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Study on Some Types of Parasitic Nematodes, *Anisakis simplex*, *Contraecaecum multipapllatium* and *Hysterothylacium aduncum* Affecting Fish, *Mullus surmuletus* in the Beach City of Sirte-Libya.

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ABSTRACT

This study was conducted on 50 samples of fish, *Mullus surmuletus* collected from the beach of the city of Sirte – Libya during the period from March to May 2019 , and after dissecting the fish samples using special autopsy tools and examining them well "in the laboratory, the examination showed that 22 fish were infected with some types of parasitic nematodes : 5 fishes were infected with a parasite *Anisakis simplex* that was collected from the intestine, and 11 of these fishes were infected with a parasite *Contraecaecum multipapllatium* , which was collected from and thus is the most widespread parasite in these fish under study. the results also showed that 6 of these fishes were infected with a parasite *Hysterothylacium aduncum* , which was collected from the stomach and intestines of these fishes.

INTRODUCTION

Fish meat of high nutritional value because it contains a high percentage of amino acids and minerals essential for human nutrition as well as it contains vitamins and few saturated fats (Salman, 2000). Aline and Jose (1999) were interested in studying parasitic diseases that affect the productivity of fish wealth as well as parasitic diseases that are transmitted to humans and animals and fish are considered hosts for them or are part of the life cycle of many of them.

Fish parasites are important biological indicators indicating the separation and location of fish for example, in the case of fish migration in the seasons of the year from one place to another, every place visited by fish acquires a type of parasite that indicates the environment and thus parasites have become evidence of annual migrations and knowledge of habits, behavior, reproduction and life cycles for fish (Marcelo and Cormona, 2001).

Fish are infected with parasites as a result of eating intermediate hosts crustaceans the feeding of these fish increases in seasons in which the numbers of these intermediate hosts increase (Azhar *et al.*, 2012).

We have to study these parasites affecting this type of fish to see the degree of environmental pollution in these parasites in Sirte – Libya.

MATERIALS AND METHODS

Fish samples:50 fresh *Mullus surmuletus* were collected from the shore of the city of Sirte – Libya in the period from March to May 2019. Various measurements were taken for all samples from measuring length and weight in severe infestations, nematodes are prominent outside, after that, the dissection of the fish begins using special dissecting tools.

The cutting starts from the outlet opening towards the head of the fish, then we ascend by cutting to the top along the gills, then we open the fish, the fish's digestive system was removed and divided, and each part was cut inside a Petri dish containing a saline solution at a concentration of 5% after that, the body cavity was examined with the naked eye and with a magnifying glass.

The contents of each pate were examined with a magnifying glass and examined under a light microscope, after that, the detected nematodes were extracted using an affine brush and placed in lactophenol for minutes after which it was placed on a glass slide and covered with the slide cover and examined under a light microscope with different enlargement powers to complete the studies on it.

RESULTS

Several parasites belonging to the nematodes have been extracted from the *Mullus surmuletus* fish.

Anisakis simplex:

Extracted from the intestine and the number of fish infected with this pharynx of the nerve ring is located at the front end of the body. The excretory opening is located at the front end of the body there is a prominence like a tooth at the front of the head (Fig. 1). the male is distinguished by its curved end towards the ventral side it contains two spines of unequal length (Fig. 2), while the posterior end of the female is

flat and does not contain spines, nor is it located in the anterior third of the body.

Hysterothylacium aduncum:

This parasite was extracted from the stomach and intestine of the fish and the number of infected fish was 6 fish, this parasite is characterized by the presence of the vertical fin and the male is shorter than the female, the nerve ring is located at the front end of the body (Fig. 3). The tail of the male is twisted towards the ventral side and carries a number of small thorns with a number of caudal papillae while the back end of the female is flat (Fig. 4).

Contracaecum multipapillatum:

It was extracted from the body cavity and the digestive system of the *Mullus surmuletus* fish and the number of fishes infected with this parasite is 11 fishes and is therefore considered the most common in the names under study. the head contains three lips surrounding the mouth opening, one dorsal and two lateral ventricles with a small papilla in each lip. the esophagus is divided into a part. the muscular anterior and glandular posterior part, which is in the shape of the letter 5 and this is what distinguishes this parasite. the nerve ring is located at the area of the pharynx connection with the muscular esophagus (Fig. 5). The male contains a caudal fin. the male contains unequal spicules at its posterior end. the female is longer than the male and the posterior end of the female is straight and vulva at the front of the body (Fig. 6).

