

**A LARVAL CESTODE (TRYPANORHYNCHA: GRILLOTIIDAE)
ENCYSTED IN CARANGID FISH FROM THE RED SEA IN
JEDDAH, SAUDI ARABIA.**

By

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ABSTRACT

*Many larval cestodes were found encysted in the body cavity and mesentry of four species of carangid fish, **Carangoides bajad**, **C. fulvoguttatus**, **Caranx sexfasciatus** and **C. melampygus** collected from Red Sea in Jeddah from June 1998 to May 1999. Prevalences of infection were 47.08%, 47.22%, 45.83% and 8.33% respectively.*

*Plerocerci were identified as **Pseudogrillotia** sp. (Trypanorhyncha, Grillotiidae). Morphology of the scoleces are fully described. The present study constitutes new hosts and locality records of the parasite.*

INTRODUCTION

Although marine teleost fishes are definitive hosts of few tapeworm species, they are important intermediate hosts for trypanorhynchs, a large order of cestodes which mature in elasmobranchs (Schmidt, 1986). Plerocercoid larvae of several trypanorhynch species of piscivorous elasmobranchs have been reported and described from various hosts. Post larval stage (unencysted) of **Pseudogrillotia pleistacantha** was first described by Dollfus (1969) from the musculature of the teleost **Pogonias cromis** at Galveston, Texas. Carvajal,

et al. (1976) examined teleost and elasmobranch fishes for cestodes from the Pacific Ocean off the Hawaiian Islands. They recovered seven species of trypanorhynches, four of which were new. Adults *Pseudogrillotia basipunctata* were found in the spiral valve of *Carcharhinus amblyrhynchos* and plerocerci of the same species were obtained from the pharyngeal connective tissue of the porcupine fish, *Diodon hystrix*, by the previous authors. Plerocerci similar to those of *P. basipunctata* were also recovered from the eel, *Gymnothorax flavimarginatus* and the teleost *Arothron hispidus* but specific identification could not be made because the tentacles were not everted (Carvajal, *et al.* (1976). Escalante and Carvajal (1984) described *Pterobothrium acanthotruncatum* from mesentry and air bladder of *Coryphaena hippurus* from the North Coast of Peru and *Pseudogrillotia peruviana* from the mesentry of *Scomberomonas maculatus*. Mac-Kenzie (1985) stated that trypanorhynch plerocercoids are unusual in that the developing scolex they contain is identical to that of the mature worm, which permits reliable specific identification of the immature stages. Three *Grillotia* species (Cestoda: Trypanorhyncha) have been described from larvae taken from Australian teleosts, one by Shaharom and Lester (1982) and two by Sakanari (1989). Campbell and Beveridge (1993) described for the first time adult *Grillotia amblyrhynchos* and *Pseudogrillotia spani* collected from the spiral valves of carcharhinid sharks in Australian waters. Trypanorhynch cestodes of the family Pseudogrillotiidae have been also reported from sharks and skates in the Mediterranean (Campbell and Beveridge, 1993). Palm *et al.*, (1994) reported that plerocercoids of *Grillotia perelica* were highly host and organ specific to the swim bladder of *Caranx senegallus* from inshore fishes of the West African coast.

In Saudi Arabia, Banaja *et al.* (1979) described larval stage of a trypanorhynch cestode in the body cavity and musculature of the teleost fish, *Plectropomus maculatus* from the Red Sea. Scanning electron microscope (SEM) of the plerocercus scolex of that cestode classified it as *Floriceps saccatus* (trypanorhynch: Dasyrhynchidae) (Banaja and Roshdy, 1979). Banaja and Roshdy (1981) recorded and described for the first time some larval forms of a pterobothriid trypanorhynch cestode found in the body cavity and musculature of the mackerel fish, *Scomber japonicus* from the Red Sea. Abu-Zinada (1998) recorded and briefly described two species of larval cestodes, *Grillotia* sp. from the intestine of *Plectropomus muculatus* and *Otobethrium* sp. from the mesentry of *Lethrinus mahsena* from the Red Sea.

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The present paper describes for the first time a plerocercus of a pseudogrillotid trypanorhynch cestode found in the body cavities and mesenteries of four species of carangid fish, *Carangoides bajad*, *C. fulvoguttatus*, *Caranx sexfasciatus* and *C. melampygius*, commonly occurring in the Red Sea and were not studied before.

