www.roavs.com EISSN: 2223-0343
RESEARCH OPINIONS IN ANIMAL & VETERINARY SCIENCES

Intensity and prevalence of internal parasitic Trematods infected of Sole fish, *Brachirus orientalis* (Bloch and Schneider, 1801) in the Persian Gulf

Bagherpour A., Soltani, M. and Tavana, M.

Department of Veterinary, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran

Abstract

This study was conducted to identify intestinal Trematod parasites. The helminthes fauna were collected from body cavity and intestines of 108 specimens of *Brachirus orientalis* which were obtained from Abadan port (waterfront) during the years 2009-2010. Most of the two species of Trematods were found in the intestine and body cavity of the examined fish. The Trematods found were *Lepocreadioides zebrine* and *Allocreadium brachirusii* in the intestine. The general prevalence of Lepocreadioides was 58 and 73% respectively in the intestine. Both of the parasite species found in this study have been reported for the first time from Iran.

Keywords: Trematod; intestine; *Brachirus orientalis*; Persian Gulf; Iran

To cite this article: Bagherpour A, Soltani M and Tavana M, 2012. Intensity and prevalence of internal parasitic trematods infected of sole fish, *Brachirus orientalis* (Bloch and Schneider, 1801) in the Persian Gulf. Res. Opin. Anim. Vet. Sci., 2(7), 443-448.

Introduction

Flat fish is one of the most diversified fishes (Yasemi et al., 2008). This order is one of the most significant species among near coast commercial fish resources. Bottom trawls on the inner continental shelf is the major catching method of this species. They are categorized as high valued species in the world (Nelson, 2006). This order is widely distributed in the Persian Gulf and Oman Sea (Iran Fisheries Organization, 2009).

The pattern of food and feeding habits of *Brachirus orientalis* was studied by Mohammad et al. (1993). Geffen et al. (2007) reported that it feeds predominantly on bottom-living invertebrates, especially small crustaceans.

The maximum total length of the species is about 30 cm **(**Mohammad and Honda, 1998). Distribution of these fish are common in most tropical coastal waters of the Indo-West Pacific area from Gulf of Thailand northward to Taiwan and southern Japan, southward through the Philippines, New Guinea to north-central Australia (both coasts); westward to India and the Persian Gulf (Menon, 1978).

Marine fish parasites have received little attention in Iran until recent studies of helminthes (Peighan and Hoghoghi, 2004; Peighan et al., 2006; Abdi, 2010), but in the neighbouring countries many of fish parasites in this region were reported by Khalil and Polling (1997) from Kuwait and Emirates (Sey et al., 2003). Mandani (1994) reported the Trypanorhynchus larva in flesh of flat fishes from the Persian Gulf. Amin et al. (1984) found Acanthocephal *Neoechinorhynchida* and *Serrasentis sagittifer* from flatfish intestines in Kuwait shores. Ahmad et al. (1987) also reported *Lasiotocus guptai* from intestine of flat fish in the Arabian Sea. Nahhas et al. (2002) reported *Erilepturus hamati* in flat fish intestines originated from Kuwait shores in the Persian Gulf. Gonzales et al. (2001) reported 12 parasite species in big eye flat fishes from northern Chile. Alkuwari (2000) found two species of digenetic trematodes which have been identified as *Treptodemus latus* and *Chauhantrema spiniacetabulum.* According to Saoud et al. (1986) 18 identified genera of digenetic trematodes were recorded for the first time in the Persian Gulf. Shimazu et al. (2000) reported *Allocreadium patogonicum* (Alloocreadiidae) from the intestine of *Percichthys colhuapiensis* and *Percichthys*

Corresponding author: Bagherpour A, Department of Veterinary, Shoushtar Branch, Islamic Azad University, Shoushtar, Iran

trucha in Argentina. Richard and Abu Tweb (2002) reported 8 species of order Plagiorchiida, Allocreadioidea Superfamily and Allocreadiidae Family. Sheng-fa et al. (2010) reported five species of genus Lepocradidae (Trematoda) from Chinese marine fish. Bray and Gibson (1989) reported a new species, *Neolepidapedon smithi* of the Lepocreadiidae (Digenea) family. The helminthes fauna found in the intestine of 108 specimens of *Brachirus orientalis* were obtained from the Persian Gulf. Fresh catch specimens of Sole fish were acquired from Abadan port during spring 2008 to winter 2009 in the Persian Gulf, Iran. The objective of this study was to identify intestinal Trematodes parasites in sole fish in Persian Gulf.

