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## كتاب وقائع المحفل العلمي الدولي العاشر

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**Investigation of the parasite *Ooecoeloides furcatus* that infects *Mullus surmuletus* fish in the marine waters of Sirte-Libya**

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التحري عن طفيل ( *Opecoelodes furcatus* ) الذي يصيب أسماك التريليا

( *Mullus surmuletus* ) في المياه البحرية لمدينة سرت – ليبيا

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**Abstract**

The Libyan city of Sirte is characterized by an important geographical location overlooking the coast of the Mediterranean Sea. This coast is full of many fish species, which are important families to complete the life cycle of many parasites, which negatively affect the quality and size of fisheries in the country. It is an indicator of pollution in the region and among the important fish species in this region, which was characterized by the abundance of parasites in it, based on this study are the *Mullus surmuletus* fish, which is a benthic fish

In this study, 70 *Mullus surmuletus* fish were collected from the marine waters of the city of Sirte-Libya in the period from January to March 2021. Fresh fish samples were transferred to the laboratory of the Faculty of Science –University of Sirte – Libya. Various measurements were taken for each sample, and then external examinations were conducted for each sample to observe its phenotypic changes. After that, each sample was dissected by the known scientific method. Various internal examinations were conducted for each sample, and many species of parasitic worms were extracted and their laboratory operations were performed on them, and they were examined under a light microscope. Among the helminthes that were extracted was the *Opecoeloides furcatus* parasite of the trematode, which was extracted from the intestines of the *Mullus surmuletus* fish

This study aims to identify the parasites that infect fish, especially *Mullus surmuletus* fish, which may cause losses in fish wealth in the study area, as well as to know the extent of environmental pollution in the area under study, as these research studies on this subject in the study area are completely non-existent



## الملخص

تتميز مدينة سرت الليبية بموقع جغرافي مهم يطل على ساحل البحر الأبيض المتوسط هذا الساحل المليء بالعديد من الأنواع السمكية والتي تعتبر عوائل مهمة لإكمال دورة حياة العديد من الطفيليات والتي تؤثر سلباً في جودة وحجم الثروة السمكية في البلاد وتعتبر مؤشر من مؤشرات التلوث في المنطقة، ومن بين الأنواع السمكية المهمة في هذه المنطقة والتي تميزت بكثرة الطفيليات فيها هي أسماك التريليا *Mullus surmuletus* وهي من الأسماك القاعية.

في هذه الدراسة تم تجميع عدد 70 سمكة من أسماك التريليا من المياه البحرية لمدينة سرت - ليبيا في الفترة من شهر يناير إلى شهر مارس 2021م. نقلت عينات الأسماك الطازجة إلى معمل قسم علم الحيوان بكلية العلوم - جامعة سرت-ليبيا. تم أخذ القياسات المختلفة لكل عينة وبعد ذلك تم فحص كل عينة خارجياً بالعين المجردة لملاحظة ما بها من إصابات أو أي تغيرات مظهرية، بعد ذلك تم تشريح كل عينة بالطريقة العلمية المعروفة واستخرجت العديد من أنواع الديدان الطفيلية وأجريت عليها العمليات المخبرية الخاصة بها وتم فحصها تحت المجهر الضوئي العادي، من بين الديدان الطفيلية التي تم استخراجها طفيل *Opecoeloides Furcatus* من التريمتودا والذي تم استخراجه من أمعاء سمكة التريليا.

هذه الدراسة تهدف إلى التعرف بالطفيليات التي تصيب الأسماك خاصة أسماك التريليا والتي قد تسبب خسائر في الثروة السمكية في منطقة الدراسة، وكذلك لمعرفة حجم التلوث البيئي في المنطقة قيد الدراسة،

## **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 serve as hosts to a range of parasites that are taxonomically diverse and that exhibit a wide variety of life cycle strategies. Whereas many of these parasites are passed directly between ultimate hosts, others need to navigate through a series of intermediate hosts before reaching a host in (or on) which they can attain sexual maturity. (Barber etal 2000)

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)

Paraguassu *etal.*, (2002) 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 are considered to be intermediate hosts for them or as part of their life cycle

This research aims to identify the parasitic nematodes that infect *Mullus surmuletus* fish and to know the extent of environmental pollution in the study area and the rate of fish infestation, as well as to clarify and studying the general form of these parasitic worms under study

## **Materials and methods**

Sirte is located on the Mediterranean cost approximately 450 Km east of Tripoli. The warmest months of the year are July and August, while the coolest months are January and February

Kingdom: Animalia

Phylum: Choridata

Class: Osteichthyes

Order: Perciforms.



