ABSTRACT
This study was conducted to identify intestinal helminthes parasites and Survey of correlation between this helminthes with sex, season and size of Marine fishes in North of Persian Gulf in Abadan harbor. The helminthes fauna is collected from body cavity and intestine of 100 specimens, Brachirus orientalis obtained from Abadan harbor were investigated during the year 2013-2014. A lot of 4 species of helminthes were found in intestine and body cavity of examined fishes. The helminthes found was composed by 2 digeneric Trematodes (Lepocreadioides zebrine, Allocreadium brachirusii) all in adult state in intestine. A statistically significant correlation was observed between the fish parasites with sex and weight of fish in Lepocreadioides zebrine (P=0.03) and no significant correlation between the fish parasites with weight of fish in Allocreadium brachirusii, one nematode Hysterohylacium aduncum that the prevalence was 23% the only cestod Protocephalus sp with 16%. Except Protocephalus sp which was reported previously often parasites species found in this study are reported for the first time from Iran. There is no significant correlation between the fish parasites with sex and weight of fish in Protocephalus sp (Sig>0.05).

KEY WORDS: Brachirus orientalis, Intestine parasites, Iran, Persian gulf, Sex, Season, Size

INTRODUCTION
Almost 60% of flat fish are caught from Khuzestan. These fish has been captured in Abadan in which is the most important port of Khuzestan and this study has done in this harbor. The Flounder fish contained 6 families, 117 genus and 538 species. 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 value species in the world (Nelson, 2006). The pattern of food and feeding habits of Brachirus orientalis were studied during the period April 1987 to June 1988 by Khan et al. (1993). The food content consisted of annelids (2.82%), crustaceans (14.23%), molluscs (17.85%), platy-helminthes (4.16%), nematohelminthes (4.70%), fish (3.09%), sand grains (30.07%) and miscellaneous food items such as semi-digested parts of fish, crustaceans, and shells etc. (56.51%). The food and feeding habits varied with reference to season (Khan et al., 1993). Geffen et al. (2007) reported it Feeds predominantly on bottom-living invertebrates, especially small crustaceans. Ambicoloration is an abnormality described in flatfishes, (Carnikian et al., 2006). The maximum total length of the species is about 30 cm, commonly 10 to 12 cm (Khan and Shamsulhoda., 1998). Flatfish metamorphosis includes a unique physical characters with morphological and physiological changes associated with eye migration, a 90° rotation in posture and asymmetrical pigmentation (Geffen et al, 2007).

Distribution of these fish are Common throughout most tropical coastal waters of 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 Persian Gulf. (Menon, 1978). Marine fish parasites have received little attention in Iran until recently studies of helminthes Parasitology have been developed in recent years (Peihan and Hoghoghri, 2004; Peihan et al., 2006; Abdi, 2010). But in neighboring countries many of fish parasites in this region were reported by Khalil and Polling. (1997) and some researchers from Kuwait and Emirates Sey et al. (2003) the objective of this study was to identify intestinal helminthes parasites Mandani, Peiman. (1994) reported the Trypanorhynchus larva in flesh of flat fishes from Persian Gulf.

Amin et al. (1984) have found Acanthocephal Neoechinorhynchida and serrasentis sagittifer from flatfish intestine in Kuwait shores. Ahmad et al. (1987) have also reported Lasiotocus guptai from intestine of flat fish in Arabic Sea. Nahhas et al. (2002) have reported Eripleturus Hamati in flat fish intestine originated from Kuwait shores in Persian Gulf. Gonzales et al.(2001) have reported 12 parasite species in big eye flat fishes from northern chili which 7 species...
were internal parasites; Digens from Hemiuridae family and Cestodes, *Floridosentis sp* *Corynosoma australe* and *Neobothriocephalus adspinosus*. Oliva et al. (1996) have reported nematodes; *Capillaria sp*, *Anisakis sp*, *Philometra sp*, *Nybelinia surmenicola* in *Paralichthys adspersus* which is a type of flat fish. Alkuwari (2000) from Qatari waters was found to be infected with 2 species of digenetic trematodes these have been identified as *Treptodemus latus* and *chauhantrema spinacetabulum*. According to Saoud et al. (1986) identified 18 genera of digenetic trematodes are recorded for the first time in the Persian Gulf.

Bray and Gibson (1989) reported a new species, *Neolepidapedon smithi* of the family of the Lepocreadiidae (Digenea), it is described from the fish *Mora moro* in the north-eastern Atlantic Ocean and is distinguished from other members of the genus. Lile (1998) have reported Eighteen species of helminths were analysed in relation to host–parasite specificity and the effect of host ecological preferences on the establishment of the parasite fauna in the alimentary tract of four flatfish.

**MATERIALS AND METHODS**

A total of 100 Black sole fish, *B orientalis*, were obtained from Abadan ports, during February 2013 to January 2014. Both commercial and noncommercial sized fish (18–40cm) were collected, collected fish kept on ice and were brought to the laboratory of Aquatic Department, Faculty of Veterinary Science, Chamran University. Identification of fish host was carried out by an Iranian Ichthyologist in accordance with Etemad and Mokhayer (1979). 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). Each fish was measured, total length to nearest 0.1cm, 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 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 were made by using azocarmin stains. The identification of parasites was carried out according to keys given by Gussev. (1985), Moravec. (1994) and Yamaguti (1971). Prevalence and mean intensity were calculated according to definitions given by Bush et al. (1997). Measurements are expressed in micrometers and in parentheses are calculated for those species with measurements done on three specimens; numbers are rounded to the nearest decimal. Drawings were prepared by Camera lucida and photographs 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 area examined, and also for estimation of the prevalence and intensity of infestation of fish. In all 4 helminthes were found in body cavity and intestine of dissected fish. The following helminthes found are as followed.

