

قسم : الطفيليات والميكروبيولوجيا - كلية الطب - جامعة أسيوط
رئيس القسم : أ.د / عماد كامل نافع

دراسة على السركاريا التي قد توجد فى قوقع ميلانا تيويركيولاتا
أ . دراسة على سركاريا تاحة لجنس الايوميجاسيتس

عاطف سكللا ، رفعت خليفة

لاحظ الباحثان خروج نوع من سركاريا الدايتوم من قوقعى ميلانا تيويركيولاتا ، وفيفييارا يونيكولور فى مدينة أسيوط . وقد وجد أن السركاريا تتكون داخل سبورسستات توجد قرب مؤخرة جسم القوقع . كما لوحظ وجود اصابة مختلطة فى قوقع الميلانيا حيث وجدت سركاريا هابلوركسس بوميليو (التى تتكون داخل ريدات) مختلطة مع السركاريا الحالية . هذا وقد وصف الباحثان السركاريا والسبوروسيست وصفا تفصيليا ، ومقارنة السركاريا بما تم كشف النقاب عنه من أنواع التريماتودا بمحافظة أسيوط اقترح الباحثان ان تكون هذه السركاريا هى الطور اليرقى لسدودة الايوميجاسيتس (ايوميجاسيتس) سباينوزس التى وصفها الأستاذ الدكتور محفوظ عبد المجيد فهمى وآخرين عام ١٩٨١ .

STUDIES ON CERCARIAE FROM MELANIA TUBERCULATA SNAIL IN ASSIUT GOVERNORATE
1. ON A CERCARIA BELONGING TO EUMEGACETES SP.

(With 4 Figures & One Table)

By

A.A. SAKLA and R. KHALIFA

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SUMMARY

Distome cercariae were found to emerge from naturally infected Melania tuberculata and Vivipara unicolor snails in Assiut city. Cercariae develop in sporocysts. Mixed infection with cercaria of Haplorchis pumilio was noticed in Melania tuberculata snail. The cercaria and sporocysts were fully described and compared form previously reported ones. By analogy of adult and metacercarial stages of trematodes recorded in Assiut city, it was suggested that the present cercaria might be the larval stage of Eumegacetes (Eumegacetes) spinosus Fahmy, Khalifa and Abdel-Rahman, 1981.

INTRODUCTION

OMRAN (1973) started the research work on larval stages of trematodes in fresh water snails in Assiut. However, she-with few exceptions-has never related any of her cercariae to their adults. This aim was fulfilled later on by many authors. thus the life cycle of Haplorchis pumilio, Paramonostomum aegyptiacum, Lecithodendrium granulatum and Euclinostomum ardeolae sp. nov., were fulfilled by KHALIFA et al. (1977), KHALIFA and EL-NAFFAR (1978), EL-NAFFAR et al. (1979) and EL-NAFFAR and KHALIFA (1981). Later on, the cercariae of Haplorchis yokogawai and H. taichui were identified and related to their adults by FAHMY et al. (in press). The present work is considered to be a continuation of this series of work where a distome cercaria is to be studied and related to its adults.

MATERIAL and METHODS

Snails were collected from the fresh water drains and lakes of Assiut city. Cercariae were let to emerge spontaneously from the infected snails. Cercariae were examined in the living state for behaviour. Detailed studies were done by supervitally staining the cercariae in weak solutions of Nile blue and neutral red. Cercariae were also stained in acetic acid alum carmine and mounted in Canada balsam. Measurements were taken from 20 specimens killed by moist heat. All drawings were done by camera lucida. Sporocysts were described from fresh specimens obtained by crushing of the infected snails.

RESULTS

The cercaria was found to emerge from the fresh water operculated snails Melania tuberculata and Vivipara unicolor. Infection in the first snail was mixed with cercariae of Haplorchis pumilio. The infection in the second snail was not very pronounced as shown by the lower number of the emerging cercariae.