Family: Mullidae.

Genus: Mullus.

*Mullus surmuletus*.

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 transferred to the laboratory 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 is 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 trematode parasites were relaxed for 40-60 minutes in saline solution, and fixed with formal line 10% for 2-4 hrs. Parasites were preserved in 70% Ethyl alcohol containing 5% glycerin for preventing the dryness of the sample and kept in small glasses.

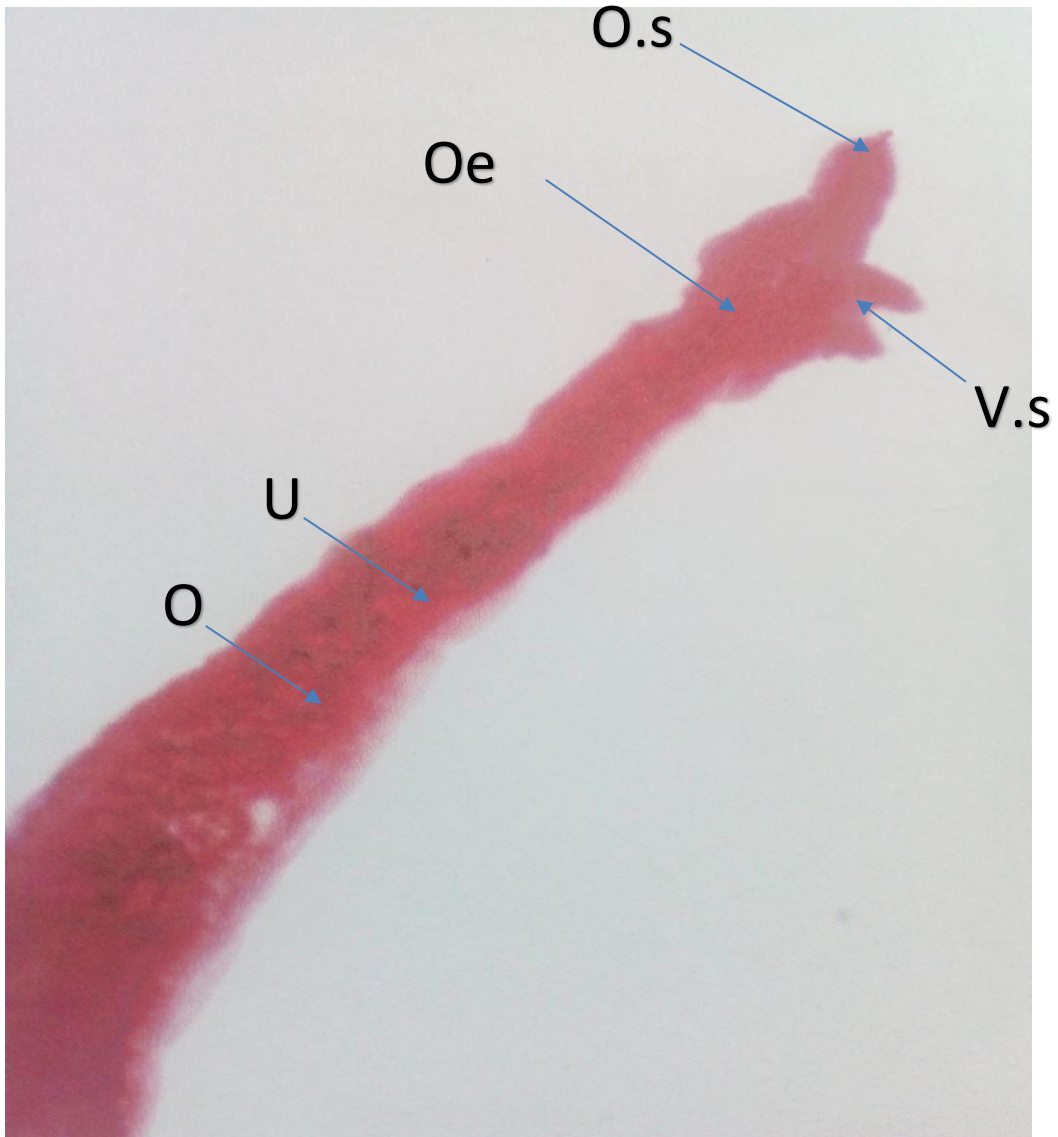
The preserved trematodes were stained in carmine

