

## Isolate two Crustaceans which infect *Cyprinus carpio* L. from Bab Al-Muatham fish markets, Baghdad City

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### Abstracts

During