Behaviour:

Cercariae get out from the infected snails in swarms and periodically, usually in the morning. They are moderately active swimmers with frequent resting periods. Resting position is indicated by relaxation of both body and tail and slight ventral flexion of the anterior end of the body. The cercariae swim homogeneously in the infected water, but they are usually more concentrated towards the more lighted side of the container. Life span of the cercariae is two and half to three days at room temperature 15-20°C.

Morphology:

Living cercariae are greyish white in colour. The body is roughly oval in shape. The integument is thick and covered with sharp spines which are homogeneously distributed. The outer wall is also carrying ten pairs of papillae, each is armed with long seta (Fig. A). The body is 315-360 U in length (average 99 U). The distome

cercaria carries more or less equal oral and ventral suckers. The oral sucker is subterminal spherical in outline and has a diameter of 31.2-42.9 U (average 38.22 U). Ventral sucker is pre-equatorial and is well developed. It is spherical in outline with a diameter of 39-42.9 U (average 40.25 U). Cercaria is apharyngeal. Alimentary tract could not be traced. Excretory vesicle is long, Y-shaped with its upper limbs surrounding the posterior margin of the ventral sucker. The stem of the bladder measures 97.5-109.2 U (average 104.52 U) in length and 9.75-13.65 U (average 10.45 U) in width. Other parts of the excretory system could not be traced due to the thick integument surrounding the body. Genital primordium is in the form of a follicular mass just anterior to the ventral sucker and partly covering its anterior border. A tail like process gets out from this mass and passes backwards to end somewhere posterior to the sucker (Fig. A). It gradually tapers into a sharp point. The body contains thirteen pairs of penetration glands arranged in three groups; two groups are located anterior to the ventral sucker, three pairs medial, and five pairs lateral. The third group (five pairs) lies posterior to the ventral sucker near the lateral wall. Ducts of the three groups open separately near the tip of body around the anterior margin of the oral sucker. Distribution of the ducts and openings is shown in (Fig. B). Cystogenous glands could be seen all over the body but they are more pronounced in the posterior half of the body. The tail is straight, tapering and is covered by minute spines. It is attached to the ventral surface of the body and is locked there in a special socket. The tail measures 255-300 U (average 279 U) in length and 30-45 U (average 39 U) in maximum width.

Table (1): Comparison between *C. assiutis* Omran (1973) and the present cercaria

	<u>Cercaria assiutis</u> n. sp. Omran (1973)	Present material
Colour of cercaria	Yellowish	whitish grey
Body length	230 - 240 U	315 - 360 U (av. 336 U)
Body breadth	100 - 110 U	90 - 105 U (av. 99 U)
Tail length	230 - 240 U	225 - 300 U (av. 279 U)
Tail breadth	40 U	30 - 45 (av. 39 U)
Integument	not mentioned	covered with spines, 10 pairs of papillae and setae
O.S. diameter	30 - 33 U	31.2 - 42.9 (av. 38.22 U)
V.S. diameter	30 - 33 U	39 - 42.9 (av. 40.25 U)
Penetration gl.	not observed	13 pairs in three groups
Genital primordium.	In the form of 2 rounded masses (only in drawing)	In the form of one mass with a tail like process.
Attraction to light	not attracted	Attracted
Life span	12 hours	2½ - 3 days
Host.	<u>Melania tuberculata</u>	<u>Melania tuberculata</u> and <u>Vivipara unicolor</u>
Locality	Assiut, Upper Egypt	Assiut, Upper Egypt

Cercariae were noticed not to encyst on glass of the container or on floating plant leaves or on the shell of the snails.

Sporocysts:

Few sporocyst could be found in the infected *Vivipara* snail. Plenty of sporocysts mixed with rediae of *Haplorchis pumilio* were found in the infected *Melania* snail. Rediae of *H. pumilio* are cylindrical in outline, about 1-1.5 mm in length and 150-180 U in breadth. Oral sucker is prominent and spherical in outline (Fig. C) measuring about 60 U in diameter. Birth pore could be seen near the junction of the thin anterior part with

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the thick posterior part. Sporocysts of the present cercaria was found to be very long and divided into parts engorged with cercariae. It was noticed that cercariae get out from the sporocyst by their tails in advance (Fig. D).