**Trematodes**

Lepocreadioides zebrini Yamaguti, 1936 in intestine. General prevalence 58% and Mean Intensity is 4.65 parasites in a fish. Yamaguti 1936 describes and figures two new species of Lepocreadiidae family from marine fishes *l.zebrini* from *Zebrias zebrinus*, distinguished from the closely related Lepocreadium by the position of the genital pore.

This helminthes have a cirrus sac with small valve and all measurements are given in table4 with micrometer and for first one have reported from Persian Gulf , Allocreadiud sp Looss, 1894 in intestine general prevalence 73% and Mean intensity is 2.03 parasites in a fish. This helminthes has a cirrus sac in double folding and this species for the first time reported from Persian Gulf.
Diagram 1: Correlation between sex and the number of parasites

Diagram 2: Correlation between size and the number of parasites

Allocreadium sp Looss, 1894 (New species) in intestine general prevalence 73% (table2) and Mean intensity according to table6 is 2.03 parasites in a fish. This helminthes has a cirrus sac in double folding and all Measurements are given in table 4 and this species for the first time reported from Persian Gulf.
Diagram 3: Correlation between size and the number of parasites

Diagram 4: Correlation between sex and the number of parasites

*Nematode H. auctum* (syn. *H. aduncum*) is a common nematode occurring in many regions of the world in the fish of sea and brackish waters. Hartwich (1975). *Hysterothylacium aduncum* Rudolphi, 1802 is known as a parasitic nematode of marine fishes, which act either as final or paratenic host. Adult worms and larvae are found in the alimentary canal and in the body cavity, respectively. No case of human infection with the nematode has been reported (Yoshinaga, 1987). *H. aduncum* have 2 Telogonic ovaries. Larvae encysted third-stage larvae and adult was found in intestine of examined fish. Mentions parasite, typically occurring in several flatfishes in European sea Szostakowska and Sulgostowska (2001). *Hysterothylacium aduncum* was a common species reported in flounder from the Baltic Sea in various seasons by Sulgostowska et al. (1987), in present study General prevalence 23% (table2) and Mean intensity according to table6 was 1.16 Parasites in a fish. All measurements are given in table5 with micrometer.

Protocephaulus sp Weinland, 1858 the only cestod which was found in examined fishes. Sculex has five suckers. General prevalence 16% Mean intensity 1.5 parasites in a fish measurements of scolex in this Cestoda were 165×170-185×200(170×175). Recently, Azadikhah (2009) the parasites species in *silususglanis* in Aras reservoir and describe the pathological changes caused by scolex in attaching site of intestine of infected fish.
DISCUSSION
In the present study, prevalence of the infection by Trematodes according to Abdi (2010) that highest prevalence by trematodes was in spring and the lowest prevalence by trematodes was in autumn. These result caused by the climate of Persian Gulf, that have hot weather in summer and autumn so the parasites couldn’t live in this climate but in spring the weather was very adequate for parasites. Probably highest prevalence infection by nematodes was in spring and the lowest prevalence was in summer that the climate inadequate for parasites. Fischer and Kelso (1990) have reported that Parasite loads increased quickly in spring, and nearly all the juvenile fishes over 25 mm long supported a parasite fauna by Proteocephalus (Cestoda) in present study parasite load was in winter by proteocephalus. The infection of Gobid species with Proteocephalus was small and prevalence was the lower than present studies Kvach (2005) especially in winter that the prevalence in our study was highest and in summer parasites were not found. In intestine and body cavity of examined fishes in summer. Both prevalence and intensity of the infection of these helminthes not increased in larger sized fish. The intermediate hosts of H. aduncum have been known to be marine molluscs, annelids and arthropods (Yoshinaga, 1987). Pure infection with Trematodes were common but similar infection with nematodes and cestodes were less frequent (Saoud, 1986). Prevalence and mean intensity of Hysterothylacium aduncum in present study in all of the reason were higher than mentions result in Szostakowska and Sulgostowska (2001) from southern
Baltic in Herring fishes but in maximum prevalence was in spring for this parasite and about this matter both of the study were similar to each other. Szostakowska and Sulgostowska (2001) reported the high prevalence of *H. aduncum* infection in Baltic herring *Clupea harengus* from the southern Baltic Sea in spring.

*Hysterophylacium aduncum* was found in all the seasons with high prevalence and mean intensity in Flounder fish from the Gulf of Gdansk Chibani and Rokicki (2004) but in present study prevalence was lower than Chibani, the lowest prevalence and intensity in both cycles was in summer in similar to our study. *Hysterophylacium aduncum* is a parasite that is not very host-specific in either the larval or adult stages Chibani and Rokicki (2004). Berenice et al. (2009) reported *Acanthogalea gibsoni* (Digenea, Lepocreadiidae) from *Balistes vetula*, one of the genus of the Lepocreadiidae family were captured from surrounding waters in state of Rio de Janeiro, that the prevalence was lower than present study.

Dyer et al. (1998) reported *Lepocreadium trulla* from Marine Fishes, *Ocyrus chrysurus* with Mean intensity lower than present study in paragura of Puerto Rico. Members of Lepocreadiidae are recognizable as worms with widely distributed vitelline folicles, 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 much of the variation of prevalence and mean abundance was related to the type and quantity of food ingested as well as by 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. branchiosstegi* 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).

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Peighan, R., Hoghoghi Rad, N. and Mesbah, M. (1867) (Pleuronectiformes) from Northern Chile (Family: Soleidae) from Karachi coast.

Mohammed Atiqullah Khan and S.M. Shamsul Hoda. (bl. and schn.) (Family: Soleidae) from Karachi coast.


