

معهد بحوث صحة الحيوان •

معمل بيظري سـوهاج •

رئيس المعمل: د • فوزي أحمد عبدالسلام •

بعض الدراسات على طفيل الميئاسركاريا المتحوصل في

أسماك الشلبه النيلبي بمحافظة سـوهاج

٢- العدوى التجريبية لصغار الكتاكيت بواسطة الميئاسركاريا المتحوصلة الحية

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طفيل الميئاسركاريا متواجد في أسماك الشلبه النيلبي بصورة حية قد تم عزله منها •

الاسماك ذات اصابات متوسطة وعالية متواجدة في محافظة سـوهاج •

هذه الطفيليات قد مرت بعدة مراحل لاثبات مدى قوة حيويتها وأختير عدد مناسب منها للاستخدام في العدوى التجريبية لصغار الكتاكيت في عمر يوم • كانت نسبة الطفيليات اليافعة المعزولة ٤٢٢% • تم عزل نوعين من هذه الديدان التي تنتمي لعائلة الديدان المفلطحة عزلت من الغشاء المخاطي المبطن للامعاء بعد أسبوعين من العدوى التجريبية، النوع الأول هو بروهيسطومم فيفاكس والنوع الثاني هو ستاكتودورا تراديكتي كلا •

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**SOME STUDIES ON METACERCARIAL INFECTION IN SCHILBE
MYSTIS FRESH WATER NILE FISH AT SOHAG PROVINCE, EGYPT
EXPERIMENTAL INFECTION OF NEWLY HATCHED CHICKS FEED
WITH VIABLE METACERCARIAE OF STICTODORA TRIDACTYLA
MARTIN & KUNTZ, 1955 AND PROHEMISTOMUM VIVAX SONSINO, 1892
(With 2 Tables & 2 Plate)**

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SUMMARY

Isolated viable metacercariae were collected from a heavy and moderate infected Schilbe mystis at Sohag Province. These metacercarial cysts were submitted to prove the viability and the infectivity power. Constant number of viable metacercariae were fed to one day old chicks. The recovery rate was 4.22%. Two types of digenetic trematodes were recovered that only isolated from the intestinal mucosa two weeks post infection. The first type is Stictodora tridactyla MARTIN & KUNTZ, 1955 and the second type is Prohemistomum vivax SONSINO, 1892.

INTRODUCTION

Larval parasitic fish infection to day has played a specific role in fish tissues (MAHMOUD, 1983) that hyper infection may cause functional damage when the active tissue was displaced by the encysted parasite (JOHN, 1966) and (HAN PAPERNA, 1980). It will be obvious that these parasites in fresh water Nile fish are more important than the parasites which are merely attached to the fish surface (HAN PAPERNA, 1980). Fish food consumers have expressed much hazards upon eating larval digenetic stages in the musculature of several food fishes caught in local waters. Public health interest among these parasites localized in tissues yields to clear the role played by these types of Nile fish in transmitting parasitic diseases through possibilities of infection to human, animals and birds.

Our studies Schilbe mystis fresh water Nile fish a common species in markets of Sohag Province proved to be heavily infected with metacercariae of unknown trematodes, MAHMOUD, et al. (1987). Our aim in the present work is to infect chickens by feeding them on encysted metacercariae to recover the adult worms.

MATERIAL and METHODS

A total of 70% fresh heavily and moderately infected Schilbe mystis fish was collected from Sohag Province markets looking for viable metacercarial cysts. The viable metacercariae isolated from tissues and organs were recovered by compression technique (MORISHITA, et al.

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1965) then submitted again to the digestive technique to recover the motility and viability (HAN PAPERNA, 1980). The highly active metacercariae were fed to new hatchery one day old chicks at a rate of 100 metacercariae per chick. Faecal examination was done using sedimentation technique from samples of 12 chicks (9 chicks used in experiments and 3 chicks served as control fed with parasite free ration). Eggs released in faecal samples were recovered two weeks post infection. The eggs were fixed with formol-saline 10% and measured. The chicks were immediately sacrificed and the adult digenic trematodes were recovered by intestinal mucosal membrane scraping (SOULSBY, 1982). Recovered digenic trematodes were fixed with formol-saline 10%, then stained with acid alum carmine, identified and drawn with the aid of a camera lucida.

