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Parasitic fauna of the spiny eel, *Mastacembelus mastacembelus* Banks et Solander (Teleostei: Mastacembelidae) in Iran

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Summary

The parasite fauna of 50 specimens of spiny eel obtained from two lakes, Zarivar (in Kurdistan province) and Parishan (in Fars province) and one river, Heleh (Booshehr province) were examined during the year 2003. A total of nine parasite species were found. Gills of spiny eel were infected with *Ichthyophthirius multifiliis*, *Trichodina pediculus* (protozoa) and *Mastacembelocleidus heteranchorus* (monogenea). *Argulus foliaceus* and an unknown *Argulus* species were found on both the skin and gills of the specimens. Adult stages of *Lernaea cyprinacea* were observed on the skin and copepodid stage of this parasite observed on the gills (crustacean). An unknown coelozoic cestode, *Polyonchobothrium* sp. was recovered from the intestine, *Diplostomum spathaceum* (metacercaria) from the lens and *Contracaecum* sp. from the intestine wall of the infected specimens. Except *Contracaecum* sp. (nematoda), which was reported previously, other parasitic species mentioned in this study are reported for the first time from Iran. General prevalence of parasitic infection in specimens obtained from Zarivar lake is also recorded.

Key words: Parasite fauna, Spiny eel, Iran

Introduction

The spiny eels (Mastacembelidae) inhabit the freshwaters from Africa to eastward to Korea and Malaysia and include 5 genera and 74 species (Froese and Pauly, 2004). Mastacembelid species generally are found at high altitude as well as in low land in both still and running waters (Woo, 1995). One of them, *Mastacembelus mastacembelus* is widespread in the Tigris river and some other rivers (Karoon, Karkheh and Kor rivers) and lakes (Parishan and Zarivar) situated in southwestern Iran. Among parasite species reported in this survey, only a nematode *Contracaecum* larva has been previously reported by Mokhayer (1981b), who found a heavy infection caused by this nematode in the intestinal wall of fish host in Parishan lake. Recently, Kritsky *et al*. (2004) redescribed *Mastacembelocleidus heteranchorus* parasite (Kulkarni, 1969) from the gills of *Mastacembelus armatus* in Lucknow, India and *M. mastacembelus* (new host record) from the environs of Erbil, Iraq (new locality record). In this paper, various body organs of *M. mastacembelus* obtained from Tigris water system of Iran, were investigated in detail to determine their parasitic composition.

Materials and Methods

Fifty specimens of spiny eel *M. mastacembelus* (25-45 cm long) were collected during spring and summer 2003 from three localities of Iran, namely Parishan lake in Fars province (two specimens), Heleh river in Booshehr province (two specimens) and mainly from Zarivar lake in Kurdistan province (forty-six specimens) all belong to Tigris water system. The specimens were examined for

parasitological purposes.

Hosts name were provided by FishBase (Froese and Pauly, 2004). Then, all specimens were fixed in 4% formalin and transferred to the Zoological Institute of the Slovak Academy of Sciences (Dr J. Holcik) for confirmation.

Methods used for collecting, fixing, staining and mounting of the parasite specimens were as follows:

Ciliate: To detect ciliates, collected samples of mucus (separately from the skin, fin and gills) were examined as fresh mounts (Lom and Dykova, 1992). For permanent preparation, both wet and dry smears were mounted in Canada balsam after dehydration in accordance with Fernando *et al*. (1972).

Monogenea: Worms were removed from the existed gills and fixed under a coverslip in ammonium picrate according to Gussev (1983). Line drawing and measurements of scelerotized organs were made from the screen of a computer, projected there upon a video camera. Validity of this method was checked by measuring the same organs with micrometer microscope.

Digenea: Metacercaria from the lens were collected in a 0.6% saline solution; the methods of staining, mounting and illustrating were the same as those described by Fernando *et al*. (1972).

Cestoda: Live cestoda specimens were collected from the intestine of the infected fish; the methods of staining, mounting and illustrating of cestoda were similar to those described by Fernando *et al*. (1972) and Roberts (2001).

Crustacea: Specimens of crustaceans were collected from skin, fins and gills; the methods of staining, mounting and illustrating crustacean were similar to those described by Fernando *et al*. (1972).

Identification of parasites was carried out in accordance with the methods given by Gussev (1985), Lom and Dykova (1992), Jalali (1998) and in the case of monogeneans by Kritsky *et al*. (2004).

Data on parasites collected from fish hosts (only for those specimens obtained from Zarivar lake) were maintained, processed and analysed to determine the prevalence of infection for parasitic genera. The prevalence of infection is the frequency of the infection in hosts by the parasites expressed as percentage.

Results

Nine parasite species were recorded and identified during the present investigation (Table 1).

Discussion

Most of the parasites found in this survey are generally occurring in other fish hosts as well. The only exception is the monogenoid *M. heteranchorus*, which appeared to be a specific parasite of *M. mastacembelus*.

