

## NEMATODE AFFECTING MARINE FISH (*TRACHURUS MEDITERRANEUS*) IN LIBYA

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### ABSTRACT

In a parasitological survey of Mediterranean horse-mackerel , *Trachurus mediterraneus* from Tripoli, Libya , four nematode species were found. *Anisakis physeteris* is reported for the first time in *Trachurus mediterraneus*. *Ichthyanisakis monodi*, *Neogoezia magna* and *Hysterothylacium aduncum* were found in the intestine, between two parts of the gonads and in the abdominal cavity of examined fish specimens .

The incidence of infection and mean intensity varied with season, decreasing in winter and autumn, while they increased in spring and summer. Condition factors of infected fish were significantly lower than those of non infected .

### INTRODUCTION

Recently, parasites and diseases of cultured fish in the Mediterranean region have attracted considerable interest due to the increasing importance of aquaculture activities in this part of the world.

Mediterranean horse-mackerel, *Trachurus mediterraneus* is widely distributed in the Bay of Biscay, Portugal, Morocco and Mediterranean sea (Whitehead et al, 1986) Many authors have looked at its general biology ( Bond , 1979), food and reproduction (Whitehead et al ., 1986) and fishery (FAO,1997). However, the investigation of nematode parasites of *Trachurus mediterraneus* needs further studies. Petter and Maillard (1988 a , b ) made a significant contribution to the knowledge of *Trachurus mediterraneus*. They worked out the larvae of *Hysterothylacium fabri* and *Hysterothylacium aduncum* .

This research was conducted to investigate the nematode parasites affecting *Trachurus mediterraneus* in Tripoli , Libya . In addition, the incidence of infection and mean intensity as well as the effect of nematodiasis on the fish health and condition factors of the fish were also studied.

### MATERIAL AND METHODS

A total of 311 Mediterranean horse-mackerel (*Trachurus mediterraneus*) specimens were collected from natural Mediterranean sea resources (Tripoli region), Libya, during the period from 1<sup>st</sup> October, 1997 up to the end of July , 1998 .

The fish specimens under investigation were measured morphometrically (body weight and total length ) and grossly examined for observation of any external pathological signs . Then the fish were dissected and eviscerated for examination of the internal organs, intestine and abdominal cavity.

The number of isolated nematode were counted by naked-eye search, fixed, cleared and mounted using the technique described by Ivaskin and Hromova (1976), then examined microscopically under X10 and X40 objectives and identified according to Yamaguti (1961) and Petter and Maillard (1988 a, b).

Condition factor was calculated according to Hernandez (1983) by using the following equation,  $k=100 (W/L^3)$ . (K is the condition factor, W is the fish body weight in g. and L is the total length in cm.). Statistical analysis of the obtained data were done by using SAS(1987).

## RESULTS

In the present study, four species of parasitic nematode were found naturally infecting the intestine, gonads and abdominal cavity of the investigated marine fish, Mediterranean horse-mackerel (*Trachurus mediterraneus*).

*Anisakis physeteris* larva (Fig. 1). average length  $12.4 \pm 1.4$  mm. Interlabia small, less than half as long as lips. Esophagus muscular, long, followed by glandular ventriculus.

*Ichthyanisakis monodi* larva (Fig. 2,3,4). average length  $11.3 \pm 0.9$  mm. Body cylindrical. Lips well marked off from the body by festoons, interlabia about half as long as lips. Esophagus muscular followed by glandular ventriculus.

While, *Neogoezia magna* larva (Fig. 5,6). average length  $13.1 \pm 1.2$  mm. Cuticle finely cross-striated, lips flattened. Esophagus swollen posteriorly, without posterior appendage. Tail with ventrally curved terminal spike.

*Hysterothylacium aduncum* larva (Fig. 7,8). Average length  $15.6 \pm 1.1$  mm. Interlabia small, esophagus with posterior glandular ventriculus.

It was noticed that the fish specimens naturally infected with these four species of nematodes had suffered from emaciation and starvation. So that in most cases, the intestine was found nearly or completely empty from food as well as from the fecal matter. Moreover, no apparent changes were noticed in the intestine as well as other internal organs of the host fish except the presence of some necrotic foci on the muscular sheath of the intestine in some cases.

The results concerning seasonal incidence of infection and mean intensity of parasitic nematodes among the fish are presented in Table (1), while condition factor of infected and non infected fish in different seasons are presented in Table (2).

## DISCUSSION

Larval stage of *Anisakis physeteris* is reported in this study for the first time in *Trachurus mediterraneus* from Tripoli, Libya, though there have been various reports on the occurrence of this parasites in the Adriatic fishes (Nikolaeva and Najdenova, 1964; Sey, 1970). Also herring fish in British and adjacent water were found to be naturally infected with *Anisakis* species larvae (Davey, 1972). In addition, Smith and Wootten (1978) found this nematode larvae in *Helicolenus dactylopterus* fish from Motenegro area. Hristovski and Jardas (1983) also reported its occurrence in *Serranus hepatus* fish from mid-Dalmatian area between Solta and Ciovo. Adult of this

nematode are likely to be the parasite of some marine mammals (Dolphins) which considered as definitive hosts ( Sey, 1970).

