

## **A study on ( *Acanthocephala: Echinorhynchus gadi* ) that infects *Mullus surmuletus* fish in the marine waters of Sirte – Libya .**

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### **Abstract**

Sirte is characterized by an important geographical location overlooking the Mediterranean coast , this sea is full of many fish species , which are important hosts for many parasites , and due to the lack of research studies in this region and on these parasites that infect fish, this study was conducted on the species of Certain parasites that infect *Mullus surmuletus*.

A number of (70) fish specimens were collected from Sirte - Libyan coast facing Mediterranean Sea from January 2021 to March 2021 , and the measurements were made on them all marine fish examined externally in the laboratory, after that they were dissected by the scientific methods used and examined internally, as well as the digestive system was examined and conducted on parasites extracted by all the processes related to study . Worms were examined and under the microscope, The results showed that 10 samples (14.28%) of these fish were infected with *Acanthocephala*) worms of species *Echinorhynchus gadi* .

**Key words** :*Acanthocephala* , *Neoechinorhynchus* ,*Echinorhynchus gadi* ,Sirte.Libya

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### **Introduction**

The fish is an indicator of the environmental condition and is important for man as a good source of protein in the diet of human and in contrast is a source for some of the vibrations of animal diseases originated (Rewaida and Hewaydah ,2020)

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 .

Fish parasites are important biological indicators indicating the separation and location of fish for example, in the case of fish migration 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 et al., 2001).

This study aims to know the rate of infestation of *Mullus surmuletus* fish with *Acanthocephala* (*Echinorhynchus gadi*) extracted from the marine waters of Sirte- Libya, as well as this study aims to know the general form of these worms.

### **Materials and methods**

Fish samples :70 fresh *Mullus surmuletus* were collected from the shore of the city of Sirte-Libya in the period from January 2021 to March 2021.

The fish samples were transported to the laboratory , Zoology department and the length was measured and the weight was calculated for each sample .

After that, the fish were examined externally with the naked eye, then started dissecting the sample using special dissection tools, starting from the anus to the front side of the fish near the gills, then moving the cut goes upwards along the gills.

Then the fish was opened and examined internally with the naked eye as well as using a magnifying lens, then we take out the internal viscera of the fish and distribute them on Petri dishes containing distilled water.

The extracted (*Acanthocephala*) are placed in tap water and placed in the refrigerator for 24 hours at a temperature of 5C-10C in order to relax and protrude their proboscis.

Then they were placed in ethanol 70%, after which they are placed in lacto-phenol for 10 minutes to clarify their parts, then staining and examination under the microscope.

### **Results**

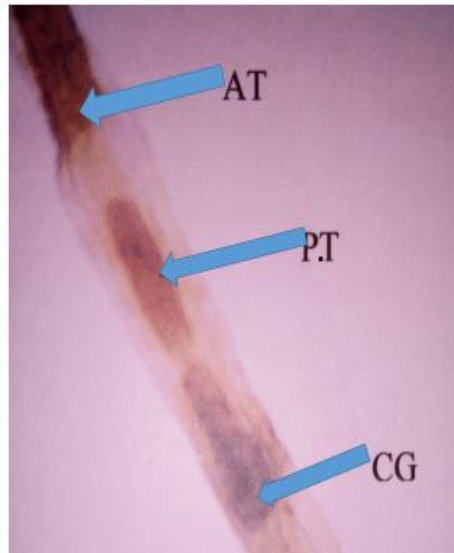
One *Acanthocephala* (*Echinorhynchus gadi*) was extracted from the intestines of *Mullus surmuletus* fish . After the examination, it was found that ten fish (14.28)

out of the (70) samples that were examined from the *Mullus surmuletus* fish.

All worms had a milk-white color , a smooth surface and cylindrical body trunks at the front end of the worm is the proboscis, which emerges when the worm is relaxed and placed in the water.

The male carries 2 oval-shaped testes located at the posterior end of the worm, one anterior and called the anterior testis and one posterior called the posterior testis with a number of cement glands picture(1) . Proboscis carries a number of hooks arranged in rows, and the end of each hook is sharp .

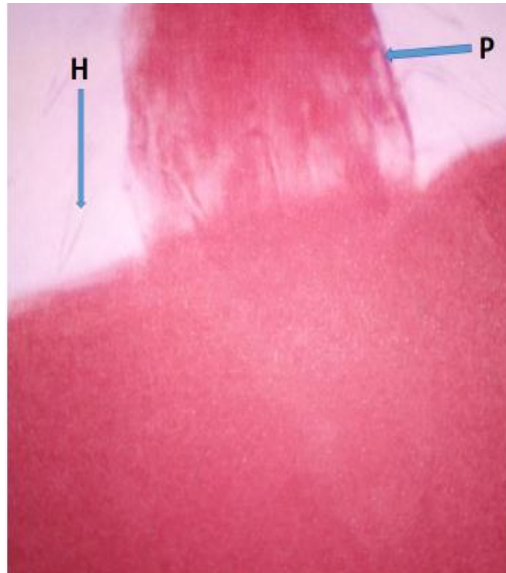
The females are longer than the males, and the number of hooks in the females proboscis is more than the males hooks picture(3) . The vulva is located approximately in the middle of the worm picture(4) . The vagina is muscular and opens at the back of the worm, the uterus is located at the back of the worms body, and the body cavity is filled with fusiform – shaped eggs that are pointed at both ends picture(5) .