In an article written by Kritsky *et al*. (2004) on Indian and Iraqi material, they classified these species in the new genus *Mastacembelocleidus* and identified them as two species, namely *M. bam* (Tripathi, 1959)

Table 1: Parasitocoenosis of spiny eel in Iran

Parasite groups	Parasite species	Microenvironment(s)	Locality	Prevalence %
Protozoa	*Trichodina pediculus* (Muller, 1786) Fig. 1	Gills	Zarivar lake	2.4
	Ichthyophthirius multifiliis (Fouquet, 1876)	Gills	Zarivar lake	2.4
Monogenea	*Mastacembelocleidus heteranchorus* (Kulkarni, 1969) Fig. 2	Gills	Zarivar lake	100
		Gills	Heleh river	
		Gills	Parishan lake	
Digenea	*Diplostomum spathaceum* (metacercaria) (Rudolphi, 1819) Fig. 3	Lens of eyes	Zarivar lake	2.4
Crustacea	*Argulus foliaceus* (Linnaeus, 1758)	Gills and skin	Zarivar lake	2.4
	Argulus sp. (Mueller, 1785)	Gills and skin	Zarivar lake	2.4
	Lernaea cyprinacea (adult) (Linnaeus, 1758)	Skin	Zarivar lake	2.4
	Lernaea sp. (copepodid stage) (Linnaeus, 1758)	Gills	Zarivar lake	2.4
Cestoda	*Polyonchobothrium* sp. (Diesing, 1854) Figs. 4 and 5	Intestine	Zarivar lake	6.5
Nematoda	*Contracaecum* sp. (Railliet and Henry, 1912)	Intestinal wall	Parishan lake	---

Fig. 1: *Trichodina pediculus* (×1000)

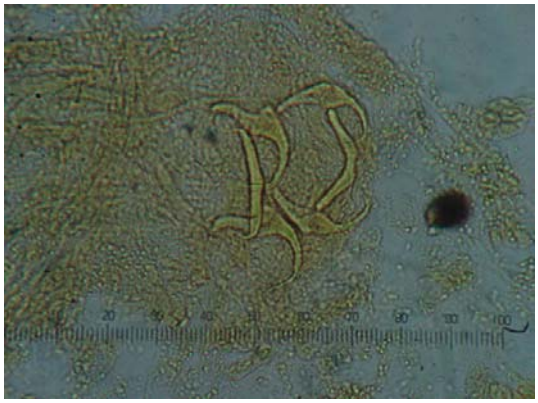

Fig. 2: *Mastacembelocleidus heteranchorus* (×100)

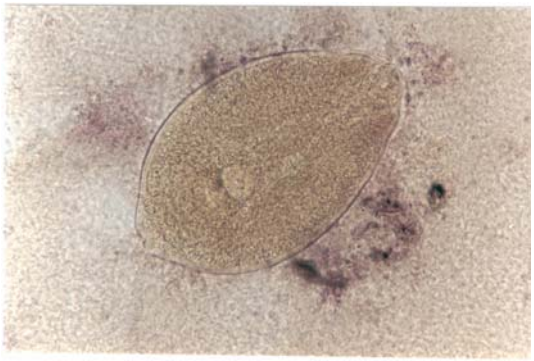

Fig. 3: *Diplostomum spathaceum* (×100)

and *M. heteranchorus* (Kulkarni, 1969). *M. heteranchorus* was first found in India on *M. armatus* (Lacepéde), but recently it was also detected in *M. mastacembelus* (Banks et Solander) in Iraq. *M. mastacembelus* belongs to the Tigris-Euphrates water system, which belongs to our localities. Based on the common locality, and similar morphology and characteristics redescribed by Kritsky *et al*. (2004), the monogenean species were identified with *M. heteranchorus* (Kulkarni, 1969). Although the general prevalence of infection was

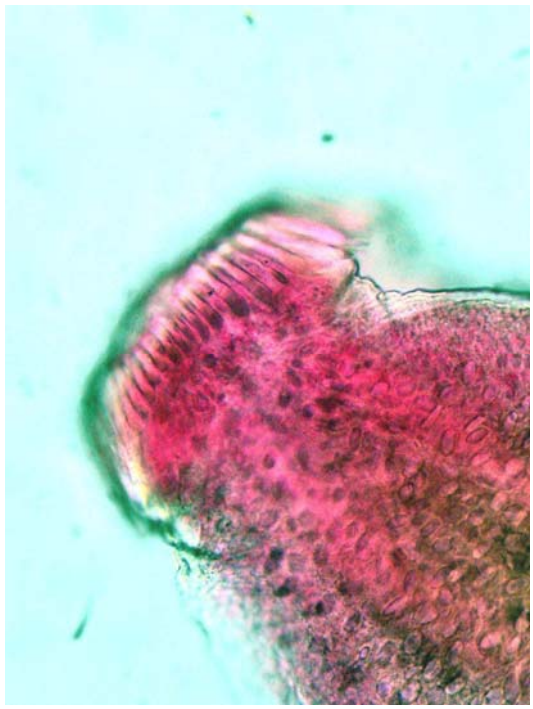

Fig. 4: Scolex of *Polyonchobothrium* sp. (note to the single row of hooks) (×1000)

Fig. 5: Umbrelliform scolex of *Polyonchobothrium* sp. (×400)

100%, but the low intensity indicates the low fish population (Fig. 2).

Diplostomum spathaceum metacercaria is a less pronounced host specific but strongly organ and site specific parasite, which has been reported from more than 125 fish species (Woo, 1995). This parasite was also found in the lens of 2.4% of the examined hosts *M. Mastascembelus*, which was established as a new second

intermediate host in this study (Fig. 3).

Relatively few species of the genus *Polyonchobothrium* are described so far. Rehana and Mujib (1979) reported a new species *Polyonchobothrium* (*Senga*) *striatus* from *Ophicephalus striatus* and also redescribed *Polyonchobothrium* (*Senga*) *lucknaensis* from *Mastacembelus pancalus* obtained from Kalari lake (Pakistan). The species reported here identified as *Polyonchobothrium* sp. by apical rounded disc of pear shaped (umbrelliform) scolex (Fig. 4), which armed with rows of hooks along edge with the general prevalence of 6.5% (Fig. 5).

According to Kabata (1985), about 100 species out of more than 150 species of Branchiura belong to the genus *Argulus.* During our survey, two species of *Argulus* were found on the gills and skin of the hosts. They were differentiated from each other by their morphological structures of maxilla II in cephalothoraxes, urosome with rounded lobes and covered marginally with small spins.

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