دراسة عن الديدان في بعض الحيوانات الدقيقة الصغيرة

محافظة أسوان

1- الترباتودا

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في هذا البحث أجريت دراسة على الديدان المحمية من قسم الترباتودا لعدد 45 سمن الكلاب الضالة، 29 من القطط الضالة وكذلك 73 من الفئران والجرذان المختلفة. وجد الباحثون أن هذه الديدان تنتسب إلى عائلات مختلفة من قسم الديدان وهي: الأكسيستنسيدى الهيموريدى والتينوستنسيدى واليشكويلي. ولقد تشير المحافظات إلى أن الأنواع مختلفة للديدان ووجد أنها تنتمي إلى ثلاثة متر مشابه معتقداً من هذه العائلات، ولقد تم دراسة هذه الأنواع وتميزها عن بعضها البعض، واكتشف الباحثون نسج جديد في القطط وهو ثيند بلستوم وبيلوس

إسوانى.
STUDIES ON HELMINTH PARASITES IN SOME SMALL MAMMALS IN ASSIUT GOVERNORATE

1. TREMATODE PARASITES

(With 4 Tables & 4 Figures)

By

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SUMMARY

The trematode fauna of 45 stray dogs, 29 stray cats and 673 different rodents was estimated and surveyed. Representatives of 4 trematode families were encountered viz Echinostomatidae, Heterophyidae, Cyathocotyliidae and Diplostomatidae. Thirteen different species of trematode parasites were examined and described from them one new variety was reported from cats *Cyndiplostomum bubonii* var. *assiutis* n. var.

INTRODUCTION

The intimate association between man and some of the small mammals create, the necessity for the study of their helminthes, particularly because some of these parasites seems to be transmissible to man. The aim of this work was therefore to explore the trematode parasites of stray dogs, cats and rodents.

MATERIALS and METHODS

Animals were brought alive to the laboratory. Intestinal parasites were examined in 70% alcohol or 10% formalin fresh as well as from specimens fixed & stained in acetic acid alum carmine. Measurements were taken by the aid of eye piece micrometer and all drawings were done by camera lucida.

RESULTS and DISCUSSION

Family *Echinostomatidae* POCHE, 1926
Subfamily *Echinococchinae* ODHNER, 1910
Genus *Echinococasmus* DIETZ, 1909

1. *Echinococasmus illiputans* (LOOSS, 1896)

This parasite was occasionally recorded from the small intestine of stray dogs. The specimens collected measured from 860 - 960 U in length by 240 - 270 U in width. Oral sucker measures from 48 - 52 U in diameter. The ventral sucker is about twice the size of the oral sucker. The 24 collar spines are arranged in one dorsally interrupted row. The globular pharynx measures 40 - 42 by 33 - 38. Ovoid testes measure 180 by 110 and 170 by 99 U respectively, while the ovary measures 84 by 60 U. The eggs measure 27 - 29 by 14 - 17 U. They are operculated golden yellow in colour and each contains fully mature miracidium. Incidence of infection is shown in Table (1).

Discussion

The present material is similar to *E. illiputans* as described by FAHMY and SELIM (1959) from dogs. Minor differences were, however, noticed in the relative measurements, but these are not enough to separate it into a distinct species or a variety.

2. *Echinococasmus periolatus* (RATZ, 1908)

This parasite was recovered from the small intestine of dogs and cats. It is elongate with its extremities narrower than the middle of the body. The anterior rem form collar consists of 24 spines arranged in two alternating crowns, equal in size & number, among which three smaller ones exist on either side forming corner spines. Other wise the morphological features seen to be quite similar to the description of FAHMY & SELIM (1959). Incidence of infection is shown in Table (1).
Discussion

_E._ _perfoliatus_ was recovered on several occasions from man (TANABE, 1922, FAUST _et al._, 1975). The parasite was previously recorded from different birds (LOOSS, 1899, GOHAR, 1934 and GED, 1977) or from dogs (WITENBERG, 1933 and FAHMY & SELIM 1959) FAHMY _et al._ (1981) described the new variety, _E._ _perfoliatus_ var. _aegyptius_ from cats in Assiut province. The present specimens were diagnosed as _E._ _perfoliatus_ as they were very similar to the description given by FAHMY & SELIM (1959).

