



A new record of *Pseudogrillotia spratti* Campbell and Beveridge, 1993 (Cestoda: Trypanorhyncha) parasitic in some carangid fishes from Iraqi marine waters

Khalidah S. Al-Niaeem¹, Suzan A. Al-Azizz² and Fatimah H. Al-Ataby²

1 Department of Fisheries and Marine Resources, College of Agriculture, University of Basrah, Iraq

2 Department of Microbiology, College of Veterinary Medicine, University of Basrah, Iraq

e-mail: kalidah_salim@yahoo.com

Abstract. A total 15 of *Pseudogrillotia spratti* Campbell and Beveridge, 1993 (Cestoda: Trypanorhyncha) plerocerci have been found in body cavity of three species of carangid fishes, *Carangiodes armatus*, *C. malabaricus* and *Megalaspis cordyla* which were collected from Iraqi marine waters. The parasite was recorded for the first time in the Iraqi marine waters, and *C. armatus*, *C. malabaricus* and *M. cordyla* are new hosts for this parasite.

Keywords: *Pseudogrillotia spratti*, *Carangiodes armatus*, *C. malabaricus*, *Megalaspis cordyla*, Iraqi marine waters.

Introduction

Trypanorhynch is cestoda common parasite of most abundant marine fishes especially in tropical waters (1). It was mature in elasmobranch and often use teleost fishes as intermediate or transport hosts, so, worms in the fish flesh or body cavity reduce the fish market value by making them unappealing to consumers (2).

The first record of many trials is about Trypanorhyncha by Mirzayans (3) across of the Iranian coast who recorded unrecognized species of *Ptrobthrium* in *Carangiodes* sp., while, Tigari et al. (4) reported an unrecognized cestoda of *Grillotia* sp. from the membrane of *Thunnus thynnus* from the Gulf of California and Mexico.

Beveridge et al. and Palm et al. (5, 6) recorded Trypanorhyncha in various oceans, which are a group of tapeworms described from all world Oceans (1). Highest species diversity is in tropical and subtropical waters, where the diversity of the elasmobranch final hosts is also high, many trypanorhynch have low host specificity in the teleost second intermediate host, making this group of tapeworms one of the most frequent groups of parasite in warm water marine fish (7).

Palm (1) illustrated that the Indonesian archipelago is at the center of the trypanorhynch distribution, with a total of 54 different trypanorhynch out of 254 and the known species were recorded mainly from the southern cost of Java. While, information about trypanorhynch cestodes of Brazil was recorded by Palm (8). Limited studies were done on trypanorhynch in marine fishes from waters of the Red Sea, among the literature from Egypt are those of Abdou (9, 10, 11). Furthermore, information on trypanorhynch from the Arab Gulf were restricted in few studies (1, 3, 12, 13, 14, 15, 16 17, 18, 19, 20).

So, this study was designed to investigate the parasitic trypanorhynch from three species of carangid fishes: *Carangiodes armatus*, *C. malabaricus* and *Megalaspis cordyla* in the northwest of the Arab Gulf within the Iraqi territorial marine waters.

Materials and Methods

A total of 454 fish specimens (3 *Carangiodes armatus*, 240 *C. malabaricus* and 214 *M. cordyla*), were examined for endoparasites during the period from September 2011 to March 2012. They were captured by trawl net from the Iraqi marine waters, northwest Arab Gulf (latitudes 47° 30' to 48° 15'; longitude 30° 50' to 30° 00'). The fishes were transported to the laboratory, Cestodes were removed from the body cavity in and fixed 70% ethanol and stained with acetocarmine stain according to the method by Palm (1).

Measurements were made using an ocular micrometer. Drawings were made using a camera Lucida. Cestodes were identified on the basis of their morphological features according to Palm (1). Some specimens were sent to Prof. Dr. Harry W. Palm, Department of Fisheries Biology, Institute Zoo Morphology, Germany for confirmation of the identification.

Statistical analysis

In order to determine the statistical significance among different variables SPSS program (17.00), ANOVA table at the level of probability of 0.05 (LSD) was used to compare differences in prevalence values in different hosts.

Results

Cestodes belong to *Pseudogrillotia spratti* Campbell and Beveridge, 1993 of the family Grillotiidae, order Trypanorhyncha.

Number of cestodes: 15 specimens.

Number of measured cestodes: 8 specimens.

Number of infected fishes: 11.
 Hosts: *Carangiodes armatus*, *C. malabaricus* and *Megalaspis cordyla*.
 Site of infection: body cavity.
 Locality: Northwest Arab Gulf within the Iraqi territorial waters.
 Material deposition: Voucher specimens were deposited in the Natural History Museum, London accessions NHMUK 2012.6.1.3.