RESULTS

According to data shown in (Table 1,2) two types of experimentally isolated digenic trematodes were identified according to YAMAGUTI (1958).

- 1- Stictodora tridactyla MARTIN & KUNTZ, 1955, Plate 2
- 2- Prohemistomum vivax SONSINO, 1892, Plate 1.

Family	Heterophyidae	ODHNER, 1914
Sub-family	Stictodorinae	
Genus	Stictodora	LOOSS, 1899
Species	<u>Stictodora tridactyla</u>	MARTIN & KUNTZ, 1955

Generic diagnosis:

Body small, flattened, pear or club shaped, spinose, oral sucker subterminal, Prepharynx conspicuous, oesophagus usually short, ceca reaching near posterior extremity, Acetabulum embedded in parenchyma, modified into non suckorial organ with numerous spines projecting into genital atrium. Testes usually oblique, sometimes nearly symmetrical in anterior or middle part of hind body. No cirrus pouch, vesicular seminalis constricted into 2 to 4 portions. Pars prostatica present. Ductus ejaculators very short, opening into genital atrium along with metraterm. Genetal atrium relatively wide enclosing acetabulum opening in more or less submedian line, some distance behind intestinal bifurcation. Ovary in front of posterior testis. Receptaculum seminis and Laurer's canal present. Uterus occupying most of pre-inter and post testicular regions. Eggs thick shelled, small vitellaria lateral or dorsal in posterior part of hind body. Excretory vesicle Y shaped, funnel shaped when distended. Parasitic in intestine of birds and mammals.

Family	Cyathocotylidae	POCH, 1926
Sub-family	Prohemistominae	LUTZ, 1935
Genus	Prohemistomum	ODHNER, 1913
Species	<u>P. vivax</u>	SONSINO, 1892

Generic diagnosis:

Body not bipartite, oval with deep ventral pouch, in which comparatively small tribocytic organ with median slit is situated at middle of body. No dorso terminal appendage. Acetabulum well developed, genital pore sub-terminal. Ovary sub-median or lateral in zone of anterior testis. Vitelline follicles fairly large, confined to post acetabular region lateral and posterior to tribocytic organ. Parasitic in Raptatores, experimentally in cats and dogs. Genotype, Prohemistomum vivax SONSINO, 1892.

The prepatent period was found to be two weeks post infection with metacercariae.

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DISCUSSION

I - Stictodora tridactyla MARTIN & KUNTZ, 1955.

In the present work the prepatent period is more or less similar to that recorded by FAHMY, et al. (1976) who fed puppies and kittens with metacercariae. These findings indicate that the prepatent period is the same in different hosts. The adult trematodes recovered coincides with the findings of FAHMY, et al. (1976). Accordingly the change of different hosts did not affect the morphological characters of the worms. The identification was done according to systematic diagnosis by YAMAGUTI (1958). The recovery rate in the present study was (1.77%). Which is lesser than the recovery rate in case of P.vivax. Accordingly to the available literature it appears that this is the first record of Stictodora tridactyla in Sohag (Upper Egypt), since MARTIN & KUNTZ (1955) recorded it in lower Egypt. In addition Sohag is considered as a new locality for this parasite.

In the present study S.tridactyla is isolated from infected newly hatched one day old chicks two weeks post infection. This parasite which was isolated from Schilbe mystis coincides with the parasite morphologically studied by MARTIN & KUNTZ (1955) which was isolated from chicks experimentally fed on Gambusia affinis tissues which has been infected by biocellate monostomate and parapleurolophocercus cercariae released from Pirenella conica snails at the northeastern shore of lake Burullus. From the previous studies, the Public health importance of this parasite is similar to heterophyid species in that it is of low specificity to the host and is easily transmissible to man (MARTIN & KUNTZ, 1955) and (HAN PAPERNA, 1980).

