Studies on Crustacean Diseases of Seabass, *Morone Labrax*, in Suez Canal, Ismailia Governorate

Eissa I A M, Maather El-Lamie & Mona Zakai*

Dept. of Fish Diseases & Management, Fac. of Vet Med., Suez Canal Univ.
* Hydrobiology Dept., National Research Center, Dokki.
Eissavet29@yahoo.com

Abstract: The present study was carried out to detect the parasitic crustaceans affecting marine seabass *Morone labrax* that collected seasonally from different areas of Suez Canal (Ismailia province). There were no pathognomic signs in infested fish. Some revealed signs and P.M. lesions as bulging of opercula, hemorrhages, abrasions and ulcers on skin, sluggish movement and emaciation. The crustacean parasites were identified as copepods of *Lernanthropus psciaenae* and *Caligus carangis.* The total prevalence was (47%) and the summer displayed the highest seasonal prevalence. The relation between fish body weights, lengths and infestation rate were also studied.

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Key words: Seabass, Lernanthropus psciaenae, Caligus carangis, Prevalence

1. Introduction:

Marine fishes are preferable than freshwater fishes as the former are rich in trace elements as phosphorous and iodine, which are essential for cell metabolism. Fishes are generally rich in unsaturated fatty acids which preferred by some diseased people especially with heart and circulatory disorders ***(Hisk, 1987)***.

Parasitic infestations represent the majority of the known infectious diseases affecting fish (***Eissa, 2002; Ragias et al., 2004; Timi and Lanfranchi, 2006; Woo, 2006 and Noga, 2010).*** Most studies of fish parasitic diseases in Egypt have been conducted on freshwater fishes especially in Suez Canal area.

The present study was directed towards further understanding of marine seabass fish in Suez Canal region (Ismailia). The objectives were decided to throw the light on the clinical picture, total & seasonal prevalence of the crustacean parasitic diseases affecting such fish. Besides, the infestation rates in relation to body weights & lengths.

2. Material & Methods

Fish

A total of 100 marine fish *Morone labrax* were collected from Suez Canal area (Ismailia Province). Their body weights and lengths were ranged from less than 50 up to 300 gm and 15 to 35 cm, respectively. The fish were obtained seasonally (each 25 fish) by the aid of fishermen and fishing gears, then transported to the laboratory alive in polyethylene bags containing 1/3 of its volume water where the remaining volume was filled with air.

Aquaria

Fully prepared glass aquaria (100 x 50 X 50 cm) were used for holding fish. They were supplied with sea water from Suez Canal; continuous aeration was maintained in each aquarium using an air pump (Elmassy, Model EM-148). Thermostatic heaters (Type CMI, Germany) were used along the course of the study.

Clinical picture:

First, body weight and body length of the examined fish were recorded and then clinical examination was done on the live fish or freshly dead ones. Fish specimens under investigation were grossly examined for determination of any clinical abnormalities and any external parasite. For demonstration of the internal abnormalities, the postmortem examination was performed on all fish according to ***Amlacker (1970).***

Parasitological examination:

1. Macroscopic examination:

Macroscopic examination was done for detection of any abnormalities in different parts of fish body by nacked eyes and hand lens. Skin, fins, gills, eyes and opercula were dissected and examined for presence of parasitic crustaceans.

2. Microscopic examinations:

Freshly sacrificed fish was scraped with a scalpel blade from just behind the operculum to the tip of the tail fin. Scales and mucus were transferred to slides with a drop of marine water and cover slip to prevent drying and examined microscopically *(Lucky, 1977).*

3- Permanent slides, smear preparations and staining:

The attached crustaceans to the gills, skin and buccal cavity of fish were collected. They could be recovered, detached by a dissecting needle and a fine brush, put in small vial and washed with distilled water, preserved in equal amount of 70% alcohol-5% glycerin in test tube and permanent amounts were prepared by passage in descending grades of alcohol (70, 50 and 30%), cleared in glycerin and mounted in glycerin-gelatin according to *Lucky (1977)* then examined

microscopically. Crustacean parasites were identified according to Badawy (1994).

3. Results

Clinical picture:

The clinical signs in the naturally infested fishes (*Morone labrax*) revealed no pathognomonic clinical abnormalities. Infested fish showed hemorrhagic areas on gill cover, abdomen and on the bases of fins , abrasions and ulcers on the body surface with rubbing the body against objects and sides of aquaria, sluggish movement, abdominal distension and somewhat emaciation. The examination was performed on the freshly dead fish and it revealed a marbling appearance with excessive mucus secretion. Gill tips were sticking with grayish coloration. Black lines and black spots between the gill filaments were seen (Plates, 1-3).

