

First record of the parasitic copepod, *Brachiella trichiuri* Gnanamuthu, 1951 (Crustacea: Lernaepodidae) on *Trichiurus lepturus* L. (Osteichthyes: Trichiuridae) in the Persian Gulf

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The Lernaepodidae is a cosmopolitan family of copepods parasitic on both elasmobranchs and teleosts in marine and freshwater habitats. *Trichiurus lepturus* L. is a commercially valuable benthic-pelagic fish inhabiting continental shelves and slopes worldwide. In the present study 74 specimens of *T. lepturus* were caught in the Persian Gulf, 12 of which were infected with female *Brachiella trichiuri* Gnanamuthu, 1951. They were attached firmly to the branchial arches of the host, and had a mean body length of 4.56 ± 0.30 mm. Prevalence, mean intensity (\pm SE) and mean abundance (\pm SE), of infection were 16.2%, 0.38 ± 0.14 and 2.33 ± 0.61 , respectively. This is the first record of *B. trichiuri* from the Persian Gulf.

Key words: *Brachiella trichiuri*, *Trichiurus lepturus*, Persian Gulf, Parasitic copepods.

INTRODUCTION

Trichiurus (ribbonfish or cutlassfish) are benthic-pelagic predators, inhabiting continental shelves and slopes worldwide. *Trichiurus lepturus* L. is a cosmopolitan commercial species with an annual harvest of 1,400,000 tonnes (Tzeng et al., 2007).

The Lernaepodidae is a successful group of parasitic copepods having a unique mode of attachment in which the maxillae form maxillary arms, the apex of which possesses an anchor process, the bulla, which is embedded in the host. It comprises more than 260 species which parasitize both elasmobranchs and teleosts. The subject of this study is the species *Brachiella thynni* Cuvier, 1830 (Kabata, 2003).

Previously recorded copepod parasites of *Trichiurus lepturus* include, *Metacaligus uruguayensis* Thomsen, 1949 from the branchial cavity of the host from the Gulf of Cariaco and Caribbean Sea (Ho and Bashirullah, 1977); *Lernanthropinus* sp. and *Nothobomolochus* sp. from the branchial cavity and *Metacaligus uruguayensis* Thomsen, 1949 from the oral cavity off the southern Java coast, Indonesia (Jakob and Palm, 2006); *Caligus arii* Bassett-Smith, 1898 on the host body surface in Taiwan (Ho et al., 2007); *Brachiella trichiuri* Gnanamuthu, 1951 from the buccal cavity and gill arches, *Metacaligus uruguayensis* Thomsen, 1949 from the buccal cavity and *Peniculus trichiuri* Gnanamuthu, 1951 from the body surface, in the south-west coast of India (Radhakrishnan and Nair, 1983).

In the present study copepods from the branchial cavity of *T. lepturus* caught in the Persian Gulf were identified.



FIGURE 1.- Sampling location, the Persian Gulf (www.persiangulfonline.org).

MATERIALS AND METHODS

Seventy four *T. lepturus* were collected from Boushehr coastal waters, in the Persian Gulf, Iran. Specimens were collected from 51° 19' 4" to 51° 35' 7" E and from 27° 21' 6" to 27° 29' 1" N (fig. 1) at 55 m depth by a Kish 811 trawler in July, 2008. After measuring the standard length, fish were sexed and the branchial cavities were examined for parasitic copepods. Parasites were preserved in 70% ethanol.

Slides were prepared by the glycerin method of Jakob and Palm (2006). Specimens were cleared in a glycerin-ethanol mixture for 16 h at 35°C and transferred to a drop of glycerin in the center of a slide. To avoid introducing air-bubbles onto the slides, mounted slides were kept for a short while on a hot plate. The cover slip was supported off the slide with a piece of heat-resistant modeling clay at each corner. The cover slip was then applied with slight pressure. Paraffin wax was deposited around the cover slip and melted on the hot plate at about 60°C to form a seal.

The specimens were identified using keys by Kabata (2003) and Pillai (1985). Figures were drawn with the aid of *camera lucida* on stereomicroscope. Data were analyzed using the SPSS 13.0 package.

RESULTS AND DISCUSSION

Females of *Brachiella trichiuri* were collected from the gill cavity of *T. lepturus* from the Persian Gulf for the first time.

All parasites were firmly attached to the gill arches. The prevalence, mean intensity (\pm SE) and mean abundance (\pm SE) of parasite were 16.2%, 0.38 ± 0.14 and 2.33 ± 0.61 , respectively. The maximum number per host was 7.

