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Majid AA Bannai

Aquaculture and marine
fisheries, Marine Science Center,
Basra University, Iraq

Essa T Muhammad

Aquaculture and marine
fisheries, Marine Science Center,
Basra University, Iraq

Fatimah Ataby

Collage of science, University of
Thiagar,
Iraq

New host record of *Dujardinascaris sphyraenaii* (Bilqees *et al.*, 1977). (Nematode: Heterocheilidae) parasitism in the *Psettodes erumei* fish, with note on the pathology of infection North West of Arabian gulf, Iraq

Majid AA Bannai, Essa T Muhammad, Fatimah Ataby

Abstract

New host and geographic distribution of *Dujardinascaris sphyraenaii* is recorded as nematode parasite in the *Psettodes erumei* fishes in Arabian gulf, The histopathological lesions were manifested as chronic gastroenteritis with diffuse and granulomatous lesions in the liver, The infected liver grossly appeared abnormal due to its darker color and slightly swelling of the site of attachment of the worm hepatopancreatic necrosis and fatty degeneration. Pathological lesions of nematode parasitic manifestation of infected are observed, Most of tissue were abnormal with the erosion and necrosis in some region. Fishes were collected from Arabian Gulf. 61 samples were examined for parasites during the year 2015; the infection rate was 100% during all seasons of the year. The parasitic infestations were identified morphologically as Nematode, Genus: *Dujardinascaris sphyraenaii* Baylis, 1947 Anisakis simplex third stage larva.

Keywords: Nematode, *Dujardinascaris*, *Psettodes erumei* fish, Arabian Gulf, Iraq

1. Introduction

Psettodes erumei is considered as one of the most important fish species in the Arabian Gulf as it is used as seafood at fish markets.

Nematode, Genus: *Dujardinascaris sphyraenaii* Baylis, 1947 are invertebrate round worms, they are elongated, cylindrical form with unsegment body, The diseases occur due to the adult and larval nematodes which are very common in marine fishes, The nematode parasites infect various tissues and organs of fish such as stomach, intestine, liver, gonads, visceral mesenteries, peritoneum body cavity, blood vessels, swim bladder, and connective tissues, fin, orbits of the eye and brain Most species of the nematodes in adult stage live in the alimentary canal except the family Philometridae which are found in body cavity, liver and gonads (Akater, 2008) [1]. And *Philometroides* spp. cause chronic active ulcerative dermatitis, *Philometra* sp. may encyst within the testes cause trauma from migrating of this parasite, Moreover, *Philometra* is found in the ovaries as well as testis and although there may be little effect on egg production, in some cases there is hemorrhage, fibrosis, and increased number of melanomacrophages (Fergusonm,1989) [5].

In Iraq many studies has been analyzed on the nematode parasite in the Arabian gulf fishes, about 45 species are described, and the genus *Dujardinascaris* are register the first time in Arabian gulf fishes.

2. Material and Methods

1. Study area

Fishes were collected from the from Khor –Abdulla North west Arabian Gulf Water, south of Iraq (latitudes 47° 30' to 48° 15'; longitude 30° 50' to 30° 00') about 100 km south of Basra (Fig. 1) by fishermen using michnical tral net.

2. Collection and examination of specimens for parasites

A total of 61 fishes of *Psettodes erumei* were collected. Period of samples collection was from March 2014 to October 2014. The fresh specimens were immediately examined for helminthes parasites. The weights were taken with the help of the digital weighing balance;

Correspondence

Majid bannai

Aquaculture and marine
fisheries, Marine Science Center,
Basra University, Iraq

Their average weight was 500-969g. The fishes were dissected and the alimentary canals were removed and cut into parts in physiological saline for parasite recovery. The intestines were further carefully split Open longitudinally to aid the emergence of the gastrointestinal helminthes parasites. The recovered helminthes parasites were fixed in formalin. They were counted and recorded.

3. Identification of parasites

All the recovered gastrointestinal helminthes parasites were sorted out into their various groups (Cestodes, trematode and nematodes) and isolated the nematode parasite for this study.

The parasites were preserved and fixed in 70% alcohol. The parasite samples were transferred to vials, thoroughly sealed and labeled with code names. Some samples were identified using Yamaguti (1971) [13].

4. Histopathology techniques

Samples from gastro-intestinal tract were taken from freshly dead fishes. The

Specimens were fixed. Histological studies of the infected and normal liver were carefully removed and weighed and thereafter it was washed out in saline water to remove blood and use freezing microtome for section.