Materials and Methods

Both commercial and non-commercial sized fish (18-40cm) were collected, these collected fish were kept on ice and brought to the laboratory of Aquatic Department, Faculty of Veterinary Science, Chamran University. An Iranian ichthyologist in accordance with Etemad and Mokhayer (1979) carried out identification of fish host. The methods and techniques used for collection, relaxation, fixation, staining and mounting of helminthes are basically those described by Hanek and Fernando (1972) and Roberts (2001).

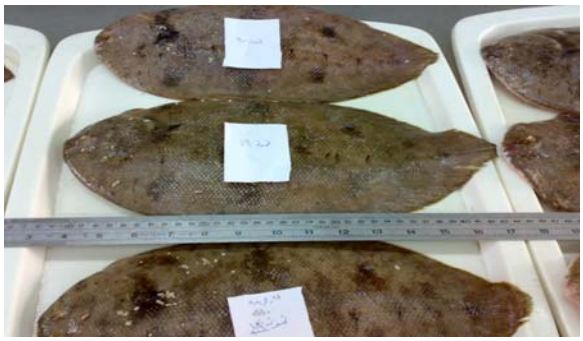

Fig. 1: *Brachirus orientalis* (Soleidae)

Each fish was measured, the total length to nearest 0.1cm, the total weight to nearest 10 g and the sex was determined internally. Fishes were examined only for internal parasites, each fish was opened and the intestines were fully examined for parasites. The abdominal cavity of each fish was cut open and the intestine was separated from the other visceral organs and placed in a Petri-dish containing physiological saline and the helminthes were found with loop. The digeneans were washed in a 0.6% saline solution and fixed in 70% ethanol alcohol. They were stained with alum carmine, dehydrated and then cleaned in xylene and mounted in Canada balsam for nematodes. Fish were dissected and the intestine and body cavity were observed carefully and nematodes were collected from the fish intestine and washed in saline (0.6%-0.8%). With the nematode kept extended, they were fixed in 76% alcohol and cleaned in lacto phenol for seasonal days. Permanent mount was made using azocarmin stain and the identification of parasites was carried out according to the method described by Gussev (1985), Moravec (1994) and Yamaguti (1971). Prevalence and mean intensity were calculated according to the definition given by Bush et al. (1997). Measurements expressed in micrometers. Drawings were prepared by Camera Lucida and photographs were taken by a Canon digital camera (A1000).

Results

The material collected during the present investigation was used for identification of the helminthes fauna currently occurring on *Brachirus orientalis* in Abadan, and also for estimation of the prevalence and intensity of infestation of fish. All four helminthes were found in body cavity and intestine of dissected fish.

Trematodes

Lepocreadioides zebrini found in intestine had 58% prevalence (Table 2). *Zebrias zebrinus* distinguished from the closely related Lepocreadium by the position of the genital pore. This helminth has a cirrus sac with small valve and all measurements are given in Table 4 and for first time reported from Persian Gulf (Fig. 2 & 3).

Allocreadium in intestine had 73% prevalence (Table 2). This Trematods has a cirrus sac in double folding and all measurements are given in table 4 and this species for the first time is reported from Persian Gulf (Fig 4, 5).