II - Prohemistomum vivax SONSINO, 1892

In the present work the prepatent period is more or less similar to that recorded by FAHMY, et al. (1976) who fed puppies and kittens with metacercariae. These findings indicate that the prepatent period is the same in different hosts. The adult trematodes recovered coincides with the findings of FAHMY, et al. (1976). Accordingly the change of different hosts did not affect the morphological characters of the worms. The identification was done according to systematic diagnosis by YAMAGUTI (1958). The recovery rate in the present study (2.44%) is lesser than the recovery rate (8.27%) recorded by MAHMOUD (1983) who fed the metacercariae to cats and dogs. This indicates that the cats and dogs are the naturally suitable hosts than chicks which are not fish eaters. In addition the parasite may need more acidic fluid to grow well to the mature stage as the case with dogs and cats. Human beings may be susceptible in the same way as dogs and cats. However, human beings do not feed on raw fishes, that is why the incidence appears to be very low in human beings.

In the present study, P.vivax is isolated from infected newly hatched chicks two weeks post infection. This parasite morphologically coincides with the morphological characters of the parasites isolated from dogs and cats fed on different fish species (Tilapia nilotica, T.zilli, Moryrus kannume, Schilbe mystis, Clarias lazera, Hydrocyon forskali and Alestes nurse) collected from Cairo markets (MAHMOUD, 1983). The parasite appears to have a public health significance as explained by NASR (1941) who isolated the parasite from the small intestine of man.

In new localities as Sohag province, the present authors could isolate this parasite from experimentally infected newly hatched chicks. The ecology of this parasite was studied by FAHMY, et al. (1976) who found that Cleopatera bulimoides snail was a usual intermediate host for P.vivax since it released Cercaria vivax which encyst in the tissues of the fresh water fish in Upper Egypt.

F.A. ABD EL-SALAM, et al.**REFERENCES**

- Fahmy, M.A.M.; Mandour, A.M. and El-Naffar, M.K. (1976): Successful infections of dogs and cats by Prohemistomum vivax Sonsino, 1892 and Haplorchis yokogawai Katsuta, 1932. J. Egypt. Soc. Parasit., 6: 77-82.
- Han Paperna, H.S. (1980): Parasitic infections and diseases of fish in Africa F.A.O. CIFA. Technical paper, 7: 51-62.
- John, D.S. (1966): Fish and fish inspection. 2nd edition, H.K. Lewis and Co- Ltd University press. London.
- Mahmoud, N.A.M. (1983): Parasitic infestations of some Native species of fishes in Cairo markets with special reference to parasites transmissible to man and animals. Thesis presented for the degree of M.V.Sc. Cairo University.
- Mahmoud, N.A.M.; F.A. Abd El-Salam and A.F. Abd El-Gawad (1987): Incidence and morphological characters for Metacercarial infection (in press).
- Martin, W.E. and Kuntz, R.E. (1955): Some Egyptian Heterophyid trematodes. J. Parasit., 41: 4: 374-382.
- Morishita, K.; Komiya, Y. and Matsubayashi, M. (1965): Progress of Medical Parasitology in Japan. Vol. I, Vol. II, Maguro Parasitological Museum, Tokyo.
- Nasr, M. (1941): The Occurance of Prohemistomum vivax infections in man with redescription of the parasite. Lab. and Med. Prog. 2: 135-149.
- Soulsby, E.J.L. (1982): Helminths, Arthropods and Protozoa of domesticated animals. 7th Ed. The English book society and Beilliere Tindall, London.
- Yamaguti, S. (1958): Systema Helminthum. The digenetic trematodes of Vertebrates. Part 1, Inter science Publishers. Inc., New York, Part V, 865-951.