Larval stage of *Ichthyanisakis monodi* was found in the intestine, between two parts of gonads and abdominal cavity of *Trachurus mediterraneus* fish. It was earlier found in the stomach of *Uranoscopus scaber* fish from Coast of Mauritania by Gendre (1928), while *Neogoezia magna* larvae were previously reported by Kreis (1937) in *Salmo fario* fish.

The larvae of *Hysterothylacium aduncum*, which are common and widely distributed in the Mediterranean sea (Sey, 1970), were previously found in *Trachurus mediterraneus* fish by Petter and Maillard (1988, b).

Incidence of infestation and mean intensity with the detected larval nematodes in *Trachurus mediterraneus* fish varied with seasons, decreasing in winter and autumn, increasing in spring and summer (Table 1). It can be explained on the basis that the first intermediate hosts of Heterocheilidae nematodes are small crustaceans as copepods or amphipods (Paperna, 1980), which reproduce in early spring and the succeeding nauplius and copepodid stages feed well through the spring and summer seasons (McConnaughey, 1978) to become excellent food for fishes which act as second intermediate host (Davey, 1972).

The average condition factor of infected fish was significantly ( $p < 0.05$ ) lower than that of non infected fish during spring and summer seasons (Table 2). These results agree with those reported by Paperna (1980) and may be attributed to the higher incidence of infection and mean intensity in summer and spring than that recorded during winter and autumn seasons.

From this work, it can be concluded that *Anisakis physeteris*, *Ichthyanisakis monodi*, *Neogoezia magna* and *Hysterothylacium aduncum* larvae were found naturally infecting the intestine, gonads and abdominal cavity of *Trachurus mediterraneus* fish, from Tripoli, Libya. Spring and summer seem to be the main periods of infection with these larval nematodes in that fish.

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**Table (1) : Seasonal incidence and mean intensity\* of parasitic nematodes among *Trachurus mediterraneus* fish.**

Season	No. of examined fish	Anisakis physeteris		Ichthyanisakis monodi		Neogeozia magna		Hysterothylacium	
		Incidence (%)	Mean Intensity	Incidence (%)	Mean Intensity	Incidence (%)	Mean Intensity	Incidence (%)	Mean Intensity
Winter	70	8.57	9	7.14	5	4.28	7	10.00	8
Spring	82	37.80	21	19.51	15	15.85	19	26.83	25
Summer	76	23.68	16	21.05	12	13.16	20	19.74	18
Autumn	83	9.64	6	7.23	8	4.82	6	8.43	5
Average		19.92	13	13.73	10	9.53	13	16.25	14

\* Mean intensity was calculated as average number of worms per fish.

Table (2) : Condition factor ( $X \pm SE$ ) of infected and non infected *Trachurus mediterraneus* fish in different seasons :

Season	Infested fish	Non infested fish
Winter	$1.06 \pm 0.03^a$	$1.10 \pm 0.06^a$
Spring	$0.82 \pm 0.11^b$	$1.19 \pm 0.08^a$
Summer	$0.86 \pm 0.09^b$	$1.13 \pm 0.12^a$
Autumn	$1.21 \pm 0.07^a$	$1.18 \pm 0.11^a$

NB : Values with the same raw in each class followed by the same letter do not differ significantly at  $p < 0.05$ .