MATERIALS AND METHODS

A total of 864 fishes of four carangid species, *Carangoides bajad*, *C. fulvoguttatus*, *Caranx melampygius* and *C. sexfasciatus* (216 fish for each species), were collected from commercial fish market "Al Bangalah" on the Red Sea coast of Jeddah during the period from June 1998 to May 1999. Fishes were brought to the laboratory and examined immediately for helminth parasites. Cysts of cestode larvae were found in the body cavities and mesenteries of the infected fishes. Plerocerci were dissected, free from cysts and then after placed in distilled water until the tentacles evaginated. Then they were fixed in 70% hot ethanol or 10% formalin. Whole mount preparations were stained using Grenacher's alum carmine, dehydrated in a graded ethanol series, cleared in clove oil and mounted in canada balsam. Some scoleces were cleared and mounted temporarily in lactophenol or glycerine jelly to facilitate study of the tentacle armatures. Drawings were made with the aid of a drawing tube. Measurements are given in millimeters unless otherwise stated. The present larval cestode was identified according to Dollfus (1969), Schmidt (1986) and Campbell and Beveridge (1993)

RESULTS AND DISCUSSION

Examination of 864 carangid fishes for cestodes resulted in the recovery of larval trypanorhynch cestodes in the body cavities and mesenteries of 323 fishes (37.38%). Prevalances of infection were 47.08% in *Carangoid, bajad*, 47.22% in *C. fulvoguttatus*, 45.83% in *Caranx sexfasciatus* and 8.33% in *C. melampygius*.

Microscopical study of well developed scoleces from plerocerci revealed morphological features characteristic for the genus *Pseudogrillotia*, Dollfus, 1969 belonging to family Grillotidae Dollfus, 1969 emended. The following

description of the present plerocercus was based on ten specimens recovered from the body cavity and mesentery of the different examined fish species.

Description: (Plate II, figs. 1&2) and (Plate II, figs. 1-4).

As in other trypanorhyncha, the larval scolex is divisible into pars bothridialis, pars vaginalis and pars bulbosa. There are two posteriorly notched bothridia and four proboscides at the tip of the scolex, two in front of each bothridium. Each proboscis bears a large number of different types of hooks and spines when everted. Tentacle armature poeciloacanthous. The proboscis sheaths into which the proboscides invaginate are spirally coiled and extend throughout the pars vaginalis to connect to four long bulbs, located in the pars bulbosa. Immediately following these bulbs, there is a narrow connection, pars proliferans, which represents the neck in cestode strobila. Scolex measurements of specimens flattened under a cover glass are: pars bothridialis 468 μ m (390-550 μ m); pars vaginalis 4.5 mm (3.4-5.8 mm); pars bulbosa 1.05 mm (1-1.1mm.); bulb width 135 μ m (110-150 μ m). Evaginated proboscis 1.5 mm long.

Present observations on the cestode parasite in the body cavity and mesentery of the teleost *Carangid bajad*, *C. fulvoguttatus*, *Caranx sexfasciatus* and *C. melampygus* from the Red Sea, reveals previously unknown information on a trypanorhynchid plerocercus in the fish intermediate host. Morphological characteristics of the scolex and hook formula of the tentacles (proboscides) confirm the identity of a Pseudogrillotiidae species, a genus within the family Grillotiidae Dollfus, 1969 of the cestode order trypanorhyncha.

Dollfus (1969) created the genus *Pseudogrillotia* and the family Pseudogrillotiidae for *P. pleistacantha* because of its combination of two bothridia, craspedote scolex, metabasal armature with a band of numerous small hooks, lack of a chainette and possession of a postlarvae stage. The same author stated that, representatives of this family were similar to species of the family Grillotiidae, but differ by possessing a long and craspedote scolex. Schmidt (1986) and Campbell and Beveridge (1993) considered a craspedote scolex and postlarvae stage insufficient to separate *Pseudogrillotina* into another family and the latter authors emended the diagnosis of family Grillotiidae to accommodate genus *Pseudogrillotina* Dollfus, 1969. The Genus *Pseudogrillotia* contains four previously described species, *P. pleistacantha*

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Dollfus, 1969; *P. basipunctata* carvajal, Campbell and Conford, 1976; *P. peruviana* Escalante and Carvajal, 1984 and *P. Spani* Campbell and Beveridge, 1993.

This study reveals the occurrence of another species of *Pseudogrillotia* with new intermediate hosts and locality records. Specific identification of the present parasite is not decided due to the lack of knowledge about the adult worm and its final host.