In table (1), there was a variable in prevalence of infected fishes, *C. armatus*, *C. malabaricus* and *M. cordyla* (33.3, 2.91, 1.4 %, respectively) and there was a variable in mean intensity in fishes, *C. armatus*, *C. malabaricus* and *M. cordyla* (1, 1.42, 1.3 %, respectively). The statistical analysis showed a significant difference under $P < 0.05$.

Table 1. Infection rate of *Pseudogrillotia spratti* in the body cavity of three species of the carangid fishes during the present study.

| Fish species | Fish examined | Fish length (cm) | | Fish infected | prevalence (%) | Mean intensity |
|----------------------------|---------------|------------------|-----|---------------|----------------|----------------|
| | | Mean | ±SD | | | |
| <i>Carangiodes armatus</i> | 3 | 31 | 1 | 1 | 33.3* | 1 |
| <i>C. malabaricus</i> | 240 | 21.5 | 4.5 | 7 | 2.91 | 1.42** |
| <i>Megalaspis cordyla</i> | 214 | 26 | 5.5 | 3 | 1.4 | 1.3 |

* significant differences at $p < 0.05$, sig= 0.041, ** significant differences at $p < 0.05$, sig= 0.033.

This species was found encapsulated in body cavity of *C. malabaricus*, *C. armatus* and *M. cordyla*. Scolex region is divided into four regions: pars bothrialis, pars vaginalis, pars bulbosa and pars post bulbosa (appendix) (Figs. 1 & 2).

Total length 28-30 (29) mm, and 0.03-0.05 (0.04) mm in wide. Tentacle sheath spiral. Pars bothrialis is composed of two bothria and two probosces in front

of each bothrium, which are located at tip of Scolex, Bulbs are much shorter than pars vaginalis, they measure 0.4-0.6 (0.5) mm long and 0.2-0.3 (0.2.5) mm wide. Pars vaginalis is 0.42-0.25 (0.24.5) mm long and 0.6-0.4 (0.5) mm wide. Pars bulbosa is 0.17-0.20 (0.16) mm long and 0.02-0.03 (0.02.5) mm wide.

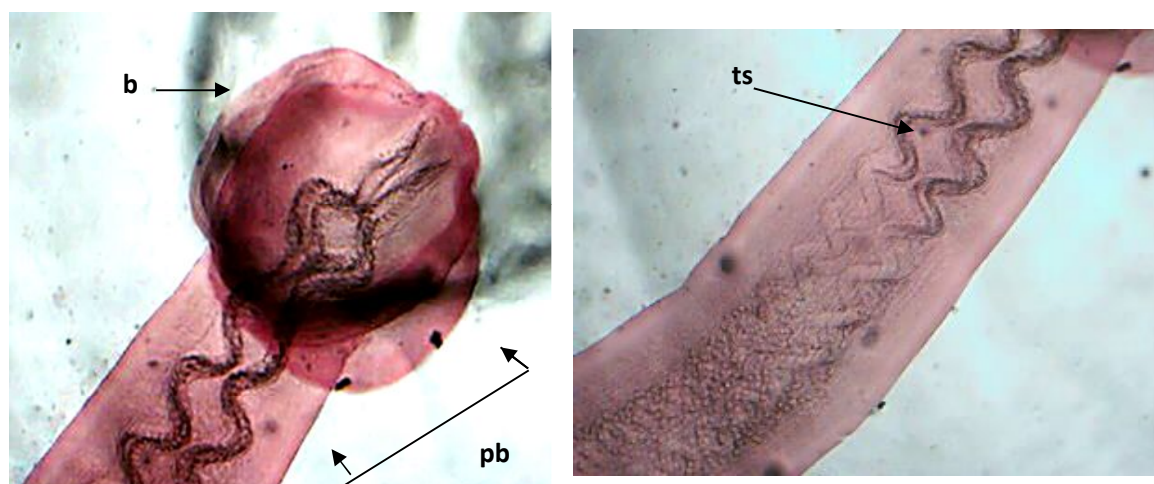


Fig. (1): *Pseudogrillotia spratti*, (b) bothrium, (pb) pars bothrialis, (ts) tentacle in sheath. (100X Acetocarmine stain).