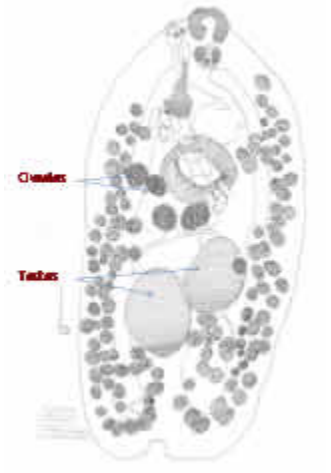

Fig 2: *Lepocreadioides zebrine*

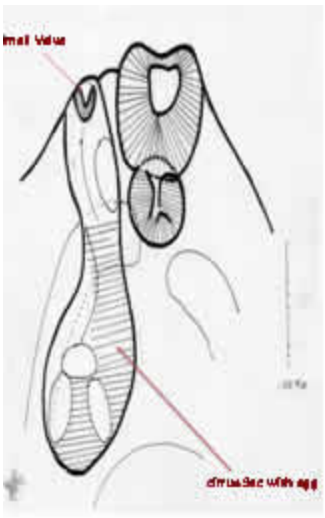

Fig 3: cirrus sac L.zebrini

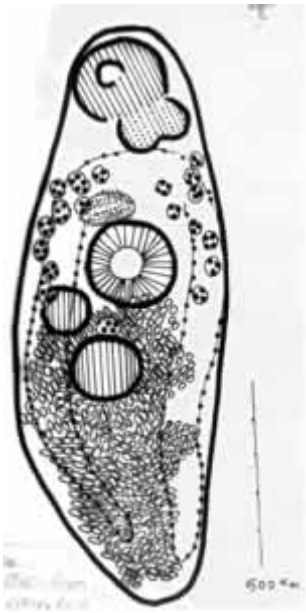

Fig 4: Allocreadium (New species)

Discussion

In the present study, prevalence of the infection of Trematodes according to Abdi (2010) was examined. The highest prevalence by trematodes was in spring and the lowest was in autumn. These results may be due to the climate of the Persian Gulf, having hot weather in summer and autumn which makes parasites unable to live in this climate, but in spring the weather is very suitable for the growth of parasites.

Fischer and Kelso (1990) reported that parasite loads increased quickly in spring, and nearly all juvenile fishes over 25 mm long supported a parasite fauna by *Proteocephalus*. The prevalence and intensity of the helminthes' infection from the intestine and body cavity of the fish examined in summer did not increase in larger fish. The intermediate hosts of *H. aduncum* have been known to be marine molluscs, annelids and arthropods (Yoshinaga, 1987). Pure infections with Trematodes were common but similar infections with nematodes and cestodes were less frequent (Saoud, 1986). Prevalence and mean intensity of *Trematodes* in the present study were higher than the mentioned result in Szostakowska and Sulgostowska (2001) from southern Baltic in Herring fishes, but the maximum prevalence was in spring. Szostakowska and Sulgostowska (2001) reported the high prevalence of *Trematodes* infection in Baltic herring *Clupea haerengus* from the southern Baltic sea in spring. Lepocreadiidae family was found in all seasons with a high prevalence and mean intensity in Flounder fish from the Gulf of Gdansk (Chibani and Rokicki, 2004), but in the present study the prevalence was lower than Chibani, the lowest prevalence and intensity in both cycles was in summer which was similar to our study.