Results of parasitological examination:

A crustacean species was collected from the gills of *M. labrax*. The male body is slender in shape and measuring 1.8 mm. in length and 0.6 mm. in width. The mandible is slender and has 7 denticles. The first maxilla consists of 3 segments; the terminal is conical, and the basal segment has 2 distal broad spines. The terminal segment of second maxilla is provided of 2 rows of blunt teeth and blunt spines on the inner margins. The third segment has a single distal spine. The exopod has 5 short distal spines, while the endopod has slender bristled seta. The caudal rami are short. The female is somewhat cylindrical and measured 3.2 mm and 0.9 mm in width at the middle of the body. The head separated by a constriction from the rest of the body. The first thoracic leg is biramous, the exopod of the first segment bear blunt distal spines, while, the endopod bear an elongated distal spine. A tiny papilla-like process is located at the base of the endopod. The egg strings are elongated and uniseriate, strongly flattened eggs (Plates, 4&5). Based on the morphological characters, such crustaceans are belonged to Lernanthropidae, *Lernanthropus psciaenae* Badawy, 1994.

Another crustacean parasite was collected from the gills, buccal cavity and skin of *M. labrax*. The body length of the female measures 2.6 mm and the greatest width measures 1.02 mm. The cephalothorax is nearly as long as wide. The abdomen has one segment and is nearly 3 times longer than broader. The caudal rami are longer than wide. The second antenna has a recurved claw. Female characterized by long bar-shaped egg pouches or strings (Plate, 6). Based on the morphological characters, these crustaceans are related to Calgidae, *Caligus carangis* Badawy, 1994

Prevalence of crustacean infestation in seabass fish:

Table (1) shows total and seasonal prevalence of crustacean parasites in examined *M. labrax* fish. Tables (2&3) show the prevalence in relation to body weights and lengths.

Table (1): Seasonal prevalence of crustacean infestations among seabass *M. labrax*

Season	No of examined fish	No. of infested fish with Caligus carangis	No. of infested fish with Lernanthropus piscianae	No. (%) of infested fish
Autumn	25	10	7	17 (68)
Winter	25	3	1	4 (16)
Spring	25	5	2	7 (28)
Summer	25	11	8	19 (76)
Total	100	29 (29)	18 (18)	47 (47)

Table (2): Prevalence of the recorded crustacean infestations in relation to length among *M. labrax*

Body length (cm)	No. examined	Crustacean infestation	
		No. infected	%
10-15	20	0	0
15- 20	20	8	40
20- 25	20	10	50
25- 30	20	9	45
30- 35	20	20	100
Total	100	47	47

Table (3): Prevalence of the recorded crustacean infestations in relation to body weight among *M. labrax*

Fish body weight (g)	No. examined	Crustacean infestation	
		No. Infected	%
< 50	21	6	28.57
50- 100	19	9	47.36
100-150	18	13	72.22
150- 200	22	9	40.90
200- 300	20	10	50

Total	100	47	47

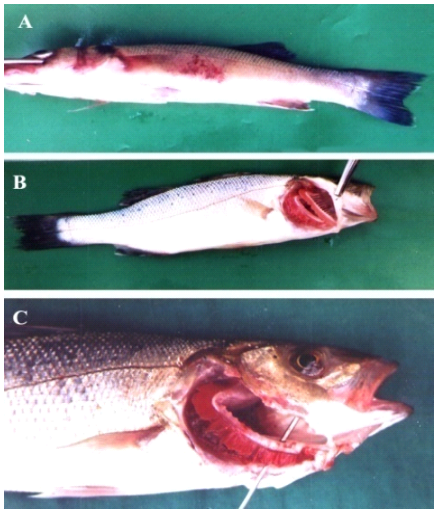

Plate (1): A. Haemorrhages allover the body surface and at the bases of fins of Morone labrax, B. & C. Showing gills of Morone labrax with sticking of the gills.

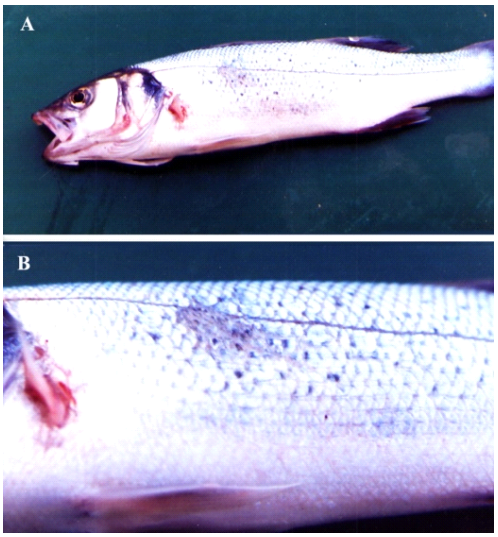

Plate (2): A. & B. Abrasions and ulcers on the body surface of *Morone labrax*.