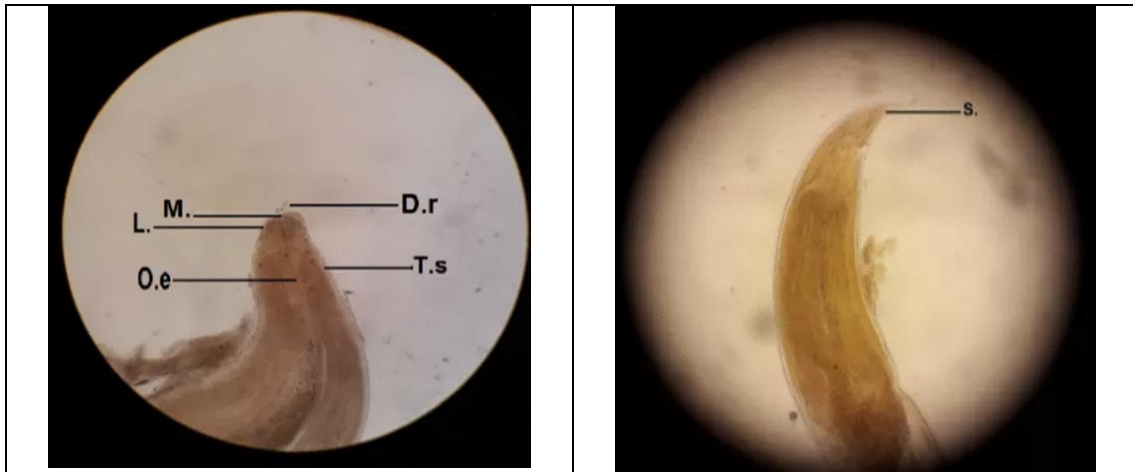


Fig.1: Anterior region of *Anisakis simplex*. D.r : Dentigerous ridge ,T.s :Transverse striation ,M:Mouth, L:Lip ,O.e: Oesophagus

Fig. 2: Posterior region of *Anisakis simplex*. S: Spicule

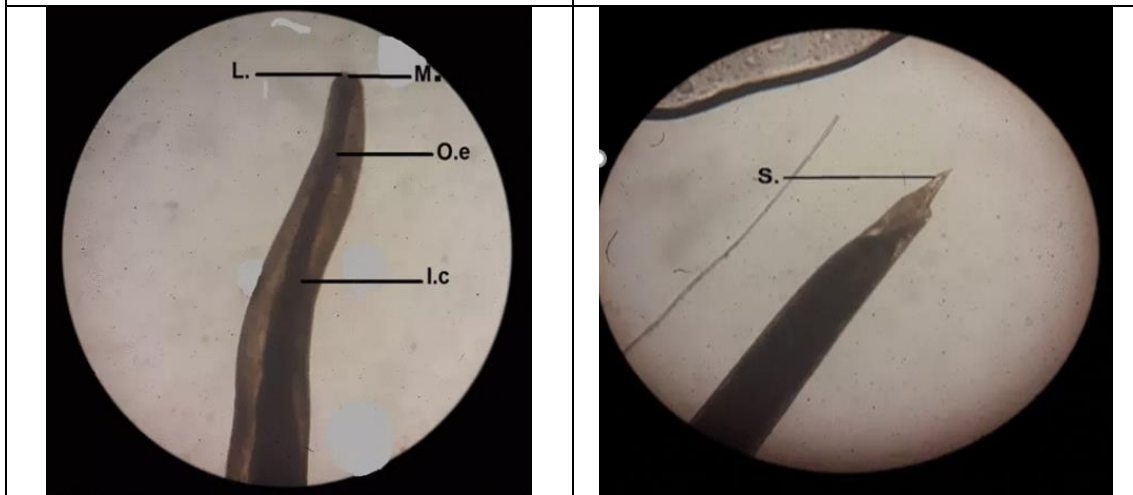


Fig. 3: Anterior region of *Hysterothylacium aduncum* .L: Lip, M: Mouth, O.e: Oesophagus, I.c: Intestinal caecum

Fig.4: Posterior region of *Hysterothylacium aduncum* . S : Spicule .