Legends of Figures .

Plate I , Figs . 1 &2: *Pseudogrillotia* sp .(Camera lucida drawing) .

Fig .1: Scolex (plerocercus). A, pars bothridialis ; B , pars vaginalis ; C , pars bulbosa ;bo, bothridium ; bu , bulb ; pr, proboscis ; pp , pars proliferans ; pr.sh, proboscis sheath

Fig .2 : Tentacle armature , Metabasal bothridial face. h, hook ; s, spine .

Plate II , Figs . 1-4: *Pseudogrillotia* sp.(Photomicrograph)

Fig. 1 : Entire worm (x16) .

Fig .2 : Anterior part of scolex showing bothridia and spirally coiled tentacular sheathes (x100) . bo , bothridia ; tsh , tentacular sheath .

Fig 3: Anterior part of scolex with one evaginated tentacles showing tentacle armature , bothridial face (x100). t , tentacle ; ta , tentacle armature

Fig .4 :Anterior part of scolex with four evaginated tentacles showing tentacle armature , external face (x100). t , tentacle ; ta , tentacle armature .

PLATE (I)

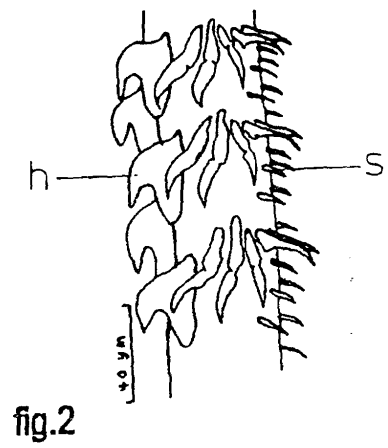
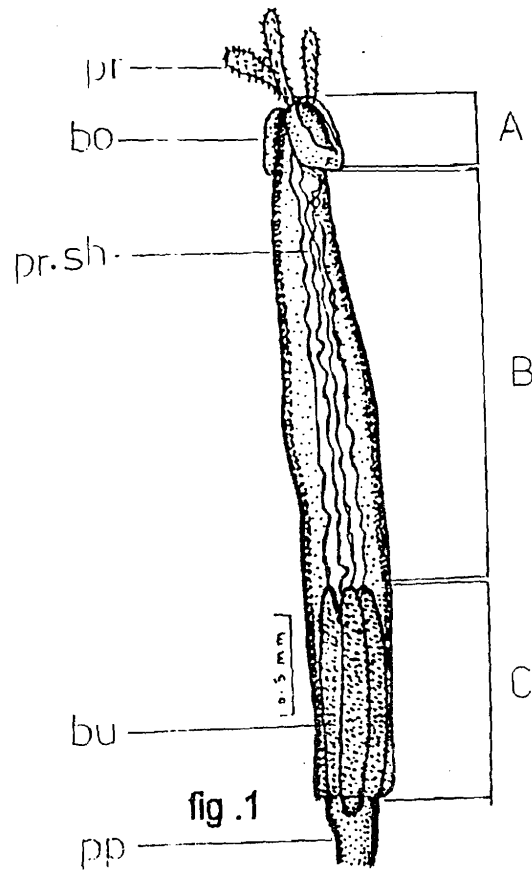


