Journal of the Egyptian German Society of Zoology

Invertebrate Zoology & Parasitology

J. Egypt. Ger. Soc. Zool.
Http: www.egsz.com
Email: info@egsz.org.
Vol. (44D): Invertebrate Zoology &
Parasitology 53-67, Feb, 2004
Rec. 20/12/2003

ISSN 1110-5364
14th International Conference
Faculty of Science. Fayoum
Cairo University
28 Feb. – 4 March, 2004

SURFACE ULTRASTRUCTURE OF THE SCOLEX OF THE POSTLARVA OF *TENTACULARIA BICOLOR* (CESTODA: TRYPANORHYNCHA)

Dayhoum A.M.Al-Bassel

Department of Zoology, Faculty of science, Cairo university, Fayoum Branch

Key Words : Ultrastructure, scolex, post larvae, *Tantacularia*, cestoda.

ABSTRACT

The surface morphology of the scolex of the postlarva of the trypanorhynch *Tentacularia bicolor* is hereby decreased in detail. Larvae were collected from the musculature of the marine fish *Dicentrarchus punctatus* from the coastal waters of the Eastern Region of Saudi Arabia. The scolex was investigated by light, scanning and transmission electron microscopy. The scolex is oval, elongate with homeoacanthous armature and 4 elongate, sessile and narrow bothridia. The bothridial margins were entirely fused to the scolex.There were 4 everted short tentacles on the apex with homeomorphous solid hooks and sinuous sheaths. The pars bulbosa in the anterior region of the scolex was provided with short bulbs but without prebulbar organ. In a cross section, unequalized microtriches and apical putative sensory papillae could be seen on the surface of the bothridial tegument. SEM of the surface tegument revealed the possession of knob-like microtriches and fine pores, whereas five kinds of microtriches were detected through TEM: 1-Spatulate microtriches of different lengths,each consisting of oval-shaped cap,long stalk and base,with dome-like projections on the cap and stalk, the latter being provided also with basal root-like extensions, hitherto undescribed in *Tentacularia bicolor.* Integumental connections linked the bases of the microtriches, forming transverse girdles around the worm, and may serve to coordinate traction and anchoring of the worm; 2-Filamentous microtriches, on the undulations of the distal cytoplasm and winding between the other microtriches, each consisting of very long stalk and very small spherical cap; 3- Cap-dominated filamentous microtriches, longer than the other microtriches and found on apical sensory papillae at irregular intervals on the undulations, the latter possessing putative sensory receptors; 4- Blade-like microtriches of different lengths, each cosisting of elongated cap and short stalk, both covered with dome-like projections.The bases were inserted into the undulations of the cytoplasm in small depressions like the spatulate microtriches; 5- Peg-like microtriches, each

having conical cap, long stalk and base the latter being inserted into the distal cytoplasm, and the stalk covered with bark-like scales.

INTRODUCTION

The cestode tegument has a complex structure which is multifunctional, serving for the synthesis and secretion of proteinaceous materials (Lumsden, 1966, Smyth, 1969) as well as for absorption, digestion, protection and excretion (Coil, 1991; Hayunga, 1991). As the parasite-host interface, it additionally serves for chemical and tactile reception (Faetherston, 1972; Webb & Davey 1974; Jones, 1988). Having such diverse functions necessitates a high degree of morphological specialization. The most dominant feature of the cestode tegument is the covering by microtriches, which are thought to be responsible for nutrition and protection, and possibly also the mechanical functions of anchoring and traction (Berger & Mettrick, 1972; Thompson *et al.*, 1980; Palm *et al.*, 1998). Microtriches show a wide range of morphologies, varying between species and somatic regions. For example, the tegument of *Floriceps minacanthus* has 6 different kinds of microtriches at different positions on the scolex (Richmond & Cairo, 1991), while *Taenia hydatigena* (Cyclophyllidea) has only 3 (Featherston, 1972). In contrast, Palm (1995) suggested no difference in the microthrix pattern of plerocercoids in comparison to adults. Most of the ultrastructural investigations of cestode tegument focus on species of medical or veterinary importance, such as those of *Diphyllobothrium* (Pseudophyllidea), *Hymenolepis* and *Taenia* (Cyclophyllidea). In contrast, groups such as the tetraphyllids and trypanorhynchs have been relatively little studied, especially by transmission electron microscopy, despite the fact that they have a worldwide distribution, and the most abundant cestodes in the marine environment (Palm *et al.*, 1998). The present investigation was undertaken in an attempt to determine the pattern of microtriches borne on the surface of the postlarval scolex of the trypanorhynch *Tentacularia bicolor* with reference to their possible functions.