DISCUSSION

EL-GINDY and HANNA (1963) described some larval trematodes from Melania tuberculata snail collected from different provinces of Lower Egypt, but they had not mentioned any cercaria similar to the present material. However, OMRAN (1973) in her study of the fauna of fresh water snails in Assiut Governorate, described Cercaria assiutis as a new species inhabiting Melania tuberculata snail. The present cercaria bears a superficial resemblance to C. assiutis OMRAN (1973), but they differ in many morphological and biological features (Table 1). They differ in colour, relative measurements, shape of genital primordium and the presence of penetration glands. The description of OMRAN (1973) lacked many details particularly in relation with integumental appendages, penetration glands and cystogenous glands. Also, it is noticed in the text, particularly in relation to the suckers which were mentioned to be spherical and equal in size, while in the camera lucida drawing, they appear to be unequal and ovoidal in outline. Moreover, OMRAN (1973) compared her material with un-named cercaria described by NAKAGAWA (1915). These two cercariae should not be compared with each other as cercaria of NAKAGAWA develops in redia, while OMRAN's material develop in sporocysts. Moreover, OMRAN (1973) stated that "the absence of penetration glands may indicate that the cercaria should encyst on something different from plants", while if the cercariae were really lacking penetration glands, they should rather encyst on plants or shells of the same or other snails.

The present cercaria is therefore quite different from C. assiutis OMRAN (1973), although they seem to belong to adults of the same family. By analogy with the adult and metacercarial stages described from Assiut, the present cercaria might be the larval stage of one of the three species of genus Eumegacetes described from Assiut region by EL-NAFFAR and KHALIFA (1980), and FAHMY *et al.* (1981). Actually, the present cercaria bears a great resemblance to the metacercaria of E. artamii recorded by SINGH and PANDE (1968). The present authors suggest the present cercaria to be the larval stage of Eumegacetes (E.) spinosus described by FAHMY *et al.* (1981), because of the presence of spiny integument in both cercariae and adults; a character which was described for the first time in E. (E.) spinosus. Moreover, the present author believe that C. assiutis OMRAN, (1973) to be the larval stage of another species of Eumegacetes.

REFERENCES

- El-Gindy, M.S. and Hanna, F.Y. (1963): Larval trematodes from snails Pirenella conica and Melania tuberculata with special reference to heterophyiasis. Bull. End. Diseases, Iraq, 5, 33-58.
- El-Naffar, M.K.; Khalifa, R. and Abdel-Rhman, A.M. (1979): The life cycle of Lecithodendrium granulatum Looss, 1907, with detailed study of its morphology. J. Egypt. Soc. Parasit. 9, 311-321.
- El-Naffar, M.K. and Khalifa, R. (1980): On two new species of Eumegacetidae Travassos, 1923, (Trematoda) from wild birds in Assiut Province, Egypt. J. Egypt. Soc. Parasit. 10, 161-168.
- (1981):
Euclinostomum ardeolae sp. nov. (Trematoda: clinostomatidae). J. Egypt. Soc. Parasit., 11, 175-181.
- Fahmy, M.A.M.; Khalifa, R. and Abdel-Rahman, A.M. (1981): Eumegacetes (Eumegacetes) spinosus n. sp. (Eumegacetidae: Trematoda) from the little green Egyptian bee-eater, Merops orientalis cleopatra. Assiut Vet. Med. J., 8, 79-81.
- Fahmy, M.A.M.; Khalifa, R. and Makhlof, L. (in press): Studies on heterophyid cercariae from Assiut province, III. The life cycle of Haplorchis yokogawi (Katsuta 1936), (Trematoda: Heterophyidae). Assiut Med. J. (in press).
- Fahmy, M.A.M.; Arafa, M.S.; Khalifa, R.; Abdel Rhman, A.M. and Mounib, M.E. (in press): Studies on heterophyid cercariae from Assiut province, Egypt, IV. Notes on the life cycle of Haplorchis taichui (Nishigori, 1924). Assiut Med. J. (in press).