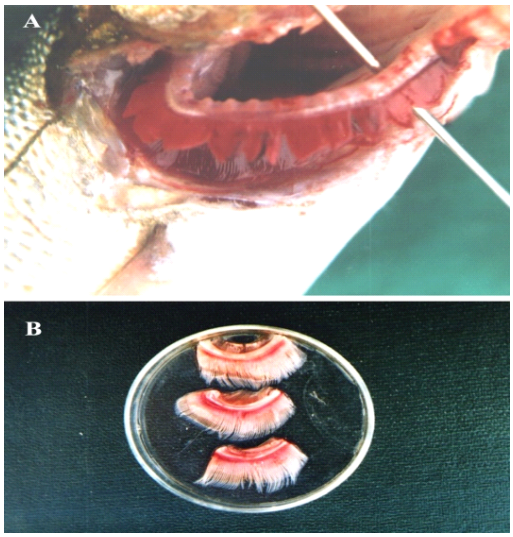

Plate (3): A. & B. Gills of *Morone labrax* with mosaic appearance, sticking of the gills and grayish coloration.

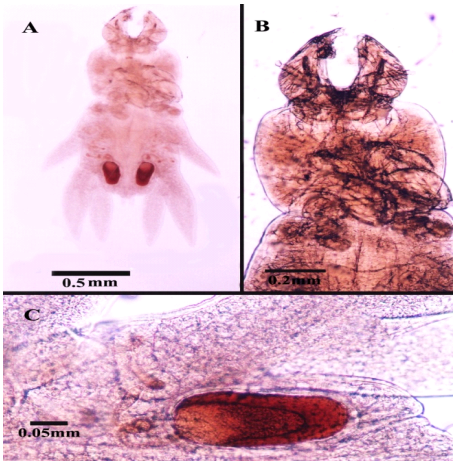

Plate (4): Light photomicrograph of male *Lernanthropus pscianae* A. Whole copepode, B. Anterior end showing

Plate (5): Light photomicrograph of female *Lernanthropus pscianae*: A. female attacking gills of *Morone labrax* forming black lines between gill filaments, B. Whole copepode

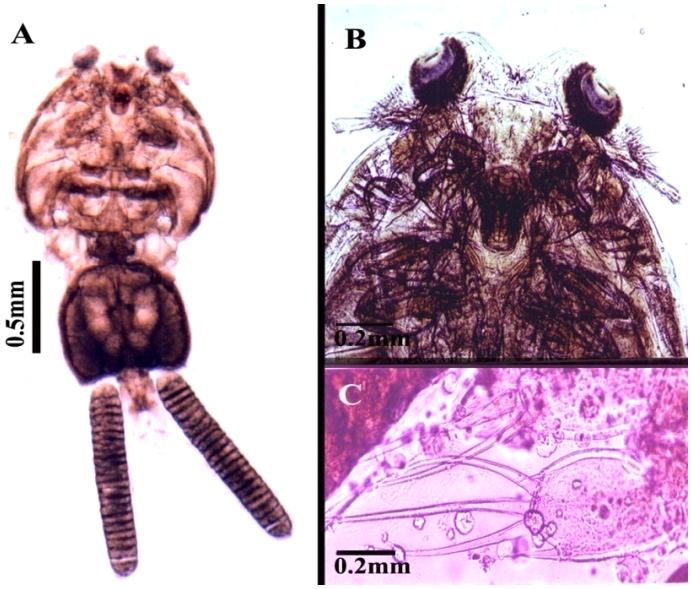

Plate (6): Light photomicrograph of female *Caligus carangis*: **A.** (Whole copepod), **B.** Anterior end showing two eyes, first & second maxilla and Claws, **C.** Caudal ramai.

4. Discussion:

The main clinical signs observed in infested *M. labrax* with crustacean infestations were excessive mucus production, sluggishness and rubbing the body against hard objects and sides of aquaria to get rid the irritation induced by the parasites. Opercula were bulging. Fish gathered at water surface (surface breathing) with gulping the atmospheric air. These results are in agreement with those reported by ***Andrews et al. (1988) Poynton et al. (1997)***, ***Ragias et al. (2004) and Osman (2005).*** Any slight structural damage of gills can render a fish very vulnerable to osmoregulation as well as respiratory difficulties as fish gills are responsible for regulating the exchange of salt and water and play a major role in excretion of nitrogenous waste products. These results may be attributed to the low respired oxygen of destructed gill epithelium which caused by feeding activity, attachment, fixation and locomotion of crustaceans