MATERIAL AND METHODS

Numerous specimens of postlarvae were identified, according to Khalil *et al.*(1994), as *Tentacularia bicolor*. They were collected from the marine fish *Dicentrarchus punctatus* at the Research Centre for Fish Resources, Al-Qattif Province in the Eastern Region of Saudi Arabia. The postlarvae were found encapsulated in the deep muscles of fish. They were relaxed and fixed in 10% formaldehyde, then washed and stained in carmine. Drawings were made to the scale using a Camera lucida. For transmission electron microscopy, the scolices were transferred from formalin, via a series of Sorensen's phosphate buffers (pH 7.3) and graded alcohols, back to Sorensen's buffer, and then osmicated in 1% osmium tetroxide in Sorensen s buffer. The specimen were embedded in Spurr's embedding resin, and sectioned. The sections were stained with lead citrate and examined by a Zeiss 10 CA transmission electron microscope in Ruhr-Universitat, Bochum, Germany. Some specimens were prepared for scanning electron microscopy according to the method described by Al-Bassel (2002). All measurements are in millimetres, unless otherwise stated .

RESULTS

Light microscopy revealed that the postlarval scolex of *Tentacularia bicolor* was oval, elongate, 11-14 x 4.3-4.8. Bulbs were short, 0.093-1.26 x 0.19-0.22. Pars bothridia was elongate, 9.3-10.3 x 0.75-0.93.Tentacular sheaths were short, 0.24-0.41long. There were 4 tentacles, each measured 0.52-0.81 x 0.070-0.080. Pars vaginalis was 1.3-1.54 long. Basal armature was 0.13-0.14 x 0.12-0.13, and the metabasal armature 0.39-0.63 x 0.085-0.088. A prebulbal organ was absent (Fig.1). In a T. S., different types of microtriches and apical sensory papillae could be seen on the surface of the bothridial tegument. Beneath the surface, there were large spherical vacuoles(Fig.2). SEM showed the tentacles on the apex of the scolex (Fig.3) to bear homeomorph hooks(Figs.4,5).The tegument was also found to bear knob-like microtriches and small pores(Fig.6). These pores could be seen also under the superficial layer of the posterior end of the scolex (Fig.7). TEM, revealed additional tegumental features (Figs. 8,9,10, 11,12,13). These included: 1-Spatulate microtriches of variable length covering the bothridial tegument (Fig.8); 2-Filamentous microtriches borne on the undulations between the bases of the spatulate microtriches (Fig.8,9); 3-Cap-dominated filamentous microtriches (Figs.9,10); 4-Blade-like microtriches varying in length,whose bases were inserted into the undulations with deep depressions(Figs.8,10) ;5- Peg-like microtriches(Fig.11); 6- Apical sensory papillae (Figs. 2,9,10). Such tegumental features are described down in some details.

1-Spatulate microtriches and their basal connections:

These microtriches were very long,approximately 35-50μm. Each consisted of 3 distinct regions:an egg-shaped cap, long stalk and globular-shaped base (Figs.8,9). The outer surface of the stalk and cap were covered with dome-like projections(Figs.8,9,10). The cap extended from the distal end through the stalk until reaching the junction region, above the top of the undulation of the distal cytoplasm(Figs.8,9). The stalk ends into the base with root-like structures (Figs 9,10), observed here for the first time in *Tentacularia bicolor.*

The spatulate microtriches were connected together by girdles passing transversely between their bases below the surface of the distal cytoplasm (Figs.2,8). The Bases of these microtriches were inserted into the distal cytoplasm in depressions (Fig.8). Discrete radiating fibres could be seen around the basal ends of the spatulate microtriches (Fig.8), appearing continuous with the girdles connecting the microtriches.

2-Filamentous microtriches:

These were usually found on the whole surface of the bothridial tegument (Figs.8,9,10). Some of them were longer than the spatulate microtriches and winding among them (Fig.9). Each filamentous microtrich consisted of a spherical cap smaller than that of the other types of microtriches, and a very long stalk (Figs.8,9). This type of microtriches was borne on the tops of undulations beneath the former type (Figs.8,9,12).

3-Cap-dominated filamentous microtriches:

These were found only on the apical sensory papillae on the undulation of the distal cytoplasm(Figs.9,10). They were similar to the filamentous microtriches, but were in the form of tufts on the apical sensory papillae, and were longer than the other types of microtriches. The outer surface had knob-like small projections and the bases were in the distal cytoplasm with root-like structures(Fig.10).

4-Blade-like microtriches:

These were shorter than both the spatulate and filamentous microtriches(Figs.8,9,10). They varied in length between 12 and 32 μm, each having elongate cap and short rootless stalk. The outer surface of these microtriches had dome-like projections, and the bases were inserted into the distal cytoplasm in depressions and connected together with girdles similar to the spatulate microtriches (Figs.8,10).