## Results

This species of trematodes was collected from small intestine of *Mullus surmuletus*. Only one of 70 examined fishes was infected with these trematodes

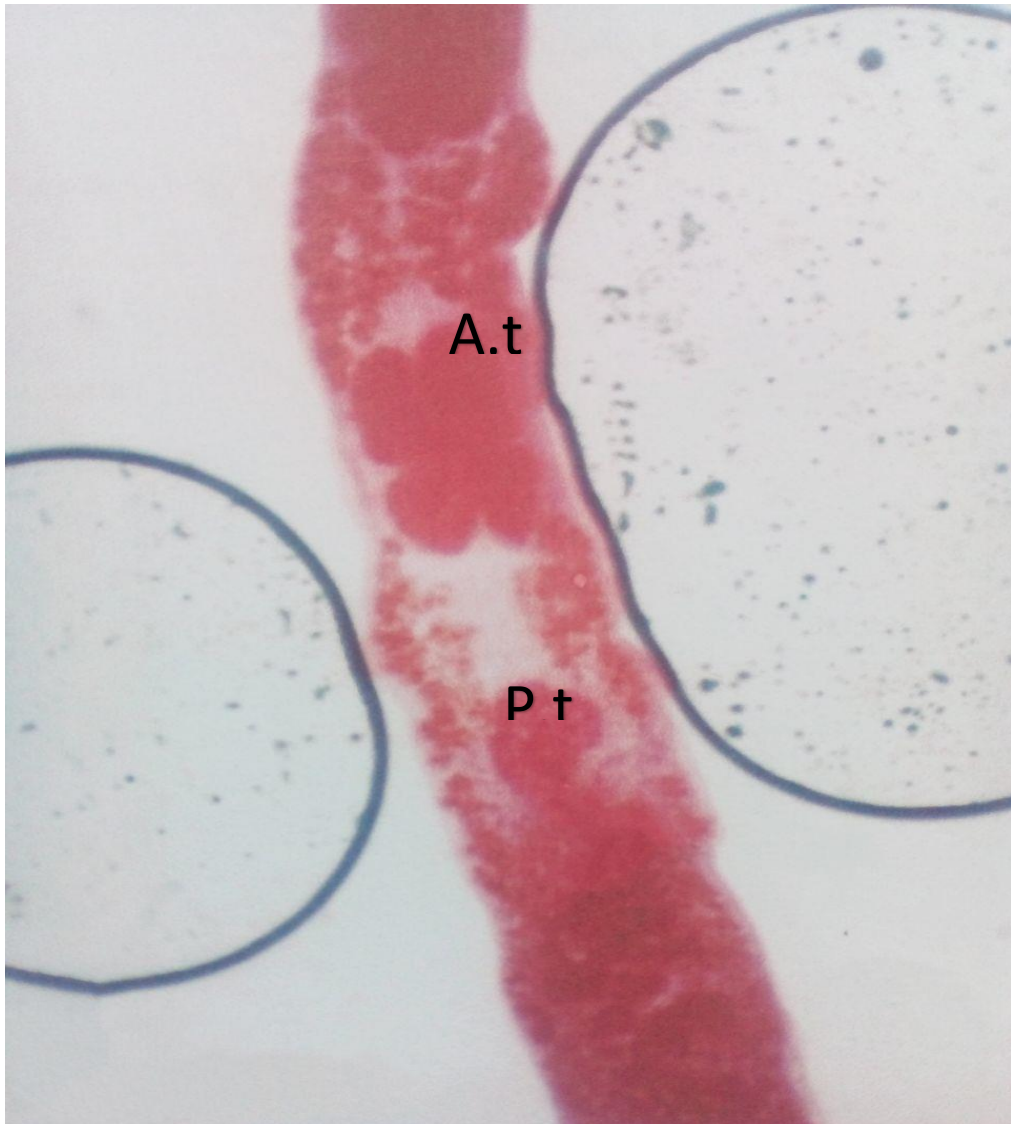
The body is required and cylindrical, has two number of suckers at the anterior end of the body, a prominent oral sucker leading to the pharynx, and ventral sucker separated from the body on peduncle, and it is larger than the oral sucker, the short pharynx leads into a long esophagus. the ceca extend to near the posterior end of the worm. the vitellaria fill the posterior 3/4 of the body  
The testes are located in the posterior of the body and are anterior and posterior testes, the anterior testes are tetra-lobed, while the posterior testes are larger and are penta-lobed