causing massive destruction of respiratory epithelial cells ***(Eissa, 2002).***

This study showed that skin, gill cover and bases of fins appeared with hemorrhagic areas, abrasions and ulceration on the body surface, these signs agreed with those obtained by ***Ragias et al. (2004)*** and may attributed to irritation caused by *Caligus carnages*, they often remains attached when host is removed from the water. In which the female isolated from skin and external surface ***(Kabata, 1988***; ***Santos, 1996; Karlsbakk et al., 2001 and Noga, 2010).*** Sea lice feed on surface tissues of their hosts, which can lead to many problems especially for small juvenile fish ***(Price et al., 2011)***. Sea lice at the peak of infection were associated with the severity of eye damage; this may be because lice graze on the cornea or because tuna injure their eyes when flashing rubbing ***(Hayward et al., 2008)***.

Emaciation was recorded in *M. labrax* may be due to crustacean infestation which reduce fish appetite and became off food, this agreed with ***Tavares and Luque (2001) and Nagasawa (2004).*** Crustaceans reduce growth rates and, in sufficient numbers, result in host death ***(Morton et al., 2005; Krkosek et al., 2006 and Costello, 2009).***

Regarding the postmortem examination, it was revealed areas of congestion and paler (Marbling) of gills with excessive mucus secretions and sticking of the gill tips and grayish discoloration. This result agreed with ***Andrews et al. (1988), Nahla (1993) and Osman (2005).*** Lernanthropus is known to cause some pathological effects on its host. It attaches to the gill filaments using antennae and third legs leading to pathological effects such as erosion, desquamation, necrosis in branchial epithelial tissue, increase of mucus secretion, narrowing in capillary veins have been reported **(*Manera and Dezfuli, 2003 and Tosken et al., 2008)***. These lesions may be attributed to the severe irritation caused by movement, feeding activity and fixation of such crustaceans which result in asphyxia and then death. Also, it may be due to the hard fixation of crustacean parasites with their claws activity. The excessive mucus secretion, may be to dilute the irritation and act as a defense mechanism against the infestation.

The parasite under discussion isolated from gills of *M. labrax*. This agree with ***Akmrza (2003); Tosken et al. (2008) and Henery et al., (2009)*** who isolated the same genus from the same host and site. ***Badawy (1994)*** who obtained the same species from gills of *Sciana umbra* and disagree with ***Roubal (1986), Luque et al. (1989)*** who obtained the same genus from *Acanthopagrus australis* and *Paralonchuri peruanus*, *Seriolella violacea* and *Anisotremus scapularis*, respectively. The site of infestation was in accordance to that mentioned by ***Kensely and Grundley (1973); Badawy (1994).*** However the host and locality varied from those mentioned before. The parasite measurements and morphological characters are nearly similar to that obtained by ***Badawy (1994)*** so it was identified as *Lernanthropus psciaenae*, Badawy, 1994.

The second parasite under discussion isolated from gills, oral cavity and skin and this is agreed with ***Kabata (1988)*** who isolated it from skin and with ***Oldwage (1990)*** who collected female parasite from the buccal cavity of *Arthron hipidus* and ***Cressy (1991)*** and ***Badawy (1994)*** who isolated it from gills of *Caranx sem and* ***Maran et al. (2009)*** *who isolated the same genus from gill cavities and body surface of marine fish*. Comparing the present data with the other previous data, it is clear that the parasite has all morphological characters and measurements of *Caligus carnages*, Badawy,1994.

Regarding Crustacean infestation (Copepodiasis), the total prevalence was 47% . This result is higher than that obtained by ***Abd El-Aal (2003)*** as it was (10.43%) while it is much higher than that obtained by ***Badawy (2001)*** as the rate was (2.25%). This difference may be attributed to the locality from which fish samples obtained and the difference in fish species. Also, the prevalence was disagree with that obtained by ***Badawy (2001)*** who found no infestation in *M. labrax* but with a rate of (0.61%) in *Siganus canaliculatus*, ***Abd El-Aal (2003)*** who detected *Caligus elongates* (8.75%) in *S. commerson*, ***Manera and Dezfuli (2003)*** with *Lernanthropus kroyeri* (35%) among *Dicentrarchus labrax* and ***Vagianou et al. (2004)*** with copepode infestation rate (13.6%).

Regarding the seasonal prevalence of crustacean infestation, the peak was highest in summer 76%, followed by autumn 68% then Spring 28% and Winter 16%. This agrees with results obtained by ***Badawy (1994)*** in which he recorded the summer season as the season of the highest infestation rate and the lowest was the winter season. Increasing mean sea temperatures are likely to increase infestation pressure with sea lice on farms and wild fish as well as affecting the geographical distribution of hosts and parasites.

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