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- Khalifa, R. and El-Naffar, M.K. (1978): Paramonostomum aegyptiacum n.s. (Trematoda, Notocotylidae) and its life. *Acta parasit. pol.*, 25, 323-332.
- Khalifa R.; El-Naffar, M.K. and Arafa, M.S. (1977): Studies on heterophyid cercariae from Assiut Province, Egypt. I. Notes on the life cycle of Haplorchis pumilio (Looss, 1896) with a discussion on previously described species. *Acta parasit. pol.*, 25, 25-38.
- Oran, L.A.M. (1973): Studies on the relation of snails to parasitic infections in Assiut Governorate. Ph. D. Thesis, Faculty of Veterinary Medicine, Assiut University, Egypt.
- Singh, P. and Pande, B.P. (1968): Adults of Eumegacetes artamii from white leghorn pullets infected with metacercariae from two dragon flies. *Curr. Sci.*, 37, 563-564.

EXPLANATION OF FIGURES

- Fig. (A): Cercaria drawn from specimens supervitally stained. (Camera lucida drawing).
- Fig. (B): Schematic representation of the pattern of penetration gland ducts.
- Fig. (C): Redia of cercaria of Haplorchis pumilio found as a mixed infection with the sporocysts of the present cercaria. (Camera lucida drawing).
- Fig. (D): Sporocyst showing the present cercaria inside its cavity and one cercaria getting out. (Camera lucida drawing).

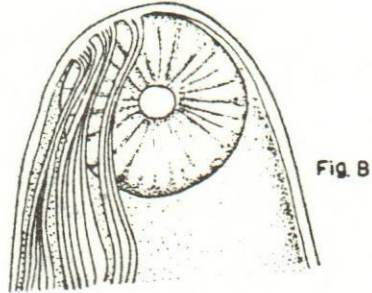
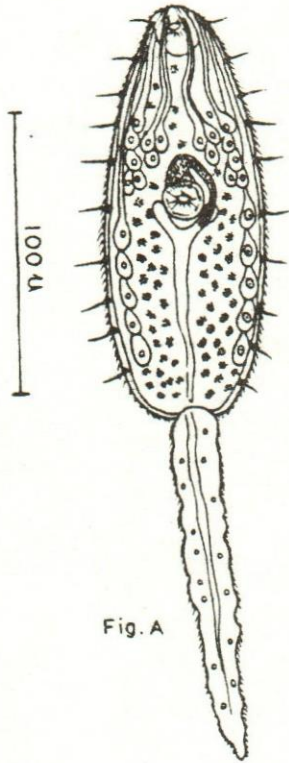


Fig. A

Fig. B

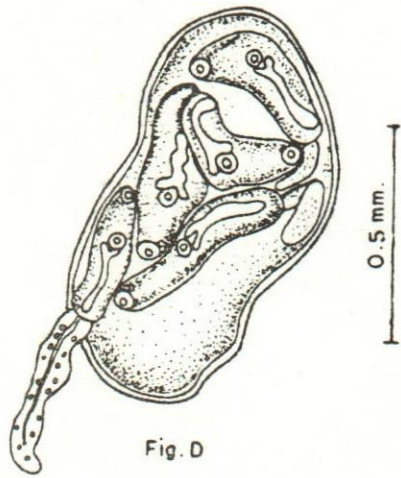


Fig. D

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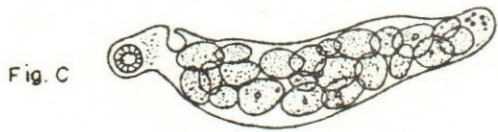


Fig. C