5-Peg-like microtriches:

These were approximately 20-27 μm long, each having conical cap, short stalk and globular base, the bases being inserted into the distal cytoplasm and connected together by girdles(Fig.11). The dense medulla of the stalk was packed with abundant longitudinal microfilaments(Fig.11). The outer surface of the stalk was provided with bark-like scales, while the caps were provided with dome-like projections. Such scales were here observed for the first time in *Tentacularia bicolor* (Fig.11).

6- Apical sensory papillae

These papillae possessed putative sensory receptors on the distal cytoplasm between the spatulate microtriches (Figs. 9,10), each covered with a tuft of cap-dominated filamentous microtriches (Fig.10). Into the apices of the sensory papillae extended putative sensory receptors (Fig.10).

7-Subtegumental tissues and other structures

Beneath the distal cytoplasm lay numerous microfibrils comprising the lamina reticularis

(Fig.8). The majority of the tegumental mitochondria were found at this interface. Beneath this were large bundles of transverse, oblique and longitudinal muscles (Fig.12), and below this, some large oval and spherical vacuoles (Figs.2,13).

DISCUSSION

According to Khalil *et al.* (1994) the genus *Tentacularia* is characterized by craspedote scolex with distinct velum, homeoacanthous armature,four elongate, sessile and narrow bothridia, bothridial margins entirely fused to scolex, four short tentacles, solid hooks, sinuous sheaths, absence of prebulbar organ,pars bulbosa in anterior region of pars bothridialis, short bulbs and retractor muscles originating in base of bulb.*T. bicolar* has a highly active bothridial tegument, as demonstrated by the presence of amorphous secretions, originating from pore fields on the surface (Figs.6,7). Similar results were reported by Palm (1995) in *Pseudolacistorhynchus noodti.* The presence of other secretory structures and large vacuoles in the cuticular matrix (Figs.2,13), was formarly reported in some species of *Trypanorhyncha* (Lumsden,1966; Featherston,1972).

Spatulate microtriches were previously described by Berger & Mettrick (1971), where they most often occur on the bothridial surface. The first transmission electron microscopical study of the bothridial tegument of *Otobothrium insigne* was carried out by Hildreth & Lumsden (1987).who described two types of microtriches on the pars bothridialis. In the present work, it is assumed that the different types of the microtriches of *T. bicolor* covering the bothridial surface serve for nutrition, digestion, excretion and absorption as the worm penetrates the host tissues. Their bases are joined by connections, forming a series of girdles that pass transversely around the worm. Thus, the spatulate microtriches might be coordinated for their possible use for anchoring and traction mechanism.

Moreover, the transverse, longitudinal and oblique muscles which are found beneath the distal cytoplasm serve for contraction and relaxation during the movement of the worm (Fig.12). An additional function of the microtriches was added by Thompson *et al.*(1980) in case of *Proteocephalus tidswelli* (Proteocephalidea), i.e., an ancillary mechanical function, serving as spacers between the absorptive surface of the parasite and its host. It is interesting to note that the ultrastruture of the types of the microtriches of *T. bicolor* is similar to that of the microtriches (blade-like, giant blade-like and peg-like microtriches) described by Thompson *et al.*(1980) in the scolex and immature proglottids of adult *Proteocephalus tidswelli* (Proteocephalidea), except for the root-like structures of the spatulate microtriches and cap-dominated filamentous microtriches which are supposed to serve a nutritive function in *T. bicolor* (Figs.9,10). This was evidenced by the report of

Palm *et al.*(1998) in case of *Bombycirhynchus sphyraenaicum* (Trypanorhyncha).

Filamentous microtriches were reported from trypanorhynchan cestodes by Palm (1995) on the whole scolex, as well as on the strobilar integument by Lumsden (1966). The ultrastructure of the filamentous microtriches, described in the present study, is similar to at formerly reported by Hildreth & Lumsden (1987) from the bothridial surface of *Otobothrium insigne*, though these authors found a few microtriches having, on a the reverse, a short stalk and long dense cap. Palm *et al.*(1998) described two types of filamentous microtriches from *Bombycirhynchus sphyraenaicum*, equalized ones on the undulations and cap-dominated others on the sensory papillae projecting on the undulations, the two types were characterized by the presence of root-like extensions into the distal cytoplasm.They suggested that these root-like extensions served for nutrition. The present work agrees fully with the description of Palm *et al.*(1998), but further reports knob-like structures on the outer surface of the cap-dominated filamentous microtriches (Fig.10).