**Picture (1):**Posterior region of the male showing the testis .  
A.T: Anterior testis . P.T: Posterior testis . C.G : Cement gland .

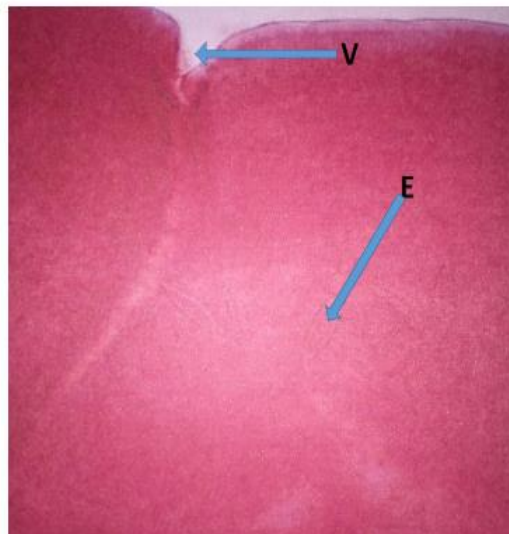


**Picture (2):** Anterior region of the male .



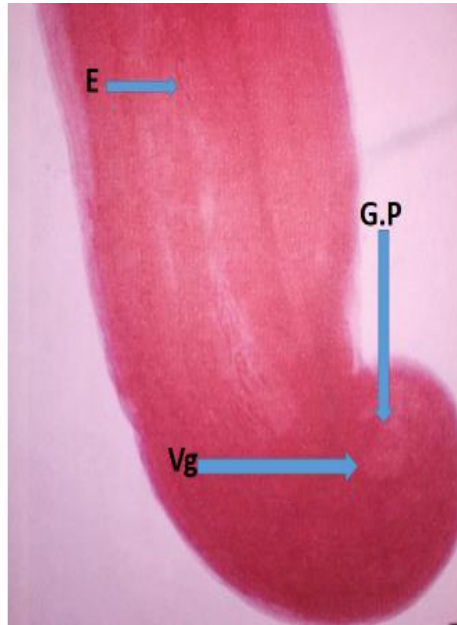
**Picture (3):** Anterior end showing proboscis .

P: Proboscis . H: Hooks



**Picture(4):** Median region of the female showing vulva and eggs

V: Vulva . E: Egg



**Picture(5):** Posterior end of the female .

G.P: Genital pore . Vg: Vagina . E: Egg .

### Discussion

The topic of the research deals with one of the most important problems affecting fisheries, which is the infestation of fish with parasites, specifically *Mullus surmuletus* fish, and the extent of infection with ( *Acanthocephala*) worms on the coast of Sirte-Libya.

A number of 70 samples of *Mullus surmuletus* fish were collected from the marine waters of the city of Sirte, and after dissecting these fish and examining them using the previously mentioned methods, and conducting laboratory operations on the extracted parasitic worm. The results showed that 10 fish were infected with (*Acanthocephala* : *Echinorhynchus gadi*) 14 .28% which were extracted from the intestines of these fish .

*Echinorhynchus gadi* parasite was collected from the intestine of European eel ( *Anguilla Anguilla*) fish collected from the Red Sea water. The infection rate of this parasite was 12.5%. The infection was analyzed according to the seasonal prev-

alence rate . It showed the highest infection during the winter and the lowest rate during the summer ( Rewaid and Hewaydah ,2020) .

The prevalence of *Egymnocypr* in Schizothoracine fish extracted from the Yangize River and Upper Yellow River in China was about 57.69% and they are the final hosts of this parasite (Meng-Tong et al., 2020) .

In a study on the internal parasites that infect fish in the coastal city of AL Khums –Libya, two types of ( *Acanthocephala*) worms, *Ryadinorhynchus pristis* and *R.cololabis*, were identified, which were present in the intestines of the fish with an infection rate of 32.59%( Muhammed et al ., 2019 ).

A type of ( *Acanthocephala*) worm was recorded, which was extracted from the intestines of *Planiliza abu* fish extracted from the Tigris River, with an infection rate of 4.8% (Jabbar,2019).

The infection rate of *Liza abu* and *Sliurus triostegus* fish extracted from the Great Zab River in Erbil with the *Neoechinorhynchus iragensis* extracted from the intestines of these fish was 38.75% and 35.45%, respectively, and the rate of infection of the *Capoeta damascene* fish with the *Neoechinorhynchus zabensis* extracted from the intestines of these fish 3.61% (Dalya et al.,2015) .

The parasite *Echinorhynchus truttae* and *E.bothniensis* is a common parasite of Salmon and other fish in northern Europ (Matthe,2013).

In a study of some endoparasites isolated from freshwater fish of the rough type in AL-Diwaniyah city – Iraq, the results showed that some fish were infected with the ( *Acanthocephala*) worms,*Neoechinorhynchus iraqensis*, which were extracted from fish intestines, with an infection rate of 8.03% ( Azhar et al.,2012 ) .

In the year 2005 A species of *Neoechinorhynchus* was extracted from the intestines of *Micropogonias attpinnis* ( Alava and Aguirre,2005).

The rate of infection with the parasite *Neoechinorhynchus* sp in *Loa Loa* fish was 20% ( Muzzal et al .,2003) .

In a study on the parasite *Neoechinorhynchus cureinai* which was extracted from *Prochilodus* fish in the shores of Brazil, the prevalence rate of this parasite in these fish reached 83.3% ( Martins et al.,2000) .

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