family _Echinostomatidae_ POCHE, 1926
Subfamily _Echinostomatinae_ STILES and HASSALL, 1926
Genus _Echinoparyphium_ DIETZ, 1910

_Echinoparyphium recurvatum_ (LINSTOW, 1873) LUHE, 1909

This parasite was recorded in the small intestine of the Norwegian rat. The adult worm is 2.77 - 4.50 mm in length and 0.52 to 0.75 mm in width. The head collar is reniform & carries double dosally uninterrupted rows of spines, about 42 in number; five of which are corner spines on each side. The oral sucker measures 144 - 168 by 120 - 144 U. The ventral sucker is about three times the size of the oral sucker. The pharynx measures 120 - 144 by 108 - 132 U. The testes occupy the four forths of the body. Ovary is shortly in front of testes. Vitelline glands are in the form of coarse follicles and occupy the lateral fields from the anterior margin of the ovary to the posterior end of the intestinal caeca. The ova are opeculatated, yellowish in colour, thin-shelled, measur 75 - 82.5 by 43 - 45 U. Incidence of infection among Norway rats is shown in Table (3).

Discussion

According to DAWES (1946) & YAMAGUTI (1958) _E._ _recurvatum_ is mainly a parasite of birds. It was also recorded from man by WATSON (1960). KHALIL & ABAZA (1926) described the new species _E._ _aegypticus_ as a natural infection of unidentified rat. AZIM (1930) redescribed _E._ _recurvatum_ from experimental infection of rats showed that _E._ _aegypticus_ of KHALIL and ABAZA was actually a synonym of _E._ _recurvatum_. OMRAH (1973) found that the cercariae of _E._ _recurvatum_ encyst either in the snail _Physa acuta_ or in the musculature of the toad _Bufo regularis_. EL-NAFFAR & KHALIFA (1975) recorded the parasite in buff-backed heron (_Ardea ibis ibis_). As this bird is not a snail eater, they concluded that the infection might occur by swallowing of infected toads. The some suggestion may be applied to the rat _Rattus Norvegicus_. _E._ _recurvatum_ described during the present study might be considered as the first record in the Norray rats.

Family _Heterophyidae_ ODHNER, 1914
Subfamily _Haploporchinae_ LOOSS, 1899
Genus _Haploporchis_ LOOSS, 1899
1- _Haploporchis pumilio_ (LOOSS, 1896)

This is a very common parasite of the small intestine of different mammals. The morphological features are exactly similar to those reported by KHALIFA _et al._ (1977). Incidence of infection in different mammals is shown in Table (1,2,3).

Discussion

_Haploporchis pumilio_ was described in many occasions from wide variety of birds & animals in Egypt (LOOSS, 1896, KHALIL, 1932, GOHAR, 1934, FAHMY & SELIM, 1959 & KHALIFA _et al._, 1977). The commonest natural host is the dog or cat (KUNTZ & CHENDLER, 1956) as well as fish-eating birds. KHALIFA _et al._ (1977) added to the list of hosts _Rattus rattus_ frugivorus, _Ardea ibis ibis_ and _Gallus gallus domestica_ in Assiut province. During the present study, the parasite was also found in dogs, cats and different rodents. Among rodents, _Rattus rattus_, _Rattus norvegicus_, _Arvicanothis_ _piloticus_ are new host records in Egypt.

2- _Haploporchis Yokogawai_ (KATSURA, 1932)

This is rather uncommon parasite of mammals in Assiut area. It was found in the small intestine of different rodents, stray dogs & cats. Incidence of infection is shown in Table (1,2,3).

Discussion

This parasite was recorded from different parts of the world (KATSUTA, 1932, GROHAN, 1934, AFRICA & GRACIA, 1935, CHEN, 1936, KOYABASHI, 1942, OEDINING, 1962, FAHMY _et al._, 1976). It was noticed to be less common among the examined animals. This might be due to the fact that _H._ _Yokogawai_ is more adapted to parasitize birds.

3- Haplorchis taichui (NISHIGORI, 1924)

This is a rare parasite of mammals. It was found in the small intestine of stray cats. Incidence of infection is shown in Table (2).