METACERCARIA IN SCHILBE MYSTIS

Table (1)
Average measurements in millimeters for adults recovered from newly hatchery chicks

Digenetic species	Body		Oral Sucker		Ventral Sucker		Pharynx		Eophagus		Testis		Ovary		Seminal Vesicle	
	L	W	L	W	L	W	L	W	L	W	L	W	L	W	L	W
1- Prohemistomum vivax Eggs ⁺	1.057	0.60	0.090	0.075	0.060	0.045	0.075	0.045	0.045	0.045	0.110	0.075	0.750	0.060	0.360	0.075
2- Stictodora tridactyla Eggs ⁺⁺	0.330	0.160	0.030	0.030	0.031	0.016	0.024	0.017	0.022	0.017	0.051	0.045	0.043	0.032		

⁺ Eggs (0.207 - 0.066) Oval in shape, yellow in colour, large in size, Operculated.
⁺⁺ Eggs (0.024 - 0.014) Oval in shape, yellow in colour, small in size, Operculated.
 L = Length
 W = Weidth

Table (2)
Experimental feeding of isolated viable metacercariae to newly hatched one day old chicks

Fish species	Number of infected chicks	Number of control free chicks	Single dose cyst./chick	Total No. of worms recovered	Total recovery rate (Mean)	Species of worm recovered			
						P. ivax No.	Re. rate	S. trido No.	
	Chick No.							Re. rate	
<u>Schilbe mystis</u>	1		100	5	5	3	3	2	2
"	2		100	4	4	2	2	2	2
"	3		100	2	2	2	2	0	0
"	4		100	3	3	2	2	1	1
"	5		100	3	3	3	3	0	0
"	6		100	8	8	5	5	3	3
"	7		100	3	3	2	2	1	1
"	8		100	6	6	1	1	5	5
"	9		100	4	4	2	2	2	2
Total	9	3	900	38	4.22	22	2.44	16	1.77

No. Number
Re. rate: Recovery rate.