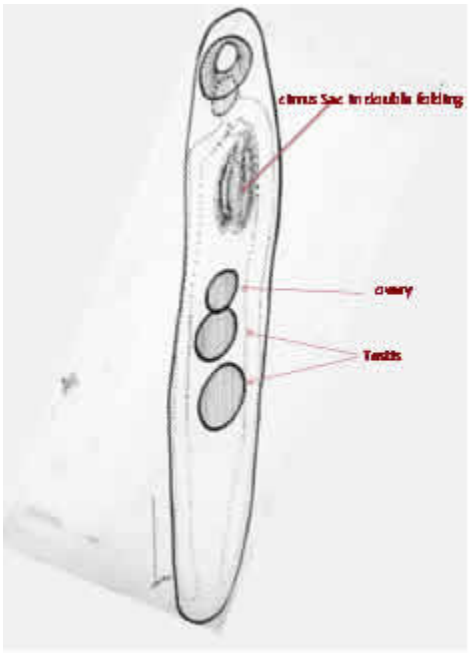

Fig 5: Cirrus sac Allocreadium sp

Berenice et al. (2009) reported *Acanthogalea gibsoni* (Digenea, Yamaguti, 1936). *L. zebrini* from *Zebrias zebrinus* is distinguished from the closely related Lepocreadium by the position of the genital poreiidae (from *Balistes vetula)*, one of the genus of the Lepocreadiidae family, captured from surrounding waters in the state of Rio de Janeiro. The prevalence was lower than the present study. Dyer et al. (1998) reported *Lepocreadium trulla* from marine fish (*Ocyrus chysurus*) with a mean intensity lower than the present

Table 1: Helminthes species in flounder fishes in the Persian Gulf

Parasites	Locality (ies)	helminthes	Catching site (s)	Reference (s)
Erilepturus hamati	Intestine	Trematode	Kuwait waters	Nahhas et al. (2002)
Lasitocus guptai	Intestine	Trematode	Arabian sea	Ahmad et al. (1987)
Lepocreadioides zebrini	Intestine	Trematode	Persian Gulf	Present survey
Allocreadium Brachirusi	Intestine	Trematode	Persian Gulf	Present survey

Table 2: Prevalence of Internal parasites in examined fishes in north of Persian Golf

Parasites	Fish infected	Fish uninfected	Prevalence (%)
Allocreadium Sp	79	21	73
Lepocreadioides zebrini	63	37	58

Table 3: Prevalence of different of helminthes in Black sole in Persian Gulf 2009-10

Parasites	Spring (%)	Summer (%)	Autumn (%)	Winter (%)
Allocreadium Sp	92	84	48	68
Lepocreadioides zebrine	76	74	28	52

Table 4: Measurements of Allocreadium sp and Lepocreadioides zebrini

Species	Measurement
Allocreadium sp	
Eggs	10×15-65×50(33×25)
Pharynx	40×40-162×125(93×76)
Ventral sucker	70×72-212×200(135×124)
Oral sucker	80×70-223×182(143×129)
Ovary	110×100-50×45(95×90)
Testes	170×150-80×70(130-120)
Body width	150-550(297)
Body length	454-1625(915.5)
Lepocreadioides zebrine	
Eggs	25×30-40×40(35.8×32)
Pharynx	15.2×18.3-65×80(44×53)
Ventral sucker	39.8×37.6-185×225(118.2×152.5)
Oral sucker	43×45-77×90(45.9×51)
Ovary	90×70-65×60(70×65)
Testes	230×190-150×140(200×165)
Body width	400-645.8(541.9)
Body length	790-1187.5(969.1)

study in Paraguera of Puerto Rico. Members of Lepocreadiidae are recognizable as worms with widely distributed vitelline follicles, aspinous tegument, usually with a distinct external seminal vesicle and a typically I–shaped excretory vesicle (Bray, 2005). The influence of diet preferences in macroparasite infection levels of 7 Soleidae along the Portuguese coast has been examined by Marques et al. (2006) and these authors found that most of the variation of prevalence and mean abundance was related to the type and quantity of food ingested as well as habitat use. The excretory vesicle winding between the testes seem to relate it more to the genus *Lepocreadioides* (Yamaguti, 1936). *Lepocreadioides,* however, has a cirrus sac and a genital pore far to the left and far anterior. *L. zebrini* (Yamaguti, 1936) and *L. branchiostegi* (Yamaguti, 1937) both have excretory vesicles extending anterior to the acetabulum, but in *L. indicum* (Srivastava, 1941) the vesicle extends only to the ovary (Manter, 1954).

In conclusion, both of the parasite species found in this study have been reported for the first time from Iran. This study will provide base for the future studies on these new species of fish.

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