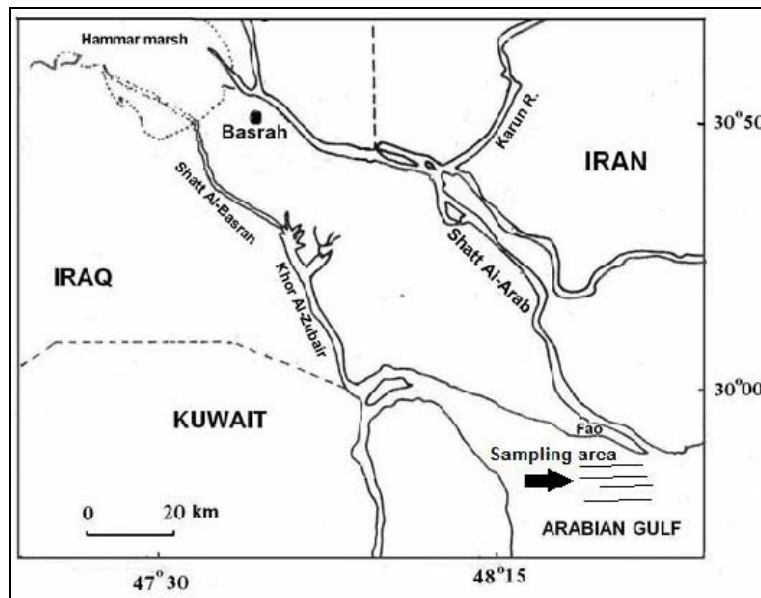


Fig. 1: The Map of studying area.

3. Result

Dujardinascaris (Fig. 1)

- Order : Ascarididea
- Family : Heterocheilidae
- Sub family : Filocapsularinae
- Genus : *Dujardinascaris sphyraenaii*

Dujardinascaris Bilqees *et al.*, 1977

Site of infection: liver and intestinal

Male: (10 specimens). The nematode larvae were relatively large in size and not encapsulated, medium-sized, dark brown worms, body length 22-24(23) without spicules and 22.65-24.78(23.73) with spicules. Mouth bounded by three lips, Body is sparsely striated. Nerve ring is at a distance of 0.33-

0.35 from anterior end.

Intestinal caecum is 1.61-1.66 in length. 15 pairs of caudal papillae are present including 11 pairs preanal, 2 pairs postanal and 2 adanal. Two equal spicules are present, 0.66-0.72 in length. Histopathology section relived that mostly lesions were present in the superficial tissue of the liver, and it appears dark in the section. The results of the present study showed that changes in the Prevalence and intensity of the infection during the period of the study. As the incidence where the highest infection during the seventh month and declined during the fourth month and 9-month of the study, while the intensity of infection are varied by year table 1

Table 1: shows the Prevalence and Mean intensity of infection with years

Months	Number of fish examined	Number of fish infected	Prevalence	Mean intensity	No of parasite
March	9	5	55.3	2.6	13
April	12	4	33.3	1.5	6
May	8	3	37.5	1.3	4
June	7	6	85.7	1.3	8
July	7	7	100	0.85	6
August	8	3	37.5	1.66	5
September	6	2	33.3	3	4
October	4	2	50	2	4

The infected liver grossly appeared abnormal due to its darker color and slightly swelling of the site of attachment of the worm,. Most of tissue were abnormal with the erosion and

necrosis.in some region cellular infiltration in much sxtansite but infiltration was not prominent around tissue worm (Fig 3).