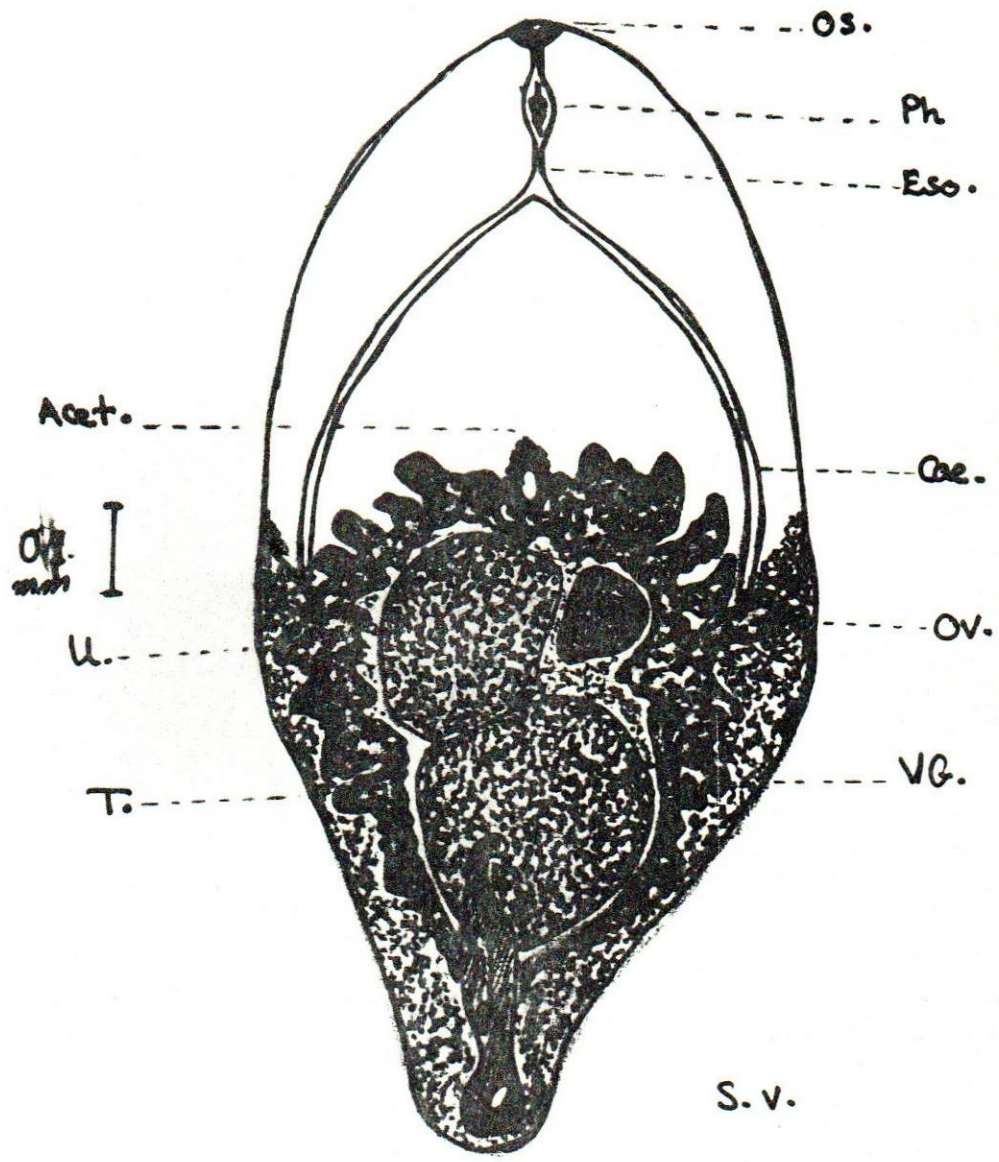


Plate (1): *Prohemistomum vivax* (Sonsino 1892)

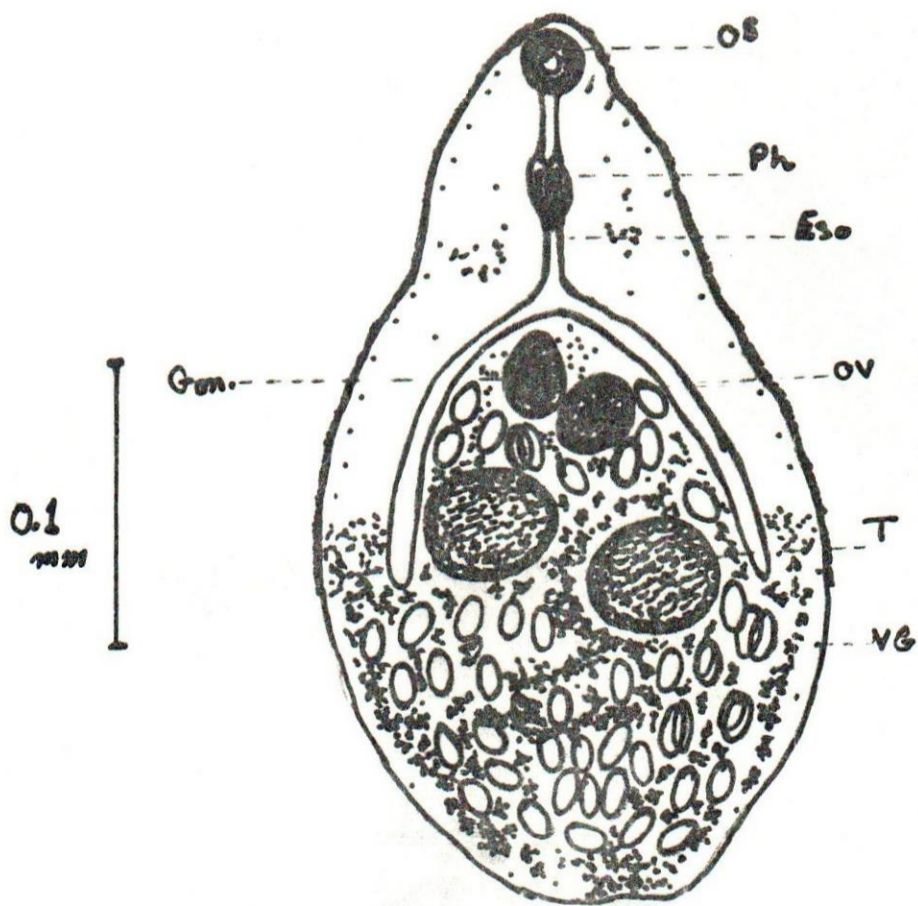


Plate (2): *Stictodora tridactyla* (Martin & Kuntz, 1955)