The ovary is located in the middle of the body and in front of the anterior testes. The uterus is long and filled with eggs and is located between the ovary and the ventral sucker. the excretory pore is located at the posterior end of the body.



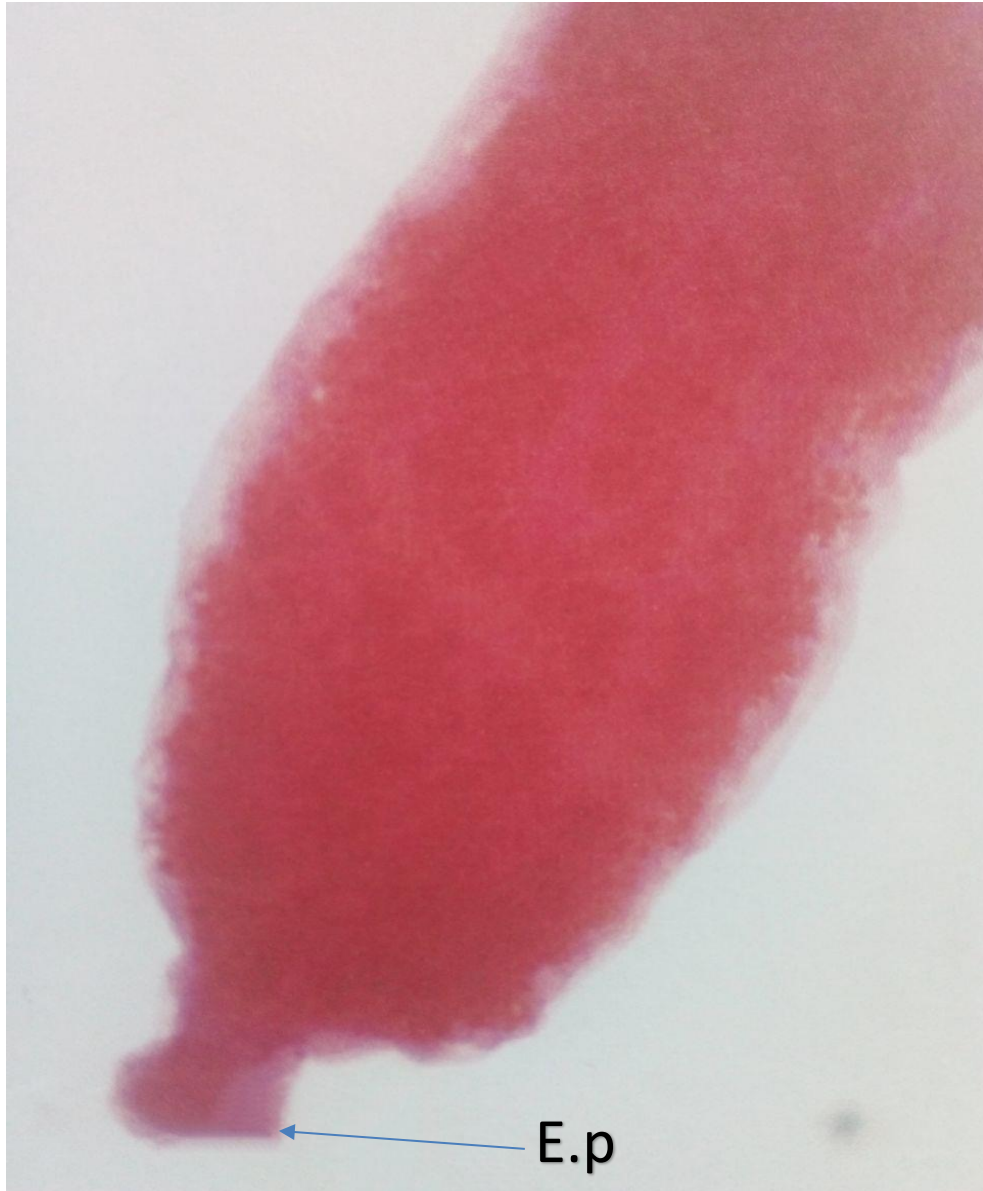
**Figure (1):** Anterior region of *Opecoeloides furcatus*