The parasites lengths were 3.95-5.50 mm with a mean length (\pm SE) of 4.56 ± 0.30 mm. Morphological measurements were made on five specimens. Trunk length was 1.70 ± 0.16 mm,

diameter 1.03 ± 0.09 mm; Egg sacs length was 2.5 ± 0.18 mm and diameter 0.42 ± 0.03 mm. Egg mean diameter was 0.12 ± 0.01 mm. The two longer dorsal trunk processes were 1.7 ± 0.15 mm in

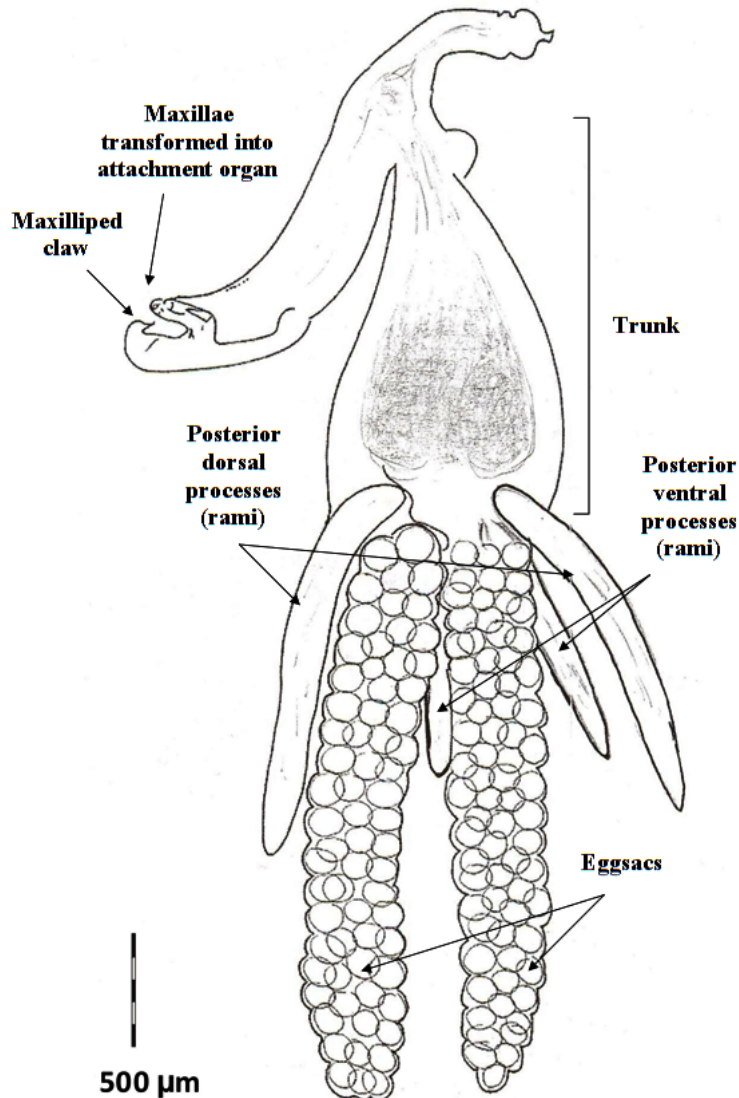


FIGURE 2.- Female *Brachiella trichiuri* from *Trichiurus lepturus*.

length and the two ventral processes were 1.114 ± 0.08 mm (fig. 2). Process (ramus) diameter was 0.16 ± 0.01 mm.

Parasitic copepods are common on wild and cultured marine finfish. With the expansion of marine aquaculture, the importance of parasitic copepods as disease causing agents has been raised, as noted by Johnson et al. (2004). *Trichiurus lepturus* is an important commercial fish in the Persian Gulf, so the discovery of this parasite may be significant. In this study, no lesions at the site of infection on the gill arches were detected.

According to Kabata and Tareen (1981), parasitic copepods appear to be unusually abundant on fishes of the Indian Ocean and adjacent seas. This high abundance of copepod species parasitizing

local fishes may be due to ancient connections between this region and the Tethys, which seems to have been an evolutionary hothouse for parasitic copepods (Kabata and Tareen, 1981). However, there is no record of parasitic copepods in the Persian Gulf and no cutlassfish parasites have been recorded previously in Iranian waters of the Persian Gulf.

The highest copepod prevalence reported in *T. lepturus* is *Metacaligus uruguayensis*. Radhakrishnan and Nair (1983) and Jakob and Palm (2006) reported prevalences of 59.2% and 34%, respectively. According to Radhakrishnan and Nair (1983), infection of *T. lepturus* by *B. trichiuri* and *Peniculus trichiuri* was 38.36 and 0.27%, respectively.

There are few reports of *B. trichiuri* from *T. lepturus* or its body size. Pillai (1985) reported the length of male and female to be 0.5 and 3.3 mm respectively, while Ho and Bashirullah (1977) reported a mean length of males and females of 4.72 and 4.75 mm, respectively. In the present report, *B. trichiuri* was larger than is described in the Pillai (1985) key and more similar to the Ho and Bashirullah (1977) report.

In a study by Chandran and Nair (1980) *B. trichiuri* was reported from the buccal cavity and symphyses of the gill arches of *Trichiurus savala* Gnanamuthu, 1950; however, the drawing of the copepod seems to show a member of the family Trebiidae or Caligidae and not *B. trichiuri*.

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