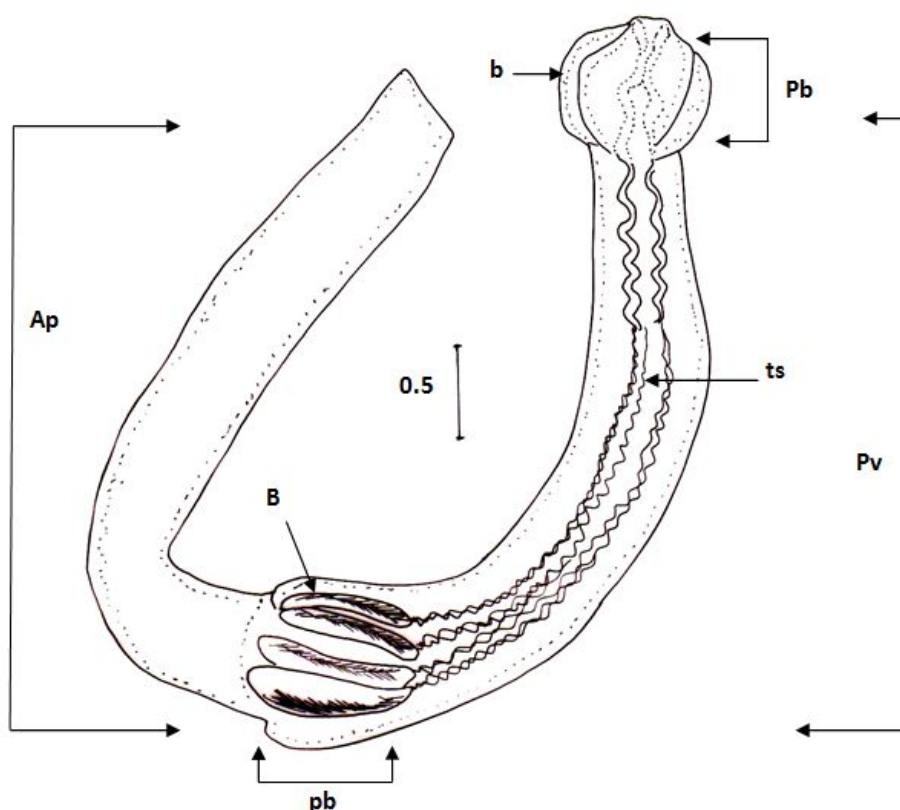


Fig. (2): *Pseudogrillotia spratti*, (Ap) Appendix, (B) Bulb, (pb) pars bulbosa, (b) bothrium, (Pb) pars bothrialis, (Pv) pars vaginalis, (ts) tentacle in sheath.

Discussion

Taxonomically, the trypanorhynch cestodes was complex and considered the most chaotic and confused of tapeworm group (8), Palm (21) divided the Trypanorhyncha into two suborders: Atheca and Thecaphora on the basis of presence or absence of a larvae with a blastocyst.

The current study recorded this species and agreed with Kardousha (22), in their description in the relatively long scolex, long pars vaginalis long, small hooks but less measurements. By reviewing the references of these species is registered it was found that this is the first record in Iraq.

Campbell and Beveridge (23) found the genus *Pseudogrillotia* and selected *P. spratti* as a new species from Australian shark. Also Kardousha (22) recorded this species from the fish *Liza macrolepis*.

Trypanorhynchid cestodes of this group have been reported from four species of carangid fishes (*Carangoides bajad*, *C. fulvoguttatus*, *C. sexfasciatus*

and *C. melampygyus*) in Saudi Arabia coast of the Red Sea (24), and from *Lethrinus lentjan* in Yemeni coast of the Red Sea (25). The second report on this cestode from the Yemeni waters of the Red Sea was from the same fishes by Al-Zubaidy and Mhaisen (26).

References

1. H.W. Palm (2004). The Trypanorhyncha Diesing, 1863. PKSPL-IPB Press, Bogor, x+710 pp.
2. K. Morsy; A.R. Bashtar; F. Abdel-Ghaffar; S. Al Quraishy; A. Al Ghamdi, and N. Mostafa (2013). First identification of four trypanorhynchid cestodes: *Callitetrarhynchus speciosus*, *Pseudogrillotia* sp. (Lacistorhynchidae), *Kotorella pronosoma* and *Nybelinia bisulcata* (Tentaculariidae) from Sparidae and Mullidae fish. Parasitol. Res., 112(7): 2523-2532.