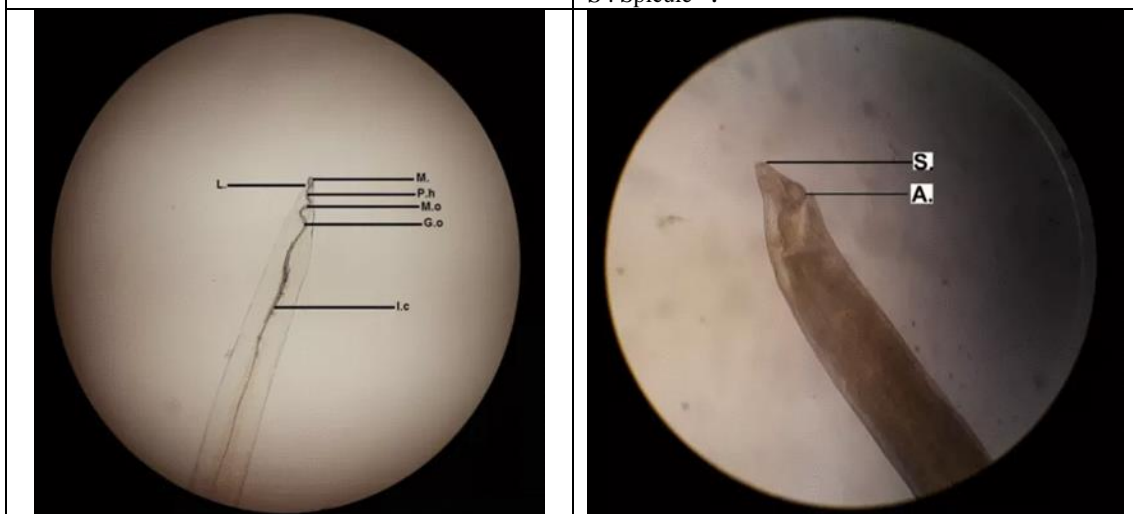


Fig.5: Anterior region of *Contracaecum multipapillatum* . M: Mouth, P.h: Parynx , M.O : Muscular oesophagus , G.o : Glandular oesophagus , I.c : Intestinal caecum .

Fig.6: Posterior region of *Contracaecum multipapillatum*. S: Spicule, A: Anus

DISCUSSION

The topic of the research deals with one of the important problems affecting fisheries, specifically the *Mullus surmuletus* fish related to the infection of these fish with parasitic worms in the region of Sirte – Libya during the period from April to June 2019. 50 fish were collected and after examined, it was found that 5 were infected fishes with a parasite *Anisakis simplex* extracted from the fish intestine, 11 fish were infected with a parasite *Contracaecum multipapillatum* that was extracted from the intestine, and 6 fishes were infected with a parasite *Hysterothylacium aduncum* in the stomach and intestine, and the number of infected fish was 22 fish, and the most infected was with a parasite *Contracaecum multipapillatum*.

In the study of fish, *Coryphaena hippurus* the rate of infection of these fish with the parasite *Anisakis simplex* was found to be 33.3% (Cabrera *et al.*, 2002).

Consumers ingesting raw or undercooked fish products. clinical symptoms associated with the infection termed anisakidosis, vary from irritation of oesophagus and stomach, via nausea, vomiting and diarrhea to severe epigastric and abdominal pain (Kurt and Foojan , 2016).

A total of 816 marine fishes belonging to four different fish species were examined for the presence of anisakid larvae, four species of anisakids were identified, *Anisakis* typical, *Phocanema decipiens*, *Porrocaecum recipient* and *Hysterothylacium aduncum* horse mackerel (*Trachurus mediterraneus*). Mediterranean silverside sand smelt (*Atherina* species), red porgy (*Pagrus* species) and Lizardfish (*Saurida undosquamis*) was 92.31%, 72.80%, 59.09%, and 43.43%, respectively (Nada and Amany , 2011).

Anisakiasis (anisakidosis) refers to a foodborne zoonosis caused by ingesting raw or undercooked marine fish or cephalopods infected with anisakid larvae, the overall

prevalence of anisakid larvae was 19.5% and *Anisakis pegreffii* 54.9%, *Hysterothylacium aduncum* 21.5% (Taehe *et al.*, 2019).

The stomach content analysis of salmonids revealed that trout *Oncorhynchus mykiss* which are most liable to carry *H. aduncum*, feed considerably on natural organisms, less so with coho salmon *O. kisutch* and almost not at all in Atlantic salmon *Salmo salar* which are not infected (Laura, 1998).

In a study conducted on 200 fish 100 samples of *Tilapia* and 100 samples of Catfish in Minia Governorate in Egypt, it was found that *Tilapia* and Catfish were infected with a parasite *Contracaecum multipapillatum* at a rate of 5% and 20%, respectively, (Yehea *et al.*, 2019).

The highest rate of parasite *Hysterothylacium aduncum* infection was in the summer, which amounted to 25% in the digestive system of *Gugg* fish *Sparus aurata* in the marine waters of Lattakia coast from October 2015 to September 2016 (Tagreed, 2018).

A study conducted on 165 marine fish, which included 68 samples of *Mullus* fish, 77 samples of *Epinephellus* fish, and 20 samples of *Pagrus* fish in the city of Sirte – Libya during the period from May to October 2005 the results showed that *Mullus* fish and *Pagrus* were infected with a parasite *Anisakis* in the intestine and body cavity at infection rates of 9.4% and 15% respectively. the results also showed that *Mullus* fish and *Pagrus* were infected with a parasite in the intestine and stomach of these fish with infection rates of 11.8% and 10%, respectively and the results also showed infection of *Mullus* fish with a parasite *Contracaecum multipapillatum* in the intestine and body cavity, with an infection rate of 2.9% (Ahmed, 2005).

Larvae of *C. multipapillatum* penetrate the intestine of the fish and enter various abdominal organs where they become encapsulated and continue to develop, the ventricular appendix serves as a

pumping organ to aid in the ingestion of blood (Hary , 1967) .

Contracaecum osculum in marine finfishes as adults in Japanese waters, before *C.osculatum* was discovered in 1998, larval nematodes .have been recorded from 13 species of teleosts and six species of pinnipeds. respectively (Kazuya, 2012)

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