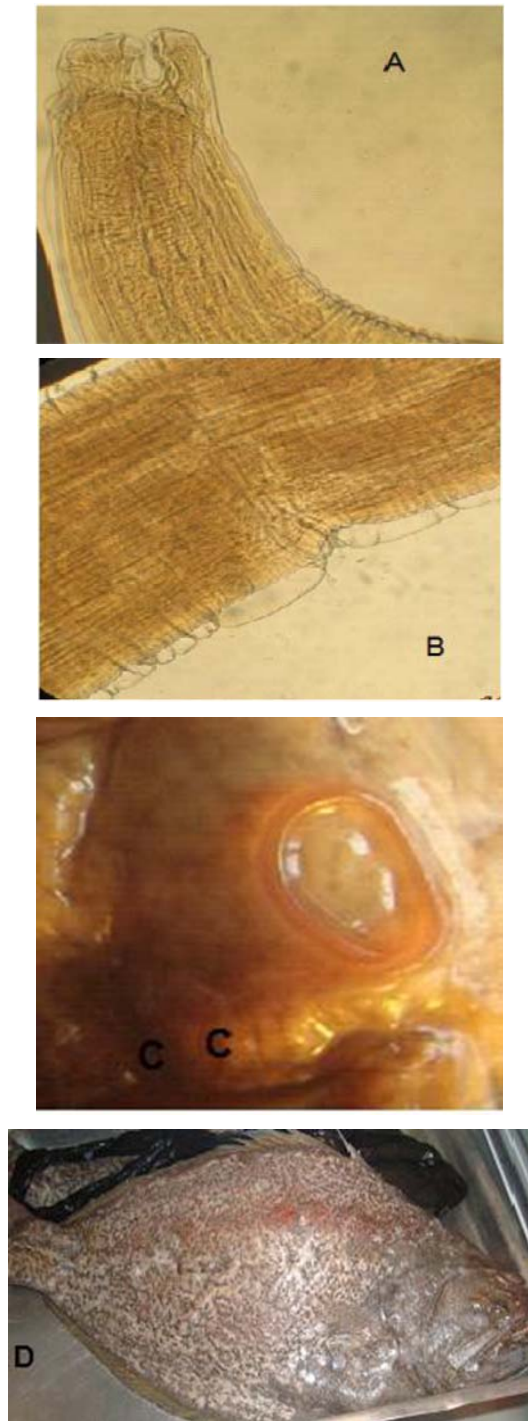


Fig 2: larval stage of *Dujardinascaris sphyraenaii*, ventral view A, B; C male parasite *Dujardinascaris* encysted in the liver, D *Psettodes erumei* fishes



Fig 3: section on the tissue infected with larval stage of *Dujardinascaris sphyraenaii*

4. Discussion

The genus *Dujardinascaris* Baylis, 1947 includes a total of 20 species. All *Dujardinascaris* spp. is host specific; 18 species parasitize exclusively crocodilians and two species parasitize fish (Sprent, 1977; Sprent *et al.* 1998; Moravec & Jirků 2014) [1, 12, 9]. In Africa and Madagascar, Sprent (1977) [11], Sprent *et al.* (1998) [12] had listed five *Dujardinascaris* spp. in the Nile crocodile *C. niloticus* (including cryptic *C. suchus*), African slender snouted crocodile *Mecistops cataphractus* (Cuvier, 1825) and the African dwarf crocodile *Osteolaemus tetraspis* Cope, 1861: *D. dujardini* (Travassos, 1920); *D. gedoelsti* Sprent, 1977; *D. puylaerti* Sprent, 1977; *D. petterae* Sprent, McKeown & Cremin, 1998 and *D. madagascariensis* Chabaud & Caballero, 1966. Among these, *D. madagascariensis* was Originally described by Chabaud & Caballero (1966) as the subspecies *D. dujardini* madagascariensis but Sprent (1977) [11]. Gave it species status.

Sood (1989) had presented a key to the species of *Dujardinascaris* Baylis 1947 reported from fishes in South Asia. Five species have been listed under the genus *Dujardinascaris* by Sood (1989) namely; *D. magna* (Khan & Begum, 1971), in *Sciaena* sp. from Karachi coast; *D. ritai* (Zaidi & Khan, 1975) in *Rita rita* of fresh water fish from Lahore, *D. quadrii* (Zubari and Farooq, 1976) from *Sciaena* sp., from Karachi coast; *D. Sciaena* (Bilqees *et al.*, 1977) [2] in *Sciaena diacanthus* from Karachi coast, *D. cybii* (Arya and Johnson, 1978) from fish *Cybbium guttatum* from India. Lakshmi and Sudha (2000) give notes on *D. cybii* Arya and Johnson from a new host *Mugil cephalus*. Bilqees *et al.*, 2004 [3, 4] describe *D. karachiensis* from *Pomadasys olivaceum* from Karachi coast.

D. sphyraenaii of the present study is very similar to those of (Bilqees *et al.*, 1977) [2] specimens, and represent as new host and geographic distribution in Arabian Gulf, and *Psettodes erumei* fishes a new host recorded.

The histopathological study of the infected fishes revealed that there is chronic severe necrotic hepatitis with Hemorrhages and destruction of the pancreatic tissue around the parasite. This alternation in the infected tissues could be a direct result of the attachment of the parasites to the wall of the gastrointestinal tract which causes damage, degeneration and inflammatory reactions in the infected tissues and the adjacent tissues which requires further studies.

Nematode larvae are more harmful than adults and can penetrate into the tissues of various organs, causing severe tissue damage and destruction of the cells of the organ (Akhtar, 2008) [1]. Ascarididans (Order Ascaridida) are reported to parasitize fish and cephalopods (Purivirojkul, 2009) [10]. Their larval stage occurs in the internal organ or maybe digestive tracts of marine fish. Pathogenesis is a result of their mode of feeding, attachment and movement or migration within the host (Akhtar, 2008) [1]. The infected intestine by the nematode parasites causes destruction, atrophy of intestinal mucosa, necrosis and degeneration of the intestinal tissue, causing damage to the whole thickness of the bowel wall due to nematode larvae (Ferguson, 1989) [5]. The result in agreements with all studies above.

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