The undulations of the distal cytoplasm and the apical sensory papillae considerably increase the nutritional surface of the postlarva. This nutritional function of the microtriches was previously reported by Mackinnon & Burt (1983), Lumsden & Hildreth (1983) and Palm *et al.*(1998). Moreover, the cap-dominated filamentous microtriches of *T. bicolor* are suggested also to support a possible mechanoreceptor function of the sensory receptors. Some filamentous microtriches which partly extend above the tips of the spatulate microtriches might serve in transmitting mechanical stimulations to the sensory receptors. Such a function was previously reported by Palm *et al.*(1980) in *Bombycirhynchus sphyraenaicum*. Although filamentous microtriches are the commonest and simplest variant (Holy & Oaks,1986), their functions may be more complex than their simple morphological structure might indicate. Such diverse functions as nutrition (absorption and digestion) and mechanoreception would explain morphological differences in filamentous microtriches that have been described by many authors.

Other authors have reported dimorphic filamentous microtriches on different regions of various cestodes (Palm *et al.*, 1998). Halton *et al.*(1994) reported nerve endings at the bothridial margins of *Grillotia erinaceus* (Trypanorhyncha). Palm *et al.*(1998) reported regularly arranged adorned papillae on the bothridial surface of *Bombycirhynchus sphyraenaicum* bearing sensory receptor-like structures which they named putative sensory receptors. Numerous papillae with associated sensilla were detected on the scolex of the anoplocephalid *Monoecocestus americanus* by Blair

& Burt (1976).Okino & Hatsushika(1994) detected non-ciliated receptors within numerous microtriche-adorned papillae around the genetal atrium of *Spirometra erinacei* (Pseudophyllidea) to which they attributed an important role as sensory receptors in the orientation of cross-insemination.

The elevated location of the apical sensory papillae which possess putative sensory receptors in the present material, with the cap-dominated filamentous microtriches above the level of the spatulate microtriches, supports a mechanoreceptor function,receiving stimuli unhindered by the spatulate microtriches. This exposed position in *T. bicolor* is similar to that of the sensilla reported by Blair & Burt(1976), the long filamentous sensory processes by Hess & Guggenheim (1977), the unciliated structures by Halton *et al.*(1994)and the regularly arranged adorned papillae by Palm *et al.*(1998).

ACKNOWLEDGEMENTS

I would like to express my deep gratitude to Prof. Heinz Mehlhorn and Dr.G. Schmahl for their technical assistance during TEM work done at the Electron Microscopical Unit at Fakultät für Biologie, Lehrstuhl fur spezielle Zoologie und Parasitologie, Ruhr-Universität Bochum, FRG. I am also sincerely grateful to Prof. M.M.Ibrahim for the collection of the postlarvae.I wish to thank Dr. M. El-Damarany for helping in SEM study. Financial support was provided by the German National Research Council, (DFG) FRG.

REFERENCES

AL-BASSEL D.A. H. (2002) The surface structure of *Podocotyloides chloroscombri* (Digenea: Opecoelidae) from the marine fish *Trachurus mediterraneus* from Egypt. **Egypt.J. Zool. 38:** 309-316.

ANDERSON R. C. (1992) Nematode parasites of vertebrates: their development and transmission. CAB International, Wallingford.

BEGER J. METTRICK D.F. (1971) Microtrichial polymorphism among hymenolepid tapeworms as seen by scanning electron microscopy. **Trans. Am. Microsc. Soc. 90** ;393-403 .

BLAIR D. G. & BURT M.D.B.(1976) Observations on the ultastrucrure of papillae and associated sensilla on the scolex of *Monoecocestus americanus* Stiles,1895 (Cestoda:Anoploce-Phalidae). **Can. J. Zool. 54:** 802-806.

COIL W. H. (1991) Platyhelminthes Cestoidea. Microscopic anatomy of invertebrates,vol.3. Wiley-Liss. New York, pp 211-283.

FEATHERSTON D. W.(1972) *Taenia hydatigena.* IV. Ultrastructure study of the tegument. Z Parasitenkd 38:214-232.

HALTON D.W., MAULE A.G.,BRENNAN G.P,SHAW C.,STOITSOVA S.R. AND JOHNSTON C.F. (1994) *Grillotia erinaceus* (Cestoda, Trypanorhyncha) localization of neuroactive substances in the plerocercoid. Using confocal and electron-microscopic immunocytochemistry. **Exp. Parasitol.79:** 410-423.

HAYUNGA E .G. (1991) Morphological adaptions of intestinal helminths. **J. Parasitol. 77:** 865-873.

HESS E. & GUGGENHEIM R. (1977) A study of the microtriches and sensory processes of the tetrathyridium of *Mesocestoides corti* Hoeppli,1925, by transmission and scanning electron microscopy. **Z. Parasitenkd 53:** 189-199.