Discussion:

During the present study, H. taichui was encountered only in cats. Worm burden was also noticeably low. According to PEARSON (1964), the parasite seems to be more common in birds.

Genus Phagicola (FAUST, 1920)

Phagicola longa (RONSAM, 1920)

This species was recovered from small intestine of stray dogs & cats. Morphological features of the adult agree with the description of MORGAN & HAWKINS (1951).

Discussion:

This parasite was recorded by FAHMY & SELIM (1959) in 60%, of dogs fed on Mugil fish. The parasite has been also reported naturally in dogs & cats by AZIM (1938 & 1939). This is the first record of that parasite from Upper Egyptian hosts.

Family Cyathocotylidae POCHE, 1920

1- Genus Prohemistomum ODHNER, 1913

Prohemistomum vivax (SONSINO, 1893)

This is rather a common parasite of stray dogs, cats and rodents. Incidence of infection is shown in Table (1,2,3). Morphology of the adult is identical with previous records with the exception of the possession of two rows of ventral glands shown in Figure ( ).

Discussion:

In Cairo, AZIM (1938) and FAHMY & SELIM (1954) recorded the parasite from intestine of dogs. In Assiut, EL-NAFFAR (1970) reported the parasite in dogs. NASR (1961) reported the first case of human infection in Egypt.

Prohemistomum vivax described within the present study differ from that described by EL-NAFFAR & KHALIFA (1975) from the buff-backed heron in being larger in measurements. This might be due to different biological conditions in the intestine of animals & birds. Moreover, the ventral glands reported in the present study had never been reported by previous authors. They are faulty seem in fresh specimens but could be preparly seen in well flattened specimens after staining in acetic acid alum carmine. ARAFA (1968) reported a species belonging to the genus prohemistomum from various species of rodents in Egypt. However, the present authors could identify the species in rodents as Prohemistomum vivax and it was found to be identical with these found in dogs and cats.

2- Genus Mesostephanus LUTZ, 1935 Mesostephanus melvi YAMAGUTI, 1939. This parasite was encountered from the small intestines of stray dogs & cats. Living worms appeared to have no conspicuous ventral curvature. The worm is elongate in shape (Fig. ) with aspinose integument. It measures 1.5 - 1.65 mm in length & 0.6 - 0.63 mm in width. The oral sucker is subterminal & measures 52 - 54 by 70 - 73 U & the pharynx is 55 - 60 U in diameter. The oesophagus is short & measures about 100 - 108 U. The ventral sucker is in distinct & measures 70 - 73 by 65 - 67 U. The holdfast organ is indistinct. The testes are widely separated, the anterior is slightly larger than the posterior, measuring 160 - 168 by 154 - 156 U & 140 - 144 by 132 - 135 U respectively. The ovary is usually dextral in position, ovoidal in shape & measures 72 by 75 U. The irrus pouch measures 420 by 83 U. The eggs are operculated, yellowish in colour & each contains immature embryos. They measure 102 - 108 by 60 - 66 U. Incidence of infection in different mammals examined is shown in table (1,2).

Discussion:

DUBOIS & PEARSON (1963) were the first to report the presence of members of the genus Mesostephanus in Egypt. They recorded Mesostephanus melvi YAMAGUTI, 1939 in two cats from Dakahlia Province & kites from Beheira & Faiyum Provinces. They stated that it was very difficult to differentiate between the members of the genus Prohemistomum and the genus Mesostephanus. The only clear difference in the latter genus is the presence of a vaginal sphincter and the absence of a porofound ventral concairity Mesostephanus melvi discovered during the present study could be differentiated from Prohemistomum vivax in having.
1- Body longiform with blunt anterior and posterior tail like appendage.
2- No conspicuous ventral concavity.
3- No ventral glands.
4- Holdfast organ is ill developed.
5- Vitelline glands are more conspicuous.
6- Smaller suckers & indistinct ventral sucker.
7- Testes are widely separated.
8- Short cirrus pouch, not extending beyond the posterior border of the ovary.
9- Ovary dextral in position.
10- Vaginal spincter is prominent.
11- Eggs are bigger in size.

