rabbit age and the type of the recorded parasitic disease. Intestinal coccidiosis (37.4%) was mostly prevalent in rabbits age 1 - 2 months, moderately prevalent (22.5 and 21.4%) in rabbits age 3 -4 and 7 - 8 months respectively . The hepatic coccidiosis was recorded in rabbits age 1 - 6 months . and not recorded in rabbits age 7 - 11 months or more.

Cysticercosis was mostly prevalent (20%) in rabbits age 5- 6 months and followed (15.6 and 11%) by rabbits age 11 and more and 1- 2 months respectively .

The mange was mostly recorded , (85.7 and 59.4%) in rabbits aged 9 -10 and 11

months or more respectively. These findings were somewhat in agreement with those obtained by *Fahmy, et al. (1985) and Atalla et al., (1986)*.

In this study, the relationship between the incidence of parasitic diseases and the breeds of examined rabbits was recorded. Coccidiosis in Neozeland, California, Chinchilla, and Baladi breeds were 7, 5.14, 3.27 and 15.89% respectively. The highest incidence of coccidiosis was recorded in baladi rabbits while, the lowest one was of Chinchilla breed. The highest incidence of cysticercosis was recorded in Baladi breed meanwhile, the lowest one was of Chinchilla breed. The highest incidence of mange was recorded in Baladi breed and the lowest one was recorded in Chinchilla rabbits.

These findings suggested the presence of breed resistance, due to the variation in hygienic requirements provided to each breed in agreement with *Saad (1970) and Hamed, (1978)*. The present work showed that, the higher incidence of coccidiosis recorded in Winter and Autumn while the lowest one recorded in Summer and Spring.

These results agreed with that previously given by *Abd Alla (1988) and Ibrahim (1990)*. *Hollands et al. (1988)* stated that coccidiosis has a relationship with rain fall in agreement with the present results. On the contrary *Novinskaya et al. (1983)* in USSR stated that the incidence of infection was high in Summer and Autumn and low in Spring and Winter, these variations in seasonal dynamics may be due to the different climatic status in different countries.

The highest incidence of cysticercosis was recorded in Winter meanwhile, the lowest one was recorded in Spring. This may be due to the presence of dog under rural condition harbouring the adult tape worms, which contaminated the green fodders of rabbits in Winter such as Barseem agreement with *Saad, (1970) and Schutze (1976)*. The highest incidence of ear and body mange was recorded in Autumn and Winter while, the lowest incidence of both was recorded in Spring and Summer, in agreement with the findings obtained by *Hamed (1978)*. It was concluded that the most prevalent parasitic diseases in rabbits were intestinal and hepatic coccidiosis, body and ear mange and cysticercosis. The mostly

affected age of rabbits with the parasitic diseases was 1– 5 months meanwhile, the adult age is less affected except with mange. The most affected breed with parasitic diseases was Baladi meanwhile the most resistant breed was chinchilla.

The parasitic diseases were mostly prevalent in Winter and lowest in Spring and Summer.

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الملخص العربي

(الأمراض الطفيلية في الأرانب في محافظة الإسماعيلية)

عفت الششتاوى

معهد بحوث صحة الحيوان – الإسماعيلية

أجريت هذه الدراسة على ٢٦٠ أرنباً ذات أعمار وسلالات مختلفة والمأخوذة عشوائياً من مناطق مختلفة بمحافظة الإسماعيلية على مدار عام كامل وذلك لدراسة واستبيان الأمراض الطفيلية التي تصيب الأرانب في فصول السنة المختلفة. تم فحص العينات ظاهرياً ومجهرياً بالإضافة إلى استخدام الوسائل المعملية الأخرى لـشـف وتحديد أماكن وتصنيف الطفيليات ومن خلال هذه الدراسة أمكن تلخيص الأعراض المرضية التي تم ملاحظتها على الأرانب المصابة حيث كانت تعاني من فقدان الشهية – هزال – إسهال – جفاف – زيادة إفرازات الفم و أحياناً شلل في الأطراف وخصوصاً الأطراف الخلفية والبعض الآخر ظهرت عليه انتفاخات وفقدان في شعر الجسم في مناطق مختلفة. أما الصفة التشريحية للأرانب النافقة فأوضحت احتقان بالأعضاء مع تراكم المخاط والسوائل المدممة داخل الأمعاء.

ومن هذه الدراسة تبين أن أكثر الأمراض الطفيلية شيوعاً في الأرانب في محافظة الإسماعيلية هي مرض الكوكسيديا المعوى و الكبدى و الأطوار اليرقية للديدان الشريطية و جرب الأذن و الجسم .