HILDRETH M .B.& LUMSDEN R.D.(1987) Microanatomy of the *Otobothtium insigne* plerocercus (Cestoda:Trypanorhyncha) **J.Parasitol. 73:** 400-410.

HOLY J. M. & OAKS J.A. (1986) Ultrastructure of the tegumental microvi-lli(microtriches) of *Hymenolepis diminuta.* **Cell Tissue Res. 244:** 457-466.

JONES A. (1975) The morphology of *Bothriocephalus scorpii* (Pseudo- phyllidea, Bothriocephalidae) from littoral fishes in Britain. **J. Helminthol. 49:**251-261.

JONES M . K . (1988) Formation of the paruterine capsules and embryonic envelopes in *Cylindrotaenia hickmani* (Cestode: Nemato-taeniidae) **Aust. J. Zool. 36:** 545-563.

KHALIL L.F., JONES A. AND BRAY R. A.(1994) Keys to the cestode parasites of vertebrates. CAB International. 751 pp.

LUMSDEN R.D. (1966) Cytological studies on the absorptive surfaces of cestodes. I .The fine structure on the strobilar integument. **Z . Parasitenkd 27:** 355-382.

LUMSDEN R .D. AND HILDRETH M. B. (1983) The fine structure of adult tape-worms and biology of the eucestoda. Vol.1 Academic Press, London.pp 178-233.

LYNN D. H. AND CORLISS J.O. (1991) Microscopic anatomy of invertebrates (Ciliophora). Vo;1 Wiley-Liss, New York , pp 333-467.

MACKINNON B. M. AND BURT M.D.B. (1983) Polymorphism of microtriches in the cysticercoid of *Ophryocotyle insignis* from the limpet *Patella vulgata.* **Can.J. Zool. 61:** 1062-1070.

PALM H.W. (1995) Untersuchungen zur Systrmatik von Russel bandwur- mern (Cestoda: Trypanorhyncha) aus atlantischen fischen. Ber. Inst. Meereskol, Kiel: 275.

PALM H.W. (1997a) Trypanorhynch cestodes from commercial fishes from north-east Brazilian coastal waters. **Mem. Inst. Oswaldo. Cruz. 92:** 69 79.

PALM H.W. (1997b) An altrnative classification of trypanorhynch cestode considering the tentacular armature as being of limited importance. **Syst. Parasitol. 37:** 81-92.

PALM H .W. (1998) surface ultrastructure of Plerocercoids of *Bombycirhynchus sphyraenaicum*

(Cestoda : Trypanorhyncha) **Parasitol. Res. 84:**195-204.

RICHMOND C. AND CAIRA J.N. (1991) Morphological investigations into *Floriceps minacanthus* (Trypanorhyncha : Lacistorhynchidae) with analysis of the systematic utility of scolex microtriches. **Syst. Parasitol. 19:**25-32.

THOMPSON R.C.A., HAYTON A.R. AND JUE SUE L.P. (1980) An ultrastructural study of the microtriches of adult *Proteocephalus tidswelli* (Cestoda: Proteocephalidea). **Z . Parasitenkd 64:**95-111.

SMYTH J. D.(1969)The physiology of cestodes. ' oliver and Boyd.Edinburgh

WEBB R. A. AND DAVEY K.G. (1974) Ciliated sensory receptors of the unactivated metacestode of *Hymenolepis microstoma*. **Tissue Cell 6:**587-598.

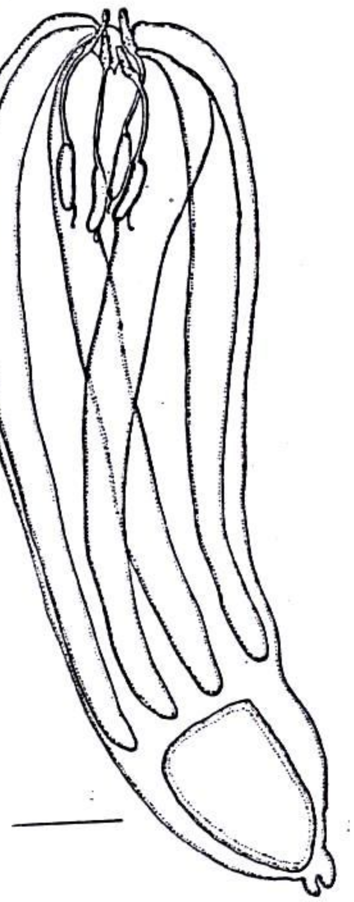
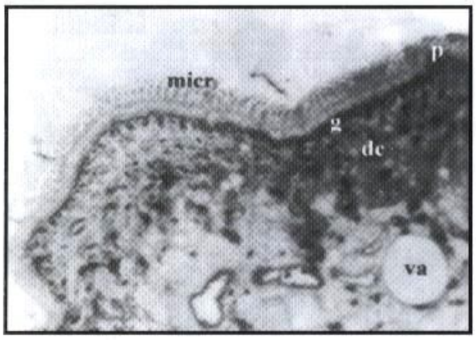


