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

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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 pscaenae 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.


Key words: Seabass, Lernanthropus pscaenae, 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 naked 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.
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 pisciaeae* 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 Caligidae, *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*

<table>
<thead>
<tr>
<th>Season</th>
<th>No. of examined fish</th>
<th>No. of infested fish with Caligus carangis</th>
<th>No. of infested fish with Lernanthropus pisciaeae</th>
<th>No. (%) of infested fish</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autumn</td>
<td>25</td>
<td>10</td>
<td>7</td>
<td>17 (68)</td>
</tr>
<tr>
<td>Winter</td>
<td>25</td>
<td>3</td>
<td>1</td>
<td>4 (16)</td>
</tr>
<tr>
<td>Spring</td>
<td>25</td>
<td>5</td>
<td>2</td>
<td>7 (28)</td>
</tr>
<tr>
<td>Summer</td>
<td>25</td>
<td>11</td>
<td>8</td>
<td>19 (76)</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>29 (29)</td>
<td>18 (18)</td>
<td>47 (47)</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Body length (cm)</th>
<th>No. examined</th>
<th>Crustacean infestation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. infected</td>
</tr>
<tr>
<td>10-15</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>15-20</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>20-25</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>25-30</td>
<td>20</td>
<td>9</td>
</tr>
<tr>
<td>30-35</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>47</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Fish body weight (g)</th>
<th>No. examined</th>
<th>Crustacean infestation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>No. Infected</td>
</tr>
<tr>
<td>&lt; 50</td>
<td>21</td>
<td>6</td>
</tr>
<tr>
<td>50-100</td>
<td>19</td>
<td>9</td>
</tr>
<tr>
<td>100-150</td>
<td>18</td>
<td>13</td>
</tr>
<tr>
<td>150-200</td>
<td>22</td>
<td>9</td>
</tr>
<tr>
<td>200-300</td>
<td>20</td>
<td>10</td>
</tr>
</tbody>
</table>
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.
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 Ragius 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 Lernanthropus is known to cause Osman (2005).

Infestation was in accordance to that mentioned by Krkosek et al., 2006 and Costello, 2009). 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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