3. A. Mirzayans (1970). A case report of a Cestoda (*Pterobothrium*) found in fish from Persian Gulf. J. Vet. Fac. Univ. Tehran, Iran, 26: 43-48.
4. M. Tigari, C.V. Radhakrishnan, and B.R. Howard (1975). Occurrence of infection by the cestodes *Grillotia* in Persian Gulf fish. Am. J. Vet. Res., 36: 703.
5. I. Beveridge, and R.A. Campbell (1993). A revision of *Dasyrhynchus* Pintner (Cestoda: Trypanorhyncha), parasitic in elasmobranch and teleost fishes. Syst. Parasitol., 24: 129-157.
6. H.W. Palm, S.L. Poynton, and P. Rutledge (1998). Surface ultrastructure of plerocercoid of *Bombycirhynchus spyraenaicum* (Pintner, 1930) (Cestoda: Trypanorhyncha). Parasitol. Res., 84: 195-204.
7. H.W. Palm, and J.N. Caira (2008). Host specificity of adult versus larva cestodes of the elasmobranch tapeworm order Trypanorhyncha. Int. J. Parasitol., 38(3-4): 381-388.
8. H.W. Palm (1995). Study of the systematics of tapeworms (Cestoda: Trypanorhyncha) of Atlantic fishes. Berichte aus dem Institut für Meereskunde an der Christian-Albrechts-Universität Kiel, Nr. 275: 1-238. (in German).
- 9- E.N. Abdou, Light and scanning electron microscopy of *Floriceps* sp. plerocercoid (Cestoda: Trypanorhyncha) from the Red Sea fish *Tylosurus choram* (2000). J. Union Arab Biol., 14(A): 37-47.
10. E.N. Abdou (2001). A record of *Floriceps* sp. plerocercoid larvae (Trypanorhyncha) from the Red Sea fish *Euthynnus affinis* with scanning electron microscopy. J. Egypt. Ger. Soc. Zool., 35(D): 29-38.
11. E.N. Abdou (2005). Scanning electronic microscopy of the plerocercoids of *Floriceps minacanthus* (Cestoda: Trypanorhyncha) parasitize the fish *Cephalolis micri*, a new host record in the Red Sea- Egypt. J. Egypt. Germ. Soc. Zool., 47(D): 133-145.
12. K.S.R. Al-Kuwari, M.F. Saoud, and M.M. Ramadan (1996). Biodiversity of helminthes parasites of fishes Arabian Gulf, with special reference to digenetic trematodes and cestodes. Qatar Univ. Sci. J., 16(1): 141-153.
13. K.S.R. Al-Kuwari, and M.M. Kardousha (2002). Helminthes parasites of fish from Qatari water in the Arabian Gulf. SARC, Project No. 4/10-97, 1-67p.
14. M.A. Hassan, H.W. Palm, M.A. Mahmoud and F.A. Jama (2002). Trypanorhynch cestodes from the musculature of commercial fishes from the Arabian Gulf. Arab Gulf J. Sci. Res., 20(2): 74-86.
15. S.A.M. Al-Daraji (1995). Taxonomical and ecological studies on the metazoan parasites of some marine fishes of Khor Al-Zubair estuary, north-west of the Arabian Gulf. Ph. D. Thesis, Coll. Agric., Univ. Basrah: 182pp.
16. A.H. Ali (2001). Pathological effects of helminths parasitic on some local fishes. M. Sc. Thesis, Coll. Agric., Univ. Basrah: 174pp. (In Arabic).
17. A.H. Ali (2008). Taxonomy of helminth parasites in some marine and freshwater fishes and the relation of some of it's with their final hosts in southern of Iraq. Ph. D. Thesis, Coll. Agric., Univ. Basrah: 336pp. (In Arabic).
18. N.K. Al-Salim and A.H. Ali (2007). First record of three hosts infected by the plerocercoid of *Otobothrium penetrans* Linton, 1907 (Cestoda: Trypanorhyncha) in Khor Ummia, Arabian Gulf. Basrah J. Agric. Sci., 20(1): 16-26.
19. M.A.-A. Bannai (2002). Parasites of some marine fishes of Khor Abdulla, north-west Arabian Gulf. M. Sc. Thesis, Coll. Educ., Univ. Basrah: 103pp. (In Arabic).
20. M.A.A. Bannai (2008). Trypanorhynchid cestodes from fishes of Khor Abdullah, Arabian Gulf. Basrah J. Vet. Res., 7(2): 44-51.
- 21- H.W. Palm (1997). An alternative classification of trypanorhynch cestodes considering the tentacle armature as being of limited importance. Syst. Parasitol., 37:81-92.
- 22- M.M. Kardousha (1999). Helminth parasite larvae collected from Arabian Gulf fish. II. First record of some Trypanorhynch cestodes from economically important fishes. Arab Gulf J. Sci. Res., 17(2): 255-276.
- 23- R.A. Campbell, and I. Beveridge (1994). Order Trypanorhyncha Diesing, 1863. In: Kalil, L.F., Jones, A., and Bray, R.A. (eds.) Keys to the cestode parasites of vertebrates. CAB International, Wallingford, 51-82.



- 24- F.H. Toula (1999). A larval cestode (Trypanorhyncha: Grillotiidae) encysted in carangid fish from the Red Sea in Jeddah, Saudi Arabia. Bull. Natl. Inst. Ocean. Fish. Alexandria, Egypt, 25: 411-419.
- 25- A.B. Al-Zubaidy (2006). First record in Yemen of two larval trypanorhynch cestodes in commercial fish (*Lethrinus lentjan*) from the Red Sea. J. King Abdulaziz Univ., Mar. Sci., 17: 79-87.
- 26- A.B Al-Zubaidy and F.T. Mhaisen (2011). Larval tapeworms (Cestoda: Trypanorhyncha) from some Red Sea fishes, Yemen. Mesopot. J. Mar. Sci., 26(1): 1-14.