Fig. 1 Camera lucida drawing of the scolex of postlarva of *Tentacularia bicolor* showing the entire scolex in a ventral view (bar 2 mm)



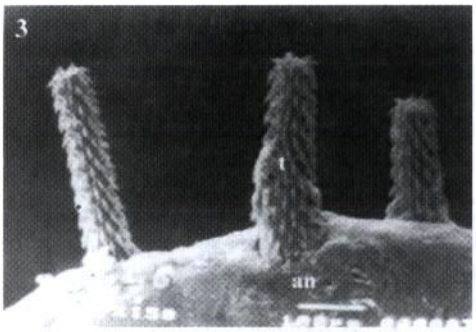


Fig.2: Light microscopy micrograph of transverse section of the scolex of the postlarvae of *T.bicolor*: (micr) microtriches, (p) apical sensory papillae,(g) girdle like structures,(dc) distal cytoplasm,(va) vacuole.

Fig.3: SEM Micrograph of the anterior end of the scolex of *T. bicolor*, showing three everted tentacles with hooks :(t) tentacle, (an) anterior end (bar 100μm)

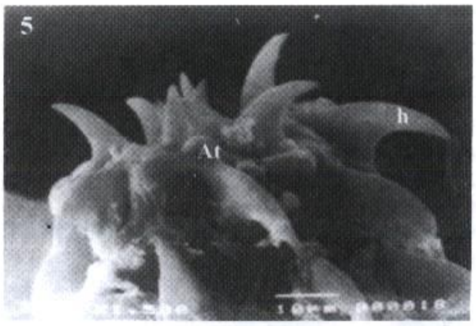
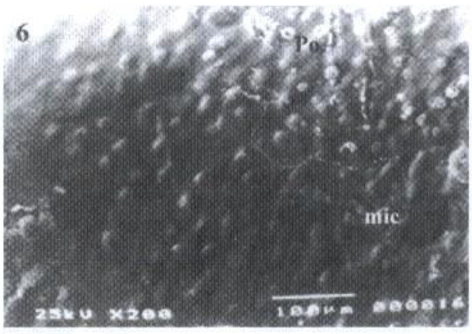


Fig.4 : En larged fig. 3 for showing the tentacle with its hooks (Bar 50 μm)

Fig.5 : SEM micrograph of *T. bicolor* . (At) Anterior end of tentacle, (h) hook (bar 10μm)



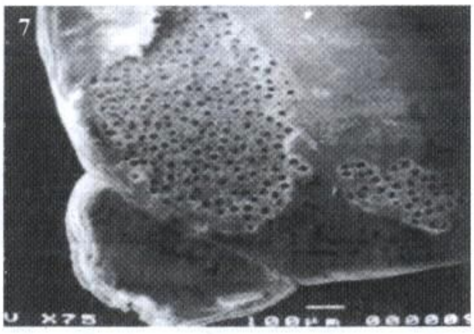


Fig.6: SEM micrograph of the surface tegument of the scolex of anterior region of *T.bicolor* showing (mic) microtriches (po) superfecial pores (bar 100μm)

Fig.7: SEM micrograph of the posterior region of the scolex of *T.bicolor*(postlarvae) showing fine pores on the surface of tegument(bar 100μm)

Fig.8: TEM Micrograph of the surface of the bothridial tegument of the scolex of *T. bicolor*: (sp)spatulate microtriches, (bl)blade-like microtriches, (b)base of the spatulate microtriches, (p)apical sensory papillae, (de)depression, (f)filamentous microtriches, (dc)distal cytoplasm, (g)girdles, (pr)dome-like projections, (ca)cap of filamentous microtriches, (csm)cap of spatulate microtriches.

Fig.9: TEM. Micrograph of the surface of the bothridial tegument of the scolex of *T.bicolor*:(sp) spatulate microtriches, (bl)blade-like microtriches, (p)apical sensory papillae, (c)cap-dminated filamentous microtriches, (f) filamentous microtriches, (r)root-like strcuture, (b)base of spatulate microtriches, (ca) cap of filamentous microtriches.