*O.s:* Oral susker, *V.s:* Ventral susker, *Oe:* Oesophagus, *U:* Uterus, *O:* Ovary.



**Figure (2):** Median region of *Opacoeloides furcatus*.

*A.t:* Anterior testes, *P.t:* Posterior testes.



**Figure (3):** Posterior region of *Opicoeloides furcatus*.

*E.p:* Excretory pore.





## Discussion

A total of 167 red mullets (*Mullus surmuletus*) from four geographical locations (North Sea, Ligurian Sea, Tyrrhenian Sea, Adriatic Sea) were studied for metazoan parasites and food composition. The digeneans *Opecoeloides furcatus*, *Timonia mediterranea* and the nematode *Ascarophis valentina* occurred only in the Mediterranean fish. (Klimpel *et al.*, 2008)

We announce, for the first time in Algeria the Digeneans *Aphallus tubarium*, *Derogenes varicus*, *Derogenes latus*, *Lecithocladium excisum*, *Opecoeloides furcatus*, *Proctotrema bacilliovatum* and *Holorchis legendrei* parasites of *Mullus surmuletus*. This parasitological investigation was carried out between December 2005 and April 2007 on red mullet from Oran, Annaba and National Park of El Kala coastal waters. (Amel *et al.*, 2009)

Opecoelidae. Body of adult slightly more than quarter of length, flattened sub cylindrical, more tapered anteriorly than posteriorly, with posterior margin having cleft. Oral sucker approximately at or near level of anterior third of body, larger than oral sucker. Pharynx sub globular to globular, smaller than oral sucker. Esophagus present. Intestinal bifurcation approximately at mid-forebody. Caeca ending. Testes 2, Ovary lobed (3-9 lobes), Antero-dextral to anterior testes. Excretory pore at base of posterior cleft. (Andres *et al.*, 2014)

A total of 50 red mullets (50.0%) was found to be infected by at least one of the six Helminthes species identified: three trematodes, namely *Opecoelodes furcatus* (19.0%), *Aponorus loguncula* (1.0%) and *Proctoeces maculatus* (1.0%). (Study of helminth parasites in the red mullet, *Mullus barbatus*, from the Mediterranean Sea and acquired in greater Valencia, Spain) (Debenedetti *et al.*, 2013)

Trematoda digenea have been studied in (61) specimens of striped red mullet, *Mullus surmuletus*, fishes in Gulf of Cagliari, southern waters. Seventeen (27.9%) out of the examined mullets appeared

infected, the record of different species of Hemiuridae was the most frequent (11.5%), followed by those of *Opecoeloides furcatus* (Trematodi digenei di *Mullus surmuletus*)

The trematode *Opecoeloides furcatus*, with a prevalence close to 50%, was the second species in mean intensity, the prevalence and abundances of *O. furcatus* and *Capillary sp.* were significances higher in Barcelona than in Blanes. (Marta *etal.*,2011).