Plate II



fig.2

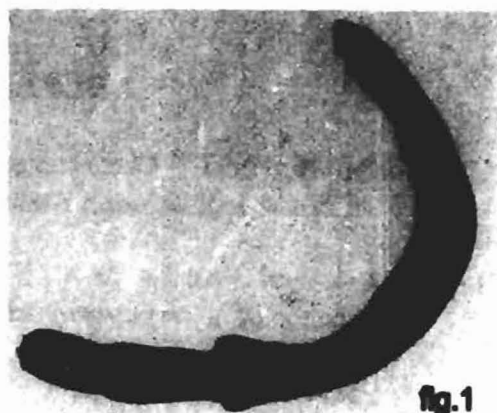
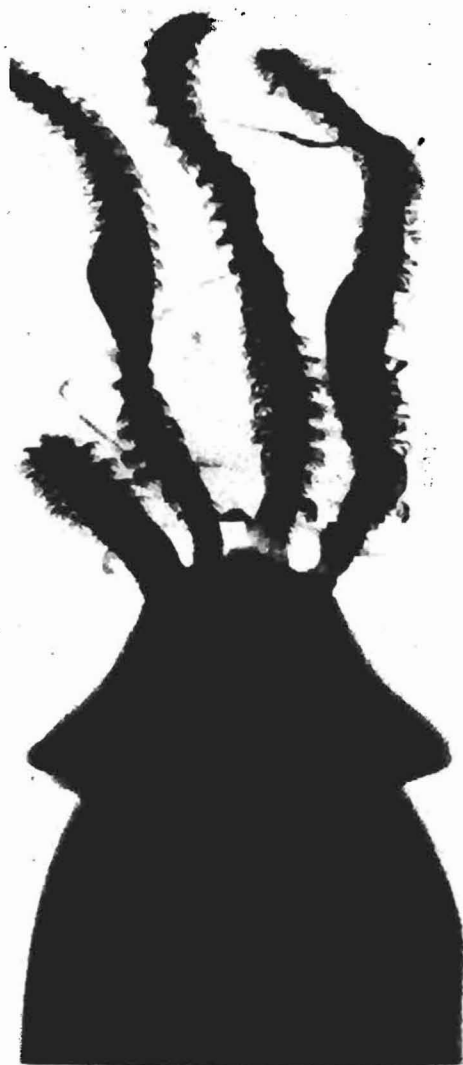


fig.1



fig.4



REFERENCES

- Abu-Zinada, N., 1998. Observations on two larval cestodes from Red Sea fishes at Jeddah Saudi Arabia. Vet. Med. J. Giza 46. (2).193-197.
- Banaja, A.A. and Roshdy, M.A., 1979. Scanning electron microscopy of the scolex of a *trypanorhynch* plerocercus in the fish, *Plectropomus maculatus* (Bloch). (Cestoda: Trypanorhyncha). Bull. Fac. Sci., K.A.U. Jeddah, 3: 29-35.
- Banaja, A.A. and Roshdy, M.A., 1981. Observations by light and scanning electron microscopy on larval stages of a pterobothriid trypanorhynch cestode in the makereel fish, *Scomber japonicus* from Red Sea. Bull. Fac. Sci., K.A.U., Jeddah, 5: 69-75.
- Banaja, A.A., Roshdy, M.A., Ghandour, A.M. and Farag, A.A., 1979. Observations on larval stages of a trypanorhynch cestode in the fish, *Plectropomus maculatus* (Bloch) from the Red Sea. Bull. Fac. Sci., K.A.U., 3: 9-18.
- Campbell, R.A. and Beveridge I., 1993. New species of *Grillotia* and *Pseudogrillotia* (Cestoda: *Trypanorhyncha*) from Australian sharks, and definition of the family Grillotiidae Dollfus, 1969. Transactions of the Royal Society of S. Aust., 117 (1): 47-53.
- Carvajal., J.R. Campbell, R.A. and Cornford, E., 1976. Some trypanorhynch cestodes from Hawaiian fishes, with description of four new species. J. parasitol. 62: 70-77.
- Dollfus, R. p.H., 1969. Quelques especes de cestodes Tetrarhynques de la cote At Lantique des Etats Unis, don't l'me n'etait pas connue a l'etat adulte. J. Fish Res Board. Can. 26: 1037-1061.
- Escalante, H., and Carvajal, J., 1984. Larval Trypanorhynch cestodes from peruvian teleost fishes, with descriptions of two new species. Studies on Neotropical Fauna and Environment (19). 4: 185-194.

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- Mac-Kenzie, K., 1985. The use of parasites as biological tags in population studies of herring (*Clupe harengus* L.) in the north sea and to the north and west of Scotland. J. Cons. Perm. Int. Explor. Mer. 42 (1): 33-64.
- Palm, H., Obiekezie, A. and Moller, H., 1994. Trypanorhynchid cestodes of commercial inshore fishes of the West African coast. Living Resour., (7): 153-164.
- Sakanari, J., 1989. *Grillotia heroniensis* sp. nov., and *G. overstreem*, sp. nov., (Cestoda: Trypanorhyncha). From Great barrier Reef Fishes. Aust. J. Zool. 37: 81-87.
- Schmidt, G.D., 1986. C.R.C. hand book of Tapeworm Identification: CRC press Inc., Florida.
- Shaharom, F.M. and Lester, R.J.G., 1982. Description and observations on *Grillotia branchi* n. sp., a larval trypanorhyncha from the branchial arches of the spanish mackerel, *Scomberomorus commerson*: Syst. Parasitol. 4: 1-6.