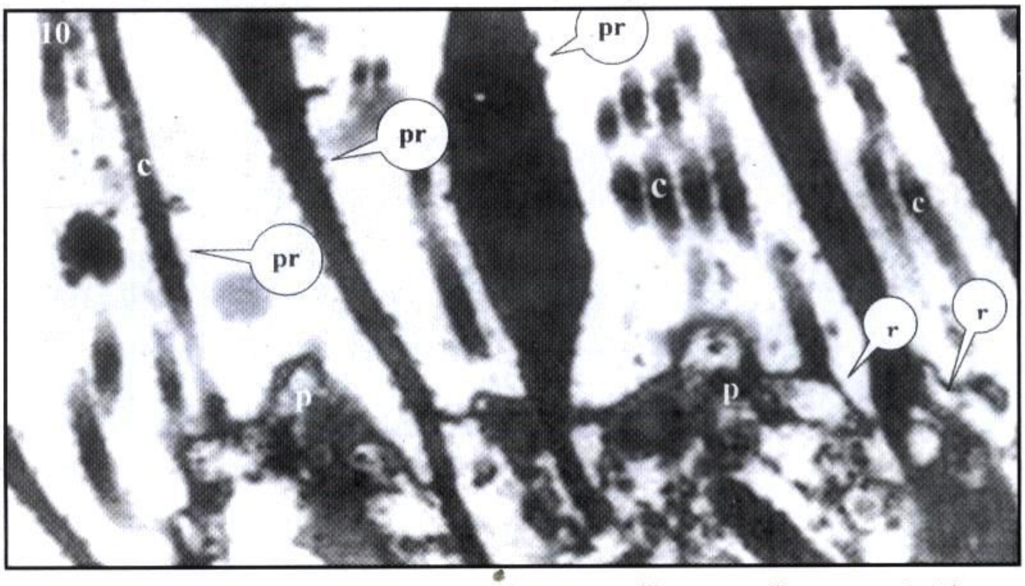
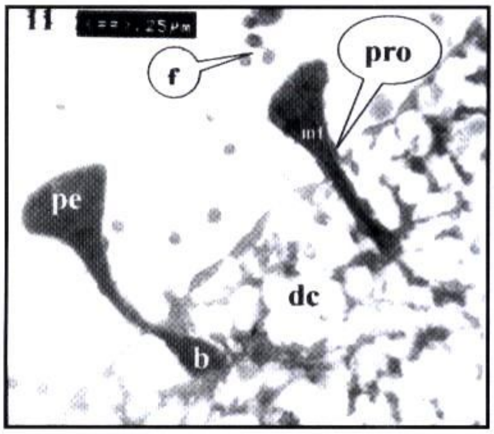


Fig.10: Enlarged part of Fig.9 for showing: (p) apical sensory papillae, (r) root-like structure, (pr) dome-like projections, (c) cap-dominated filamentous microtriches.



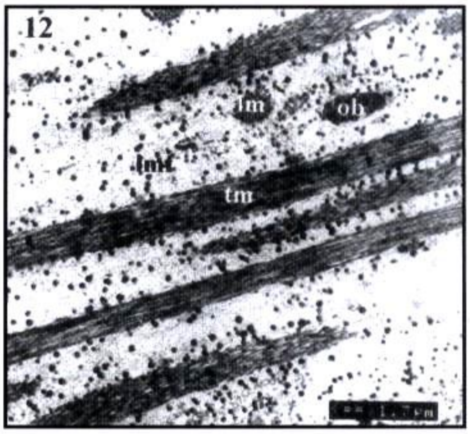


Fig.11: TEM Micrograph of the surface of the bothridial tegument of the scolex of *T. bicolor* : (dc) distal cytoplasm, (b)base of peg-like microtriches, (pe)peg-like microtriches, (f)filamentous microtriches, (pro)bark-like scales,(mf) microfilaments.

Fig.12 : TEM Micrograph under the distal cytoplasm of the tegument of *T. bicolor* : (tm) transverse muscles,(lm) longitudinal muscles,(ob) oblique muscles,(lmf)longitudinal muscles fibres

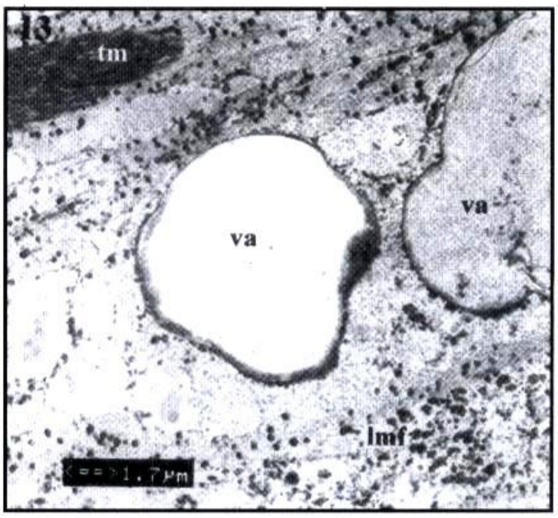


Fig. 13 : TEM Micrograph of the scolex of *T. bicolor* beneath the distal cytoplasm showing: (tm) transverse muscles, (va) vacuole, (lmf) longitudinal muscles fibres.