The cosmopolitan digenean family Opecoelidae comprises several hundred species, whose adults live in the digestive tract of marine and freshwater fishes, the genus *Opecoeloides* is represented in the Mediterranean by a single species, *Opecoelodes furcatus*. (Jousson and Bartoli 2000)

The infection by *Opecoeloides furcatus* and *Poracanthium furcatum* (Opecoeliidae) was studied in 121 *Mullus barbatus* and 113 *Mullus surmuletus* collected from the Spanish south-eastern Mediterranean, the prevalence of infection was most frequent in *M. surmuletus* with values of 81.42% for *O. furcatus* and 38.05% for *P. furcatum* in *M. barbatus* the prevalences of *O. furcatus* and *P. furcatum* were 54.54% and 14.88% respectively.

(The occurrence of two opecoeliid digeneans in *Mullus barbatus* and *M. surmuletus*). (A Martinez *etal.*, 2000).



## References

A Martinez-Vicaria, J Martin-Sanchez, P illescas. AM Lara. M Jimenez-Albarran A. (2000). The occurrence of two *opecoeliid digeneans* in *Mullus barbatus* and *M surmuletus*. *Journal of helminthology*, 74(2): 161-164. Google scholar

Brahim Tazi Nawel Amel. Meddour Abderrafik. Bayssade-Dufour Christiane. Boutiba Zitouni. (2009). Investigation Sur Les Parasites Digena de *Mullus surmuletus* Linne, 1758 Dans LE Littoral Algerien. *European. Journal of Scientific Research*, 25(3), 448-462.<http://www.eurojournals.com/Lejsr.htm>. ISSN1450-216X

Debenedettial., Madriod E. and Fuentes M.V. (2013). Study of helminth parasites in the-red mullet, *Mullus barbatus*, from the Mediterranean Sea and acquired in greater Valencia, Spain. *Rev. Ibero-Latinoam.Parasitol*, 72(2), 118-123

Iain Barber, Danie Hoare, Jens Krause. (2000). Effects of parasites on fish behavior: a review and evolutionary perspective. *Reviews in Fish Biology and Fisheries* 10(2), 131-165. Google scholar

Marta Carreras-Aubets, Francisco- Esteban Montero, Francesc Padros, Silvia Crespo and Maite Carrasson. (2011). Parasites and histopathology of *Mullus barbatus* and *Citharus linguatula* (Pisces) from two sites in the NW Mediterranean with different degrees of pollution. *Scientia Marina*, 75(2).369-378. doi:10.3989/ scimar.2011.75n2369

Michael J. Andres, Eric E. Pulis and Robin M. Overstreet. (2014). (New genus of opecoelid trematode from *Pristipomoides aquilonar* (Perciformes:Lutjanidae) and its phylogenetic affinity within the family Opecoelidae. *Folia Parasitologica*, 61 (3), 223-230. <https://doi.org/10.14411/fp.2014.033>

Olivier Jousson, Pierre Bartoli. (2000). The life cycle of *Opcoeloides columbellae* Pagenstecher, 1863) n. comb. (Digenea, Opcoelidae): evidence from molecules and morphology. *International Journal for Parasitology*, 30(6). 747-760. google scholar

Iain Barber, Danie Hoare, Jens Krause. (2000). Effects of parasites on fish behavior: a review and evolutionary perspective. *Reviews in Fish Biology and Fisheries* 10(2), 131-165. Google scholar

Paraguassu A., Luque J., & Alves D. (2002). Community ecology of metazoan parasites of red porgy, *Pagrus pagrus* (L., 1758) (Osteichthyes. Sparidae), from the coastal zone, state of Rio de Janeiro, Brazil. *Maringa Journal*, 24 (2), 461-467. 61\_LIVRO <ufrj.br

-12Rewaid Abdel - Gaber and Hewaydah E. Abou Shafeey., (2020). Light and scanning electron microscopic studies of *Echinorhynchus gadi* infecting the European eel *Anguilla Anguilla* in Egypt, *Journal of the Egyptian Society of Parasitology*, v.50, n.1, p.149-152.

Salman, M. H. M. A, (2000). Basics of fish breeding and production, *Dar Alhekma printing and publishing* –AL- Mosul, 392. scholar.google.com

Sven Klimpel, Sonja Kleinertz, Harry Wilhelm Palm. (2008). Distribution of parasites from red mullets (*Mullus surmuletus* L., Mullidae) in the North Sea and the Mediterranean Sea. *Bulletin of Fish Biology* 10(1/2): 25-38. Google scholar