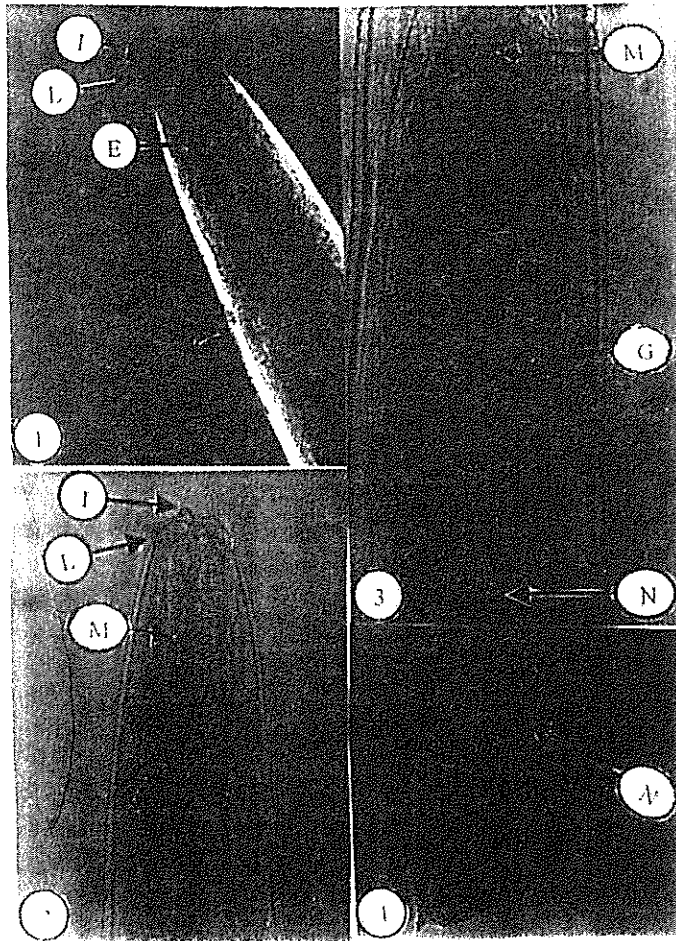


Fig.1-4 : showing Anterior extremity of *Anisakis physeteris* (larva ), interlabia(I), Lips (L), Esophagus (E) (X250).Fig.2:showing Anterior extremity of *Ichthyanisakis monodi* (larva),interlabia (I), Lips (L), muscular esophagus (M) (X250).Fig.3:showing *Ichthyanisakis monodi* (larva), muscular esophagus (M), glandular ventriculus (G), intestine (N) (X400).Fig.4:showing posterior extremity of *Ichthyanisakis monodi* (larva), intestine (N) (X250).

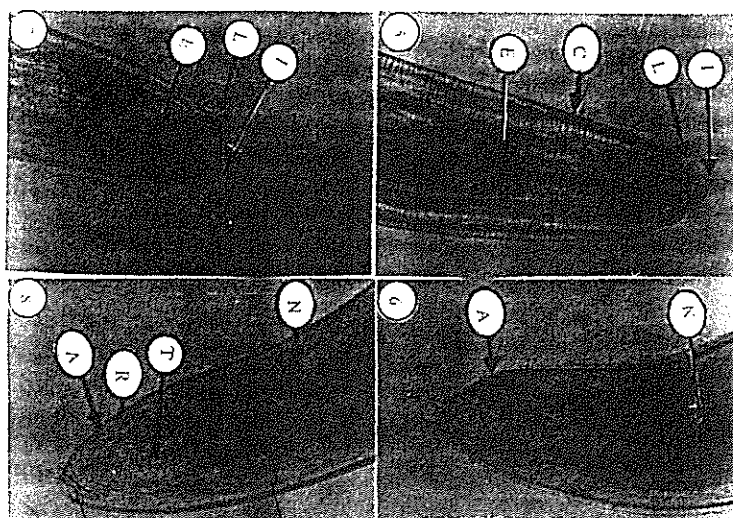


Fig.5-8:showing Anterior extremity of *Neogoezia magna* (larva ), interlabia (I), Lips (L), Esophagus (E) , cuticle ( C ) (X250).Fig.6:showing Posterior extremity of *Neogoezia magna* (larva), intestine (N) , anus (A) (X250).Fig.7:showing Anterior extremity of *Hysterothylacium aduncum* (larva), interlabia (I),Lips(L),esophagus (E) (X250).Fig.8:showing posterior extremity of *Hysterothylacium aduncum* (larva), intestine (N), rectum (R), anus (A), rectal gland (T) (X250) .

### الملخص العربي

الديدان الأسطوانية التي تصيب الأسماك البحرية (ماكريل البحر الأبيض المتوسط) في ليبيا

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أجريت هذه الدراسة للتعرف على الديدان الأسطوانية التي تصيب أسماك ماكريل البحر الأبيض المتوسط و التي تسمى تريكيورس ميديتراينس و المعروفة في الجماهيرية العربية الليبية باسم أسماك الصاورو .

تم تجميع ٣١١ سمكة صاورو من الشواطئ الليبية بمنطقة طرابلس خلال الفترة من أول أكتوبر ١٩٩٧ و حتى نهاية يوليو ١٩٩٨ وفحصت ظاهرياً وأجريت الصفة التشريحية . تم التعرف على الديدان الطفيلية التي تصيبها وتقدير نسبة الإصابة وشدة الإصابة بها وكذلك تأثير الإصابة بالديدان على معامل التناسق للأسماك . وجد أن أسماك الصاورو هي عائل جديد لديدان أينسكس فيسيتيرس بمنطقة طرابلس وأيضا تم التعرف على ديدان إيكثيانيسكس مونودي وديدان نيوجوايزيا ماجنا وديدان هيستيروثيلسليم أدونكم في الأمعاء و التجويف البطني و بين فصين المناسل لهذه الأسماك .

وقد جد أن نسبة الإصابة وشدة الإصابة بهذه الديدان تزداد في أسماك الصاورو في فصلي الربيع والصيف عنها في فصلي الخريف و الشتاء و كذلك تأثر معامل التناسق للأسماك تأثراً معنوياً بالإصابة بالديدان الطفيلية خاصة في فصلي الربيع و الصيف وعدم تأثره في فصلي الخريف و الشتاء .