These differences might facilitate the identification of the two species previously described from the genus Mesostephanus viz. M. melvi by YAMAGUTI (1939) and M. indicus by VIDYARTHII (1948). Mesostephanus melvi seems to be described for the first time from Egyptian dogs which are host records for the parasite.

Family Diplostomatidae POIRIER, 1886
Subfamily Diplostomatinae MONTICELLI, 1892
Genus Cynodiplostomum DUBOIS, 1936
1- Cynodiplostomum azimi (GOHAR, 1933) DUBOIS, 1936

This parasite was recorded in the small intestine of stray dogs & cats as well as rodents. Incidence of infection is shown in Table (1,2,3).

Discussion:
Many observers described natural infection of dogs & cats by C. azimi (GOHAR, 1933, KUNTZ & CHANDLER, 1956, FAHMY & SELIM, 1959 & DUBOIS & PEARSON, 1963). KHALIFA et al. (in press) described the metacercaria of the parasite in the muscles of fish Clarias lazera & were able to bring up adults in laboratory rats. However, Rattus norvegicus is a new host record for this parasite.

2- Cynodiplostomum dubosi KHALIFA et al. (in press)

This parasite was encountered in the small intestine of stray dogs, cats & Norway rats. Incidence of infection is shown in Table ( ). The most important morphological features are shown in figure ( ).

Discussion:
The new species C. dubosi was erected by KHALIFA et al. (in press) for parasites obtained naturally from cats & dogs & experimentally raised in albino rats. The present material were found to be identical with C. dubosi. However, Rattus norvegicus is a new host record for the parasite.

3- Cynodiplostomum dubosi var. assiutis n. var.

This parasite was encountered in the small intestine of dogs, cats & Norway rats. It measures 1.42 - 1.58 mm in length & 1.17 in width. Ratio between forebody & hindbody is about 1:1. The forebody measures 706 - 794 U while hindbody measures 714 - 786 U. Oral sucker is subterminal & measures 120 - 124 by 72 - 76 U. Oesophagus is short & does not exceed 72 U in length. It bifurcates into 2 thickwalled simple intestinal caeca which could be traced to the posterior level of the ventral sucker. Ventral sucker is slightly smaller than the oral sucker & measures 82 - 96 by 72 - 76 U. The distance between the two suckers is about 400 U. Lateral pseudo suckers are well-developed & the holdfast organ is flattened into two wing like projections (Fig. ). It measures 168 - 180 by 400 U. The vitelline glands occur in the form of medium sized follicles extending from the level of the oesophageal bifurcation & fill the lateral fields of the forebody. The hindbody contains the genitalia. The anterior testis is monolobed, obliquely situated on the right lobe of the posterior testis. It measures 408 - 416 by 276 - 280 U. The posterior testis is bilobed, the right lobe measures 390 - 400 by 240 - 256 U & left lobe measures 330 - 336 by 228 - 240 U. They are connected by a comparatively thick isthmus. The ovary is ovoidal in shape & measures 168 - 180 by 120 - 128 U. The uterus contains from four to six eggs. The ova are yellowish and measure 90 - 94 by 60 - 66 U. Incidence of infection is shown in Table ( ).

Discussion:

Although the parasite under discussion has a great resemblance to *C. duboisii* yet they differ from each other in different aspects (Table ). The main differences are, the size, ratio of fore & hindbodies, of the parasites & shape of holdfast organ, level of vitelline gland & size of eggs. These differences are enough to consider the present flukes & distinct form of *C. dubovisi*, but owing to the agreement in other features, the present authors consider that as belonging to a hitherto unknown variety, the name *Cynodiplosternum duboisii* var. Assuitis n. ver. is suggested for them.

REFERENCES


M.A.M. FAHMY, et al.