ISSN 1110-5364
Http: www.egsz.com
Email: info@egsz.org

المؤتمر الدولى الرابع عشر
للجمعية المصرية الألمانية لعلم الحيوان
كلية العلوم بالفيوم – جامعة القاهرة
٢٨ فبراير – ٤ مارس ٢٠٠٤

دراسة التركيب الدقيق للرؤيس فى طور ما بعد اليرقة لدودة *تنتاكيولاريا بيكولر* (سيستودا تريبانورينكا)

ديهوم عبد الحميد الباسل
قسم علم الحيوان– كلية العلوم بالفيوم – فرع جامعة القاهرة

تم فى هذا البحث دراسة بالميكروسكوب الضوئى والالكترونى الماسح والنافذ لرؤيس طور ما بعد اليرقة للدودة الشريطية *تنتاكيولاريا بيكولر* المجمعة من عضلات الاسماك البحرية من نوع *ديسنتراركس بينكتاتس* من المياة الساحلية للمنطقة الشرقية للمملكة السعودية.

وقد اظهر الميكرسكوب الضوئى أن رؤيس الدودة بيضاوى ممتد و مزود بدرع متجانس واربعة ممصات طويلة جالسة ضيقة وملتصقة كليا بالرؤيس الذى تبرز منه أربعة زوائد قصيرة لها اغلفة جيبية الشكل ومزودة بخطاطيف مصمتة ومتشابهة كما أن لها بصيلات قصيرة غير مزودة بالعضو الامامى , وتقع تلك البصيلات فى المنطقة الامامية لرؤيس الدودة. وَالسطح مغطى بكثافة بالزوائد الدقيقة التى تتخللها ما يشبه الاجسام الحسية البارزة وكذلك توجد فجوات كبيرة فى الأدمة.

وقد اظهرت الدراسة بالميكرسكوب الالكترونى الماسح أن سطح الدودة يزخر ببروزات دقيقة كما توجد ثقوب دقيقة فى الطبقة السطحية و تحت السطحية. كما كشفت الدراسة بالميكروسكوب الالكترونى النافذ أن السطح يحمل خمسة انواع من الزوائد:

النوع الاول يشبة الملعقة ذات اطوال مختلفة, وتتكون كل زائدة من قلنسوة كبيرة بيضاوية وساق طويل وقاعدة , وتحمل القلنسوة والساق بروزات مقببة دقيقة على سطحها الخارجى كما ان الساق تنتهى فوق القاعدة بما يشبه الجذور والتى تشاهد لاول مرة فى هذا النوع. كما أن قواعد تلك الزوائد تندغم فى السيتوبلازم السطحى المتموج فى ما يشبة الاخدود وتتصل ببعضها بموصلات يعتقد ان لها علاقة بالحركةوالتعلق.

و النوع الثانى خيطى الشكل ينتشر بين سيقان النوع الاول على السطح المتموج للسيتوبلازم وله ساق طويلة تحمل فى نهايتها قلنسوة صغيرة كروية الشكل.

ISSN 1110-5364
Http: www.egsz.com
Email: info@egsz.org.

أمـــا النوع الثالث فخيطى الشكل ويوجد على هيئة خصلات تشبه الاسوا ط محمولة على حلمات حسية يعتقد ان بها مستقبلات حسية على مسافات متفاوتة على السطح بين قواعد الزوائد. وقد يفوق فى طوله بقية الانواع وله جذ ور. وتحمل الساق على سطحها بروزات دقيقة.

الـــنوع الـــرابع يشـــبة نصل ورقة النبات وله قلنسوة طويلة وساق قصيرة ويحمل الاثنان بـــروزات مقبـــبة وهو أقصر من النوعين الاول والثانى ، ومتفاوت الأطوال وتندغم قواعدة فى السيتوبلازم السطحى فيما يشبه الأخدود مثل النوع الاول ولكن بدون جذور.

والـــنوع الخامس يشبة الوتد ولة قلنسوة مخروطية الشكل تحمل بروزات مقببة وساق طويلة تحمـــل علـــى ســـطحها زوائـــد قرصية الشكل تشبة قلف الاشجار و ينتهى بقاعدة مندغمة فى الســـيتوبلازم مـــثل الـــنوع الاول ولكـــن بدون جذور. كما توجد حزم من العضلات الطولية والدائرية والمائلة وكذلك فجوات كبيرة فى الطبقة الداخلية للسيتوبلازم.

مجلة الجمعية المصرية - الألمانية
لعلم الحيوان

علم الحيوان اللافقارى والطفيليات