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# *STUDIES ON HELMINTH PARASITES OF SYNODONTIS SCHALL AND BAGRUS BAYAD FROM BENI-SUEF WATER RESOURCES*

*(With 24 Figures)*

*By*

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دراسات وصفية للديدان المعوية في أسماك الشال والبياض بمحافظة بني سويف

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أثبتت الدراسة أن أسماك الشال عوائل طبيعية لستة ديدان من الديدان المعوية ، ولقد أمكن التعرف على هذه الديدان فكانت ثلاثة منها تتبع الديدان الورقية (تريماتودا) واثنتان تتبع الديدان الشريطية (سيستودا) ودودة واحدة من الديدان الاسطوانية (نيماتودا) . وبالنسبة للديدان المعوية التي وجدت بأمعاء أسماك البياض فلقد أثبتت الدراسة أن أسماك البياض عوائل طبيعية لثمانية ديدان من الديدان المعوية وأمكن التعرف على هذه الديدان فكانت ثلاثة منها تتبع الديدان الورقية ودودة واحدة تتبع الديدان الشريطية وأربعة من الديدان الاسطوانية ومعظم هذه الديدان سبق أن سجلت من أسماك البياض في أماكن متفرقة ماعدا دودة النيماتودا (بولي اوتكوبوثريم كلاريس ) والدودة الاسطوانية (رابدكونا اجبيتيكس ) اللتان سجلتا قبل ذلك من أسماك القراميط والثعابين على الترتيب . ويعتبر وجود هاتان الدودتان في أسماك البياض تسجيل جديد بالنسبة لنوع السمك والمكان.

## *SUMMARY*

The present study aimed to investigate the enteric helminth parasites which infest Synodontis schall and Bagrus bayad collected from Beni-Suef water resources.

Concerning the infestation with different helminth parasites among examined fishes, Synodontis schall was a natural host for Eumasenia aegyptiaus, Basidiodiscus ectorchis, Sandonia sudanesis, Wenyonia virils, Monobothrioides sp. and Cithariniella citharini.

Bagrus bayad revealed infestation with the trematodes: Acanthostomum spiniceps, Acanthostomum absconditum, Haplrochoides cahirnus and the nematodes, Capillaria yamaguti, Spinitectus allaeri and Procamallanus laeviconchus. It was worthy to mention that, Polyonchobothrium clarias and Rhabdochona aegyptiacus were recorded for the first time from Bagrus bayad in Beni-Suef Governorate as new host and new locality records.

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## INTRODUCTION

Fishes are the hope for solving a part of animal protein shortage problem allover the world. It has been considered to compensate the continuous lack of such element due to its comparatively low price. Many researchers in the world are interested in fish disease (SHALABY, 1985). The parasitic diseases constitute a major part and cause serious deterioration in fish production and reproduction. No data have been achieved on enteric helminth parasites infesting fresh water fish, Synodontis schall and Bagrus bayad in Beni-Suef Governorate water resources.

Many authors recorded trematode parasites from Synodontis schall and Bagrus bayad in other localities than Beni-Suef including Eumasenia aegyptiacus (MOHAMED, 1978; NEGM EL-DIN, 1987 and ABU ELEEZ, 1988); Sandonia sudanesis (McCLLELLAND, 1957; EBAID, 1967; EL-NAFFAR, 1970 and IMAM, 1971), Basidiodiscus ectorchis (FISCHTHL and KUNTZ, 1959; EBAID, 1967; IMAM, 1971) from Synodontis schall as well as Acanthostomum spiniceps LOOSS, 1899 reported by FISCHTHL and KUNTZ (1963), IMAM (1971), MORAVEC (1976) and ABU ELEEZ (1988); A.absconditum. LOOSS, 1901, reported by IMAM (1971), SAHALB (1982) and ABU ELEEZ (1988), Haplorochoides cahirinus LOOSS, 1899 reported by FISCHTHL and KUNTZ (1963), EL-NAFFAR (1970), IMAM (1971), NEGM EL-DIN (1987) and ABU ELEEZ (1988) from Bagrus bayad.

The cestode parasites Wenyonia virilis WOODLAND, 1923 described by IMAM (1971), FAHMY et al. (1976); EL-NAFFAR et al. (1983) and ABU EL ELEEZ (1988), Monobothrioides species FUHRMANN and BAER, 1925 recorded by KHALIL (1973), NEGM EL-DIN (1987) and ABU ELEEZ (1988) were detected from Synodontis schall. On the other hand many nematode parasites had been recorded and described from Synodontis schall and Bagrus bayad in Egypt. Cithariniella citharini reported by KHALIL (1964), IMAM (1971), FAHMY et al. (1976), EL-NAFFAR et al. (1983) and ABU-ELEEZ (1988) from Synodontis schall. Capillaria yamaguti, TADROS (1968), IMAM (1971); MORAVEC (1974) and NEGM EL-DIN (1987) and ABU ELEEZ (1988); Spinitectus allaeri MORAVEC (1974), NEGM EL-DIN (1987) and ABU ELEEZ (1988) and Procamallanus laeviconchus, WEDL (1862), IMAM (1971); SAHLABY (1982); NEGM EL-DIN (1987) and ABU ELEEZ (1988) were recorded from Bagrus bayad.

Accordingly, this investigation was achieved to throw the light on helminth enteric parsites which may infest Synodontis schall and Bagrus bayad collected from Beni-Suef water resources.

## MATERIAL and METHODS

92 and 39 fishes belonging to two genera Synodontis schall and Bagrus bayad respectively were collected during the present investigation from Beni-Suef markets from December, 1989 to June 1990.

Fishes were braught fresh or alive to the laboratory where they were autopsied and examined for the detection of enteric helminthes. Upon autopsy, fresh mature worms were washed in normal saline, then permanent mounts were satisfactorily obtained on using the lactophenol technique (CARLETON, 1967). The work is provided with microphotographs and measurements in mm.

## RESULTS

### [1]- Parasites from Synodontis schall :

**1.1.** Eumasenia aegyptiacus Mohamed, 1978:

The following description is based on 12 specimens (Fig. 1). The body was elongated covered with backwardly directed spines. It measured (0.780X0.320 mm). The oral sucker was cup shaped (0.085X0.092 mm). It was surrounded anteriorly by double rows of alternating spines. The ventral sucker was well developed, nearly oval in shape (0.752X0.661 mm). The prepharynx was short followed by the pharynx which was wider than long (0.028X0.37 mm). The oesophagus was short. The intestinal caeca were short, blind thin walled, wide and terminated nearly at the end of middle third of the fluke. The gonads were globular and located within the middle third of the body. The two testis were oblique, very close to each other. The anterior one (0.92X0.85 mm) while the post one (0.104X0.980 mm). The ovary was oval in shape (0.59X0.78 mm). The vitelline follicles were grouped in two lateral groups extending from acetabular level to testicular region. The uterus extended as a convoluted tube filling nearly the posterior half of the body and was filled with eggs which were small and oval.

**1.2.** Basidiodiscus ectorchis Fischthal and Kuntz, 1959:

It was one of the three trematodes recorded from Synodontis schall. The following description was based on 6 specimens (Fig. 2). The body (1.620X0.493 mm) with prominently circular wide posterior sucker (0.633X0.670 mm). The oral sucker is barrelshaped (0.182X0.163 mm) ending with the two lateral teat-like equal pharyngeal diverticula (0.082X0.69 mm) each. The oesophagus is wide but short extending till the anterior third of the organism, it bifurcates into two very short club-shaped intestinal caeca, ending in front of the posterior sucker level. The two testes are globular and nearly equal in size (0.232X0.211 mm and 0.221X0.216 mm) located obliquely one behind the other in the middle third of the worm.

The ovary appeared globular lying at the medium posterior aspect of the worm followed by the median uterine simple tube which usually seen filled with eggs. The vitelline glands of this fluke are few, fine extercaecal follicles and only limited at the extreme posterior quarter of the intestinal caeca. The eggs are elongated tapering from both ends.

**1.3.** Sandonia sudanesis McCllelland, 1957 (Fig. 3):

This other paramphistomid detected from Synodontis schall it exhibits nearly the same size (1.690X0.632 mm) but different contour by being oval in shape with tapering ends. The circular posterior sucker measures (0.621X0.552 mm). The oral sucker is also barrel-shaped with pharyngeal diverticula (0.181X0.132 mm). The oesophagus measures 0.310 mm but with terminal oval oesophgeal bulb (0.142X0.120 mm). The two testes are nearly equal globular (0.321X0.315 mm) each located obliquely one behind the other. The ovary is small (0.123X0.121 mm) located behind the testes, infront of which the convoluted uterine tube runs anteriorly between the two testes till the genital opening which is located nearly at the anterior end of the oesophageal bulb. The vitelline glands appear as larger globular follicles located only at the posterior halves of the intestinal caeca. The egg is elongated, oval with nearly developed embryo.

1.4. Wenyonia virilis Woodland, 1923:

It was one of the two cestodes recorded from the Synodontis schall. The mature worm measured (34.2X1.45 mm) (Figs. 4 & 5). There is no suckers, but the anterior portion representing the swollen fleshy hold fast (0.89X0.81 mm). The neck is very short while the body appears without any segmentation but with nearly parallel sides till the posterior moderately tapered-end which carries the excretory pore. The testes are numerous, appearing of various sizes (0.126 mm mean diameter), dark structure extending in the anterior fifth of the parenchyma between the excretory canals.

The ovary is of two equal triangular lobes (1.66X0.85 mm) located nearly at the junction between the second and third body fifths followed by the regularly convoluted median uterine tube which occupies nearly all the second fifth of the worm. The vitelline glands appear as very fine dust like granules distributed in the lateral fields in the whole second and third fifths. The genital pore was medially located at the junction between the first and second body fifths.

1.5. Monobothorioides species Fuhrmann and Baer, 1925:

It was the second cestode detected from Synodontis schall. The body was elongated (7.192X0.831 mm). The scolex (0.681X0.792 mm), carries numerous furrows of different directions and in certain stages of contractions. Behind the scolex there was a region devoid of gentalia, followed by the testicular region containing also the vitellaria which surrounded thetestes. The testes occupied the whole medullary parenchyma starting anteriorly behind vitellarial follicles and disappeared at the posterior end of the cirrus pouch. The testis measured (0.058 mm in diameter). The ovary occupied the posterior region of the worm, being formed of a number of follicles in the two lateral sides united together by commisures, nearly its posterior end forming the ovarian reservoir in coils beyond cirrus pouch and distended with eggs. Eggs were oval, non embryonated and measured 0.049X0.037 mm. (Figs. 6 & 7).

1.6. Cithariniella citharini Khalil, 1964:

The only nematode parasite recorded from Synodontis schall. Only the female worms was detected. It measured (3.931X0.260 mm). The oral opening was provided with three triangular lips. It leads to narrow vestibule (0.250 mm). The total length of the oesophagus was 0.498 mm. The oesophageal bulb was 0.089X0.089 mm, while the nerve ring commisure lies at a distance of 0.159 mm from the anterior end. The vulval opening was located in the posterior half of the body anterior to anus, at 2.889 mm from anterior end. The tubular gonads included double ovaries distributed in the opposite halves of the worm, uterine tube was seen filed with eggs. The tail region was long (0.678 mm) and narrow. Eggs were oval, thin shell with tapering poles, which characteristically carried fine filaments and measured (0.115X0.029 mm) (Figs. 8 & 9).

**[2] The enteric parasite worms detected in Bagrus bayad:**

**2.1.** Acanthostomum spiniceps Looss, 1896:

Handered of these flukes were collected during the present investigation. Its body measures (3.145X0.391 mm). The oral sucker (0.359X0.331 mm), has several spines 27(26-30). The venteral sucker was (0.162X0.199 mm). The length of pre-pharynx was 0.062 mm. The testes were tandum, where the anterior one was (0.192X 0.175 mm) while the posterior testis measured (0.186X0.199 mm). The ovary was infront of the anterior testis and measured (0.117X0.125 mm). The uterus filled the space limited by the ovary, ventral sucker and vitellaria. The genital pore was located immediately infront of ventral sucker. The mature egg was oval (0.029X0.021 mm). The vitellaria were follicular (Fig. 10).

**2.2.** Acanthostomum absconditum Looss, 1901:

It exhibited nearly the general shape and most of internal structural abnormalities of the previous fluke.

The body was elongated and cylindrical in shape (3.910X0.672 mm). The oral sucker was terminal, funnel shaped (0.321X0.279 mm around with 16-22 (18) pribuccal spines. The ventral sucker was almost rounded (0.152 mm). The prepharynx was 0.146 mm long. The pharynx was strongly muscular, oval in shape (0.101X0.121 mm). The oesophagus was very short (0.069 mm). The intestinal coeca extend behind the posterior testis ending with anal pore. The testis were tandum in position located near the posterior end of the body, where the anterior testis measured (0.229X0.221 mm) while the posterior one (0.249X0.231 mm).

The ovary was infront of the testis and measuring (0.132X0.122 mm). The genital pore was median in position infront of the ventral sucker. The vitelline glands extended laterally. The uterus filled the space limited by the ventral sucker, ovary and vitellaria. The intra-uterine eggs were yellow brown large measured (0.042X0.031 mm). (Fig. 11).

**2.3.** Haplorchoides cahirinus Looss, 1896:

The fluke was the smallest and commnest one metwith in Bagrus bayad. Its body is spiny of elongate club shaped (1.392X0.281 mm). The orl sucker is saddle like (0.051X0.055 mm) where the prepharynx is long (0.191 mm) and the pharynx is oval (0.046X0.040 mm). The oesophagus was short (0.068 mm). The intestinal coeca extended posterior to testis. The gonads were represented by the ovary, a single testis, seminal receptacle. The testis was large (0.139X0.128 mm) and situated at the middle of the body. The ovary was smooth. (0.089X0.078 mm) located infront of the testis. The uterus filled the whole area starting from the posterior end of the body and then passed anteriorly to open in common genital pore. The eggs were oval in shape (0.035X0.021 mm), pigment granules were scattered in parenchyma (Fig. 12).

2.4. Polyonchobothrium clarias Woodlands, 1925:

It was the only cestode detected in Bagrus bayad fish. The obtained specimens mesured 16.970 mm in length. The scolex was elongated, triangular measured (0.420X0.293) carried anteriorly one row (25 in number) hooks and beared two shallow bothria. No neck was detected and segmentation begain directly after scolex. All segments were broader than long. The immature segments were 31 in mean number with a mean size of 0.181X0.069 mm). The mature segments were 14 in mean number with a mean size of (0.205X0.132 mm). Each contained a single set of genitalia with a central oval shaped ovary measuring (0.055X0.038 mm) in mean size and dorsally situated small globular cirrus pouch. The testes were large, globular, smooth contoured 15 in mean number and occupied the inter excretory ducts space surrounding the ovary. The uterus was large, being posteriorly located. The gravid segments 17 in mean number with a mean size (0.199X0.363 mm). The later segments were empty and comparatively large. The uterus appeared as a round or oval sac occupying almost the whole bulk of the segment. The eggs varried in shape from spherical to subglobular with a thin shell containing well developed embryo (Figs. 13, 14 & 15).

2.5. Spinitectus allaeri: Campana-Rouget, 1961:

It was one of the small sized nematodes detected from Bagrus bayad fish. The only male worm was detected from B. bayad. The cuticle carried rings of minute spines. The spines and ringes were longer on anterior part of the body, but smaller on the posterior one. The male measures (2.81X0.79 mm). The length of the vestibule was 0.069 mm. The muscular oesophagus measured 0.171 mm, while the glandular part was 0.530 mm. The nerve ring was present at 0.078 mm from the anterior end. The posterior end of the body was provided with narrow alae. There were 4 pairs of preanal papillae and 5 pairs of post anal papillae. Spicules were unequal, the larger was slender (0.241 mm), while the smaller was wider (0.051 mm).

The tail was conical in shape (0.071 mm) (Fig. 16 & 17).

2.6. Capillaria vamaguti Tadros, 1986:

The followed description was based on 15 specimens collected from Bagrus bayad. The male approaching mean size of (4.321X0.042 mm) where female reached to (7.310X0.061 mm). The copulatory bursa seemed to be regularly triangular (0.019X 0.190mm). A single ensheathed spicule (0.281 mm). The testicular tube occupied nearly the anterior third of the posterior portion of the body of the worm before being directed posteriorly to share the cloacal room. In females, the ovarian tube nearly occupied the posterior fourth of the worm running foreward side by side with corresponding intestinal portion, where it was continued as a thin walled uterus which was usuall seen filled with eggs till vulva. Mature egg beside being double polarly pluged, appeared to have nearly flattened symmetrical lateral sides (Figs. 18, 19 & 20).

**2.7.** Procamallanus laeviconchus Wedl, 1862:

Larviparous spiruride nematode. The male only was detected from Bagrus bayad. Its body size (2.123X0.140 mm). The cuticle presented transverse annulations with regular intervals. Buccal capsule resembles that of strongylidae worms but with chitinized walls and quadripapillated wide oral opening. This was followed by oesophagus, the muscular part (0.238 mm) while the glandular part (0.394 mm). The tail appears short of only (0.031 mm) length preceeded by two unequal curved spicules. Just infront of the cloacal opening beside 8-10 pairs of precloacal, two pairs adanal and five pairs of post cloacal papillae (Figs. 21 & 22).

**2.8.** Rhabdochona aegyptiacus El-Naffar, 1974: (Figs. 23 & 24).

It was belonged to order spiruroidea. The male was only detected from Bagrus bayad. The male measured (6.309X0.118 mm). The vestibule was funnel shaped measuring 0.036X0.029. The prostom was supported by 7 longitudinal ridges. The muscular part of oesophagus 0.495 mm, while the glandular part was 1.663 mm in length. Nerve ring was located at a distance of 0.181 mm. from the anterior end. The male had two unequal spicules, the larger one measured 0.182 mm length, while the smaller one was 0.069 mm length. There are 10 pairs of preanal and 4 postanal papillae. The tail was curved ventrally.

## *DISCUSSION*

The present investigation aimed to determine the enteric parasitic helminthes which infest some Egyptian fresh water fishes namely Synodontis schall and Bagrus bayad in Beni-Suef water resources.

It was worthy to record that certain helminthes proved to be host specific like Eumasenia aegyptiacus, Basidiodiscus ectorchis, Sandonia sudanesis, Wenyonia virilis, Monobothrioides species and Cithariniella citharini. Such helminthes which were recorded to be found in Synodontis schall from various Egyptian localities, where previously recorded from the same host in other localities in Egypt (MOHAMED, 1978; FISCHTHAL and KUNTZ,1959; McCLLELLAND,1957; WOODLAND,1923; FUHRMANN & BAER, 1925 and KHALIL, 1964).

Concerning the different types of helminth parasites obtained from Bagrus bayad, it was evident that Bagrus bayad proved to be specific host to Acanthostomum spiniceps, Acanthostomum absconditum, Haplorchoides cahirinus, Spinitectus allaeri Capillaria yamaguti, and Procamallanus laeviconchus, where all the previous mentioned worms were detected in other localities than Beni-Suef in Bagrus bayad (LOOSS,

1896; LOOSS, 1901; CAMPAN ROUGET, 1961; TADROS 1968 and IMAM, 1971).

It was also of interest in the present investigation to record the cestode, Polyonchobothrium clarias (WOODLAND, 1925) for the first time from Bagrus bayad in Beni-Suef, while it was previously detected in Clarias lazera by many authors (TADROS, 1966; IMAM, 1971 and ABU ELEZZ, 1988).

At the same time Rhabdochona aegyptiacus is recorded for the first time from Bagrus bayad in our investigation, while was previously detected and described by EL-NAFFAR (1974) from Anguilla vulgaris and Barbus bynni from Assiut Governorate. FAHMY et al. (1976) recorded the same parasite from Anguilla vulgaris from thesame locaity. So in this investigation, Polyonchobothrium clarias and Rhabdochona paegyptiacus were recorded for the first time from Bagrus bayad considering it as new hosts and new locality records.

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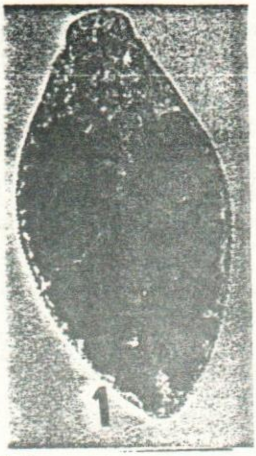


Fig.(1): Eumasenia aegyptiacus X 40

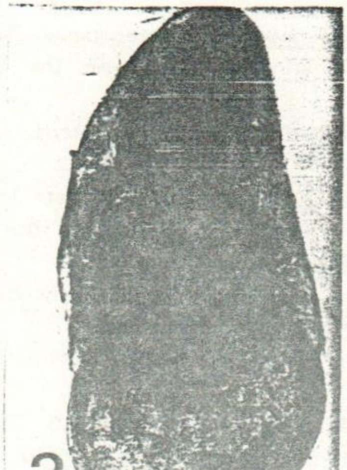


Fig.(2): Basidiodiscus ectorchis X 40

Fig.(4): Wenyonia virilis Anterior end X 40

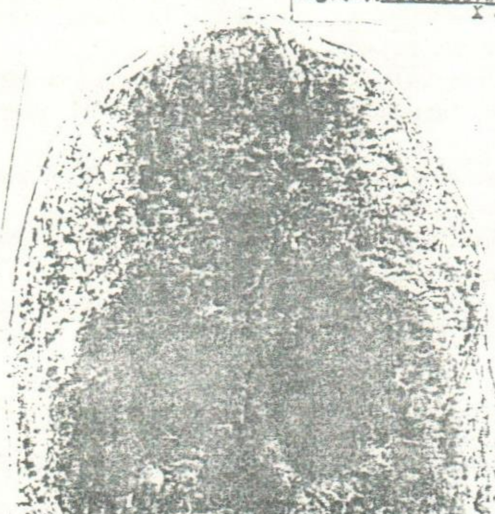


Fig.(3): Sandonia sudanesis X 100

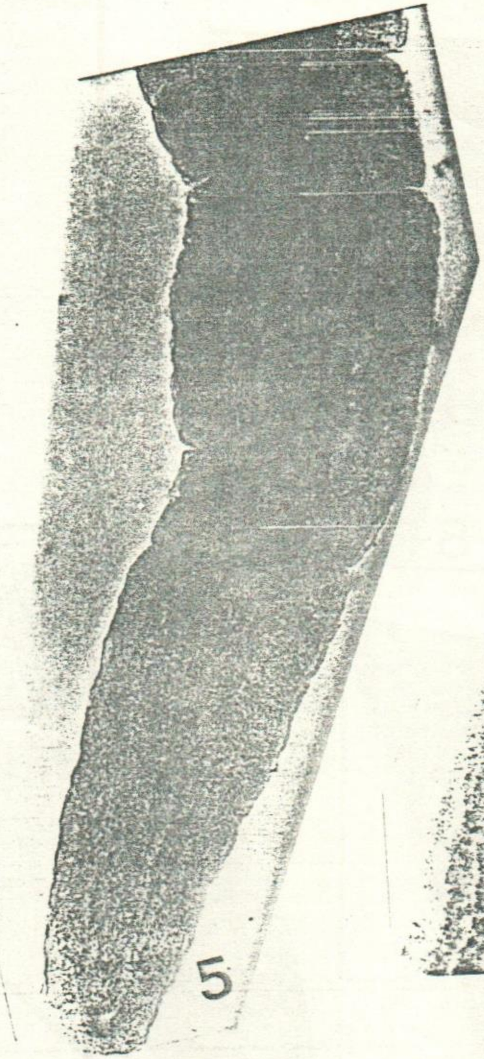


Fig.(5): *Wenyonia virilis*
Posterior end X 40

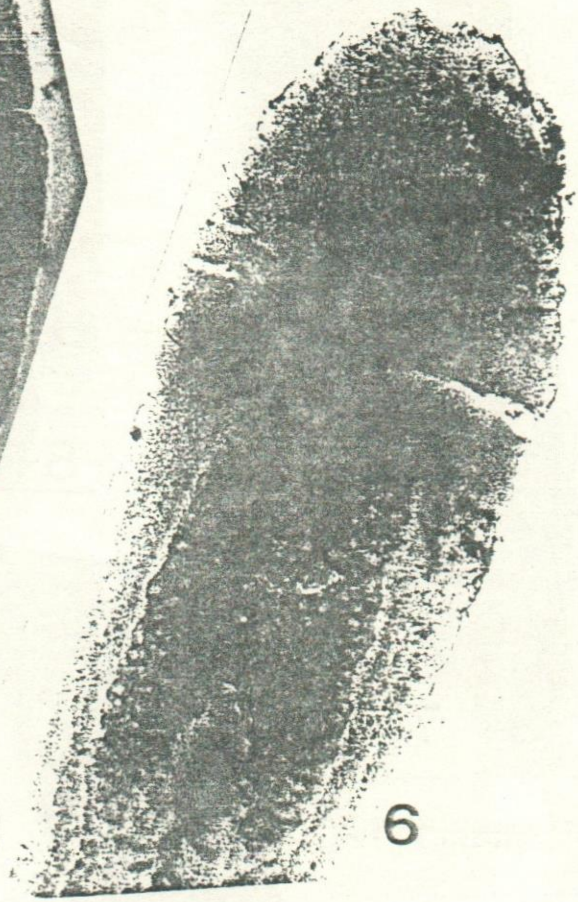


Fig.(6): *Monobothrioides* sp.
Anterior end X 40


Fig.(7) Monobothrioides sp. Posterior end X40

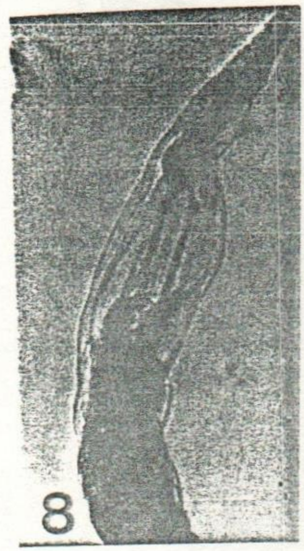



Fig.(8): Citharini-ella citharini X 40 Anterior end


Fig.(9): Citheriniella -Female Post.end X 40

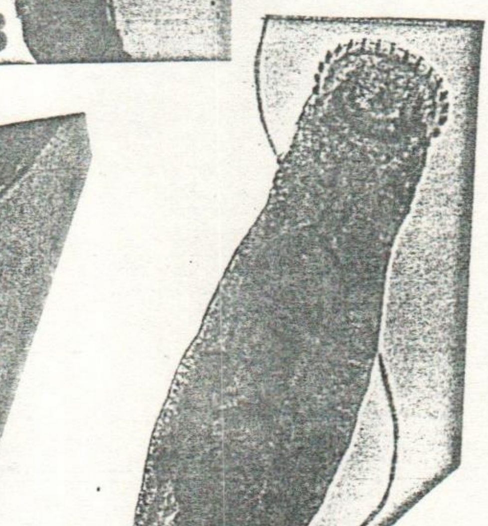



Fig.(10): Acanthostomum spiniceps X 40

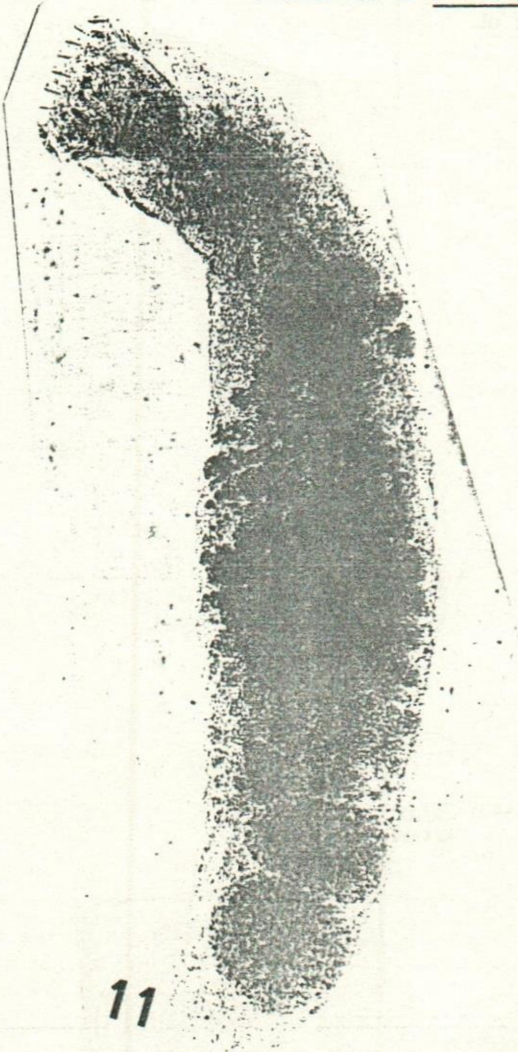



Fig.(11):A.absconditum X 100

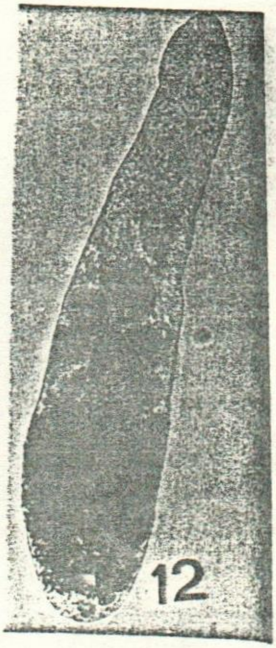



Fig.(12):Haplorchoides cahirinus X 40

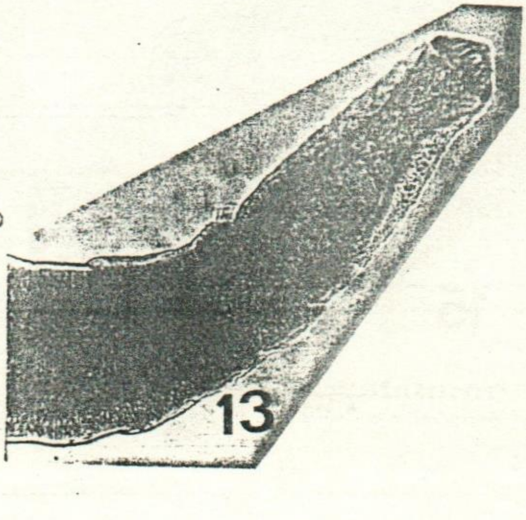



Fig.(13):Polyonchobothrium cl. clarias X 100

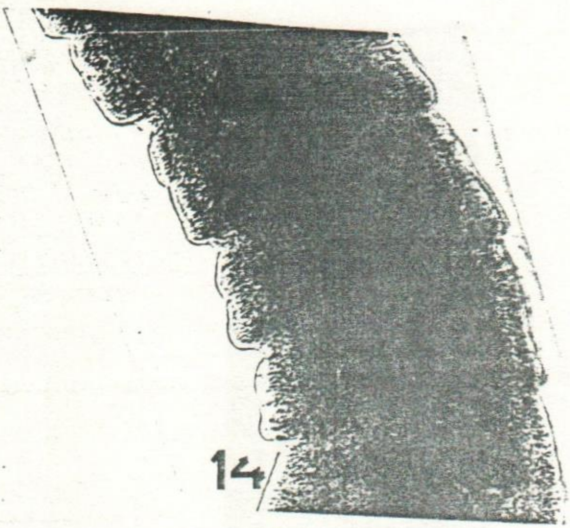


Fig.(14):P. clarias ,Mature segm. X 100

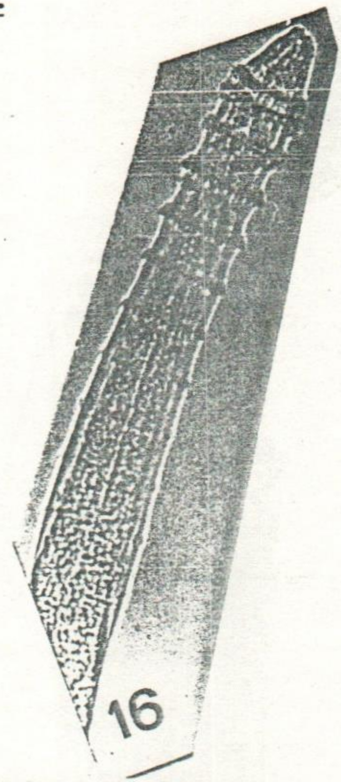
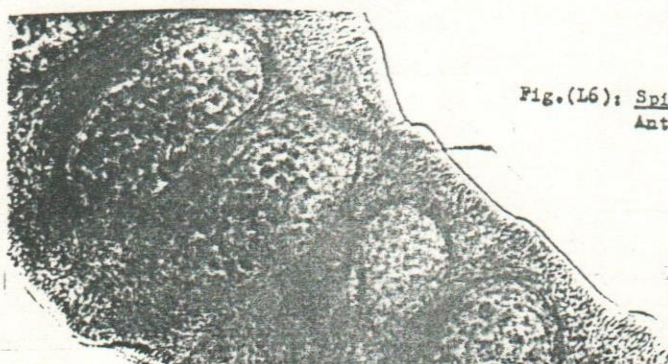


Fig.(L6): Spinitectus allaeri Anterior end X 100



PFig.(15):P.clarias. Gr.segm. X 100

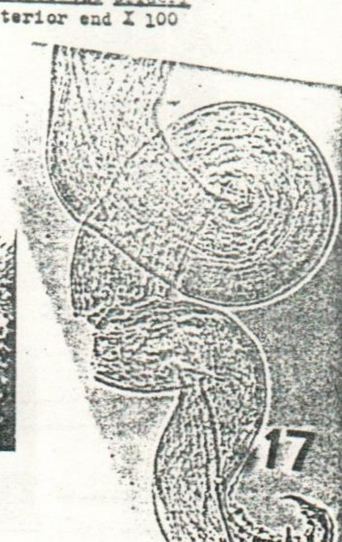


Fig.(17):S.allaeri , Male posterior end X 100

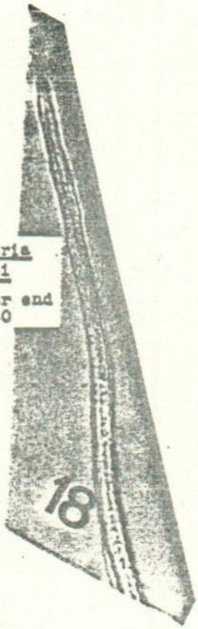


Fig.(18): Capillaria yamaguti
Anterior end X 40

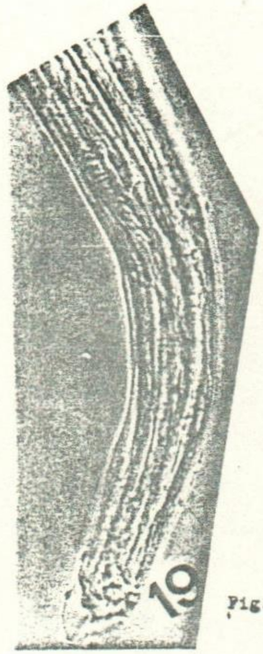


Fig.(19): C. yamaguti
Male post.end X 100

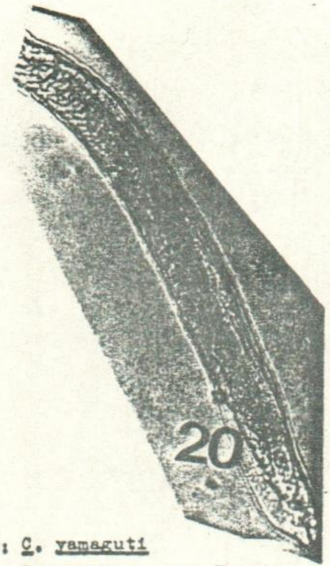


Fig.(20): C. yamaguti
Female post. end X 100

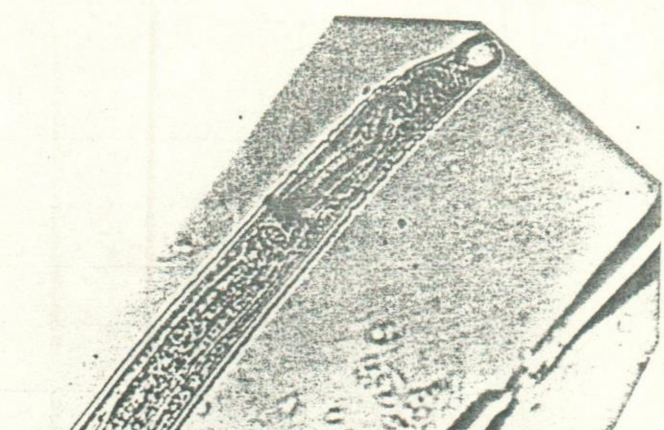


Fig.(21): Procamallanus laeviconchus
Anterior end X 100

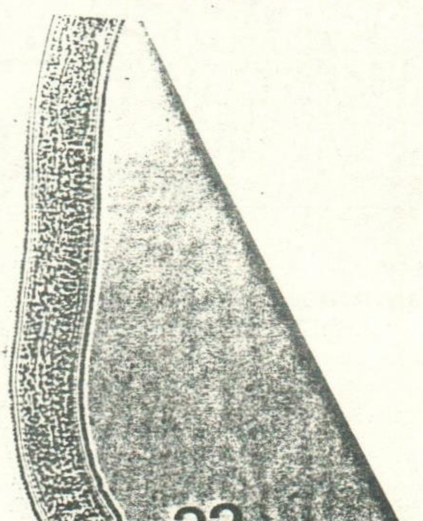


Fig.(22): P.laeviconchus
Male posterior end X 100



Fig.(23): Rhabdochona aegyptiacus
Anterior end X 400

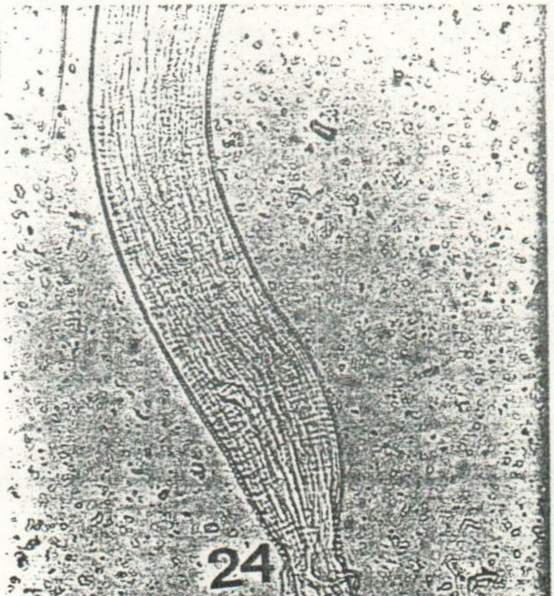




Fig.(24): R.aegyptiacus
Male posterior end
X 100

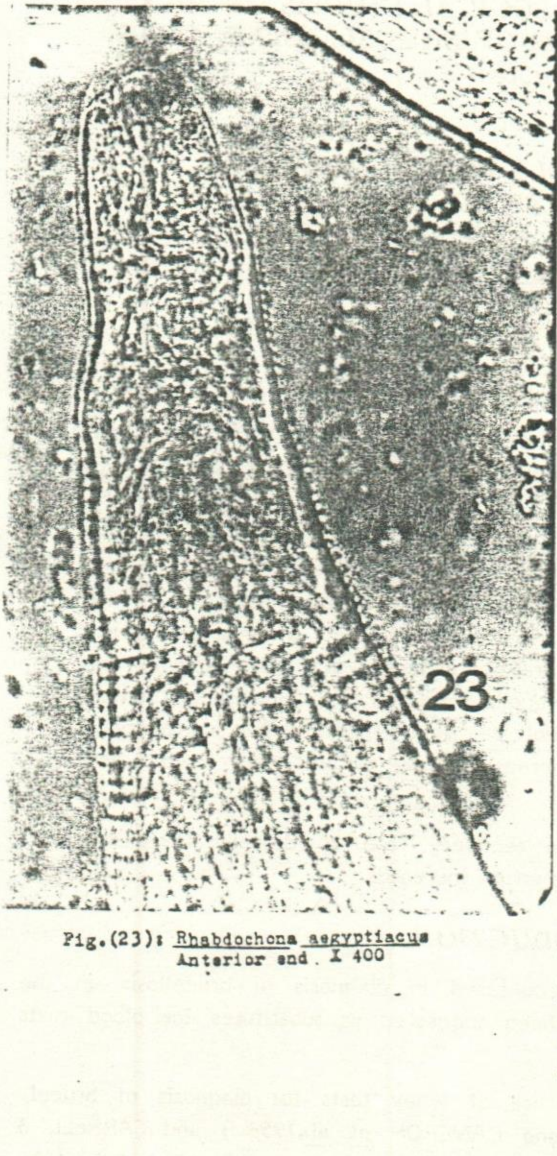



Fig.(23): Rhabdochona aegyptiacus
Anterior end. X 400

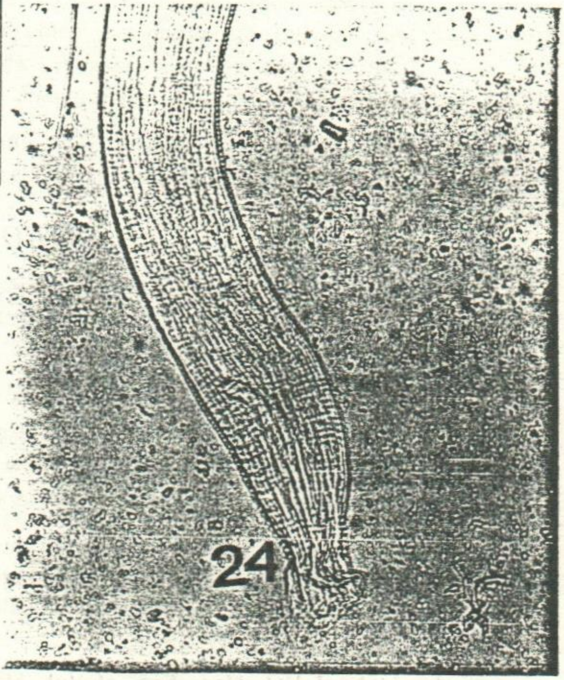



Fig.(24): R.aegyptiacus
Male posterior end
X 100