EXPLANATION OF FIGURES

Fig. (1): Prohemistomum vivax adult worm
Fig. (2): Mesostemphus melvi adult worm
Fig. (3): Cyndiplostomum duboisii adult worm
Fig. (4): Cyndiplostomum duboisii Var assutus n. Var adult worm

## PARASITES OF SMALL MAMMALS

### Table (I): Tsevatode Parasites encountered in stray dogs in Assiut province

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<th>no type of infection</th>
<th>% single</th>
<th>% mixed</th>
<th>infection worm burden</th>
<th>%</th>
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### Table (II): Trematoda parasites encountered in stray cats in Assiut province

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### Table (III): Trematoda parasites in rodents in Assiut province

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<td>4-12 (3)</td>
<td>K. vivax</td>
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<td>63</td>
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<td>6.4</td>
<td>-</td>
<td>-</td>
<td>8</td>
<td>6.4</td>
<td>1.3 (2)</td>
<td>O. kami</td>
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<td>Arvicanthus niloticus</td>
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<td>5</td>
<td>5.8</td>
<td>-</td>
<td>-</td>
<td>5</td>
<td>5.8</td>
<td>4.2 (6)</td>
<td>H. pumilio</td>
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<td>86</td>
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<td>4.64</td>
<td>2</td>
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<td>3.4</td>
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<td>H. yokogawai</td>
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<td>4.12</td>
<td>4.12</td>
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<td>P. vivax</td>
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<td></td>
<td>86</td>
<td>1</td>
<td>1.6</td>
<td>-</td>
<td>-</td>
<td>1.6</td>
<td>1.6</td>
<td>2 (2)</td>
<td>C. duboisii</td>
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<tr>
<td></td>
<td>86</td>
<td>1</td>
<td>1.6</td>
<td>1</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1 one only</td>
<td>C. duboisii var assitiis</td>
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<table>
<thead>
<tr>
<th></th>
<th>Cynodiplostomum azimi Gohar, (1933)</th>
<th>C. azimi Present work (1979)</th>
<th>C. duboisii Khalifa, et al. (inpress)</th>
<th>C. duboisii Present work (1979)</th>
<th>C. duboisii var Assiut id n. var (1979)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ratio of fore body and hind body</td>
<td>1: 0.66</td>
<td>1: 0.5</td>
<td>1: 0.9</td>
<td>1: 0.75</td>
<td>1: 1</td>
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<tr>
<td>Distance between suckers</td>
<td>360</td>
<td>400</td>
<td>300</td>
<td>440</td>
<td>400</td>
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<tr>
<td>Position of V.S.</td>
<td>Away from Tribocytic organ</td>
<td>Away from tribocytic organ</td>
<td>very near to tribocytic organ</td>
<td>near tribocytic organ</td>
<td>near tribocytic organ</td>
</tr>
<tr>
<td>Intestinal caeca</td>
<td>thin walled</td>
<td>thin walled</td>
<td>Thick walled</td>
<td>Thick walled</td>
<td>Thick walled</td>
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<tr>
<td>Intestinal</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Size of testis</td>
<td>1/2 these of C. duboisii</td>
<td>1/2 these of C. duboisii</td>
<td>twice these of C. azimi</td>
<td>twice these of C. azimi</td>
<td>Twice these of C. azimi</td>
</tr>
<tr>
<td>Position of ovary</td>
<td>Totally submedian</td>
<td>totally submedian</td>
<td>Partly submedian</td>
<td>Partly submedian</td>
<td>submedian</td>
</tr>
<tr>
<td>Position of tribocytic organ</td>
<td>equatorial of post</td>
<td>equatorial</td>
<td>pre-equatorial</td>
<td>pre-equatorial</td>
<td>equatorial</td>
</tr>
<tr>
<td>Vitellaria</td>
<td>to a level above the ventral sucker</td>
<td>to the posterior level of the lateral</td>
<td>Just reaching the upper surface of v.s.</td>
<td>to the level of the v.s.</td>
<td>to a level midway between oral &amp; ventral suckers</td>
</tr>
<tr>
<td>Size of eggs</td>
<td>0.098 - 0.102x</td>
<td>0.090 - 0.100x</td>
<td>0.110 - 0.130x</td>
<td>0.106 - 0.120x</td>
<td>0.09 - 0.094x</td>
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<tr>
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<td>0.048 - 0.052</td>
<td>0.048 - 0.060</td>
<td>0.058 - 0.062</td>
<td>0.060 - 0.064</td>
<td>0.060 - 0.066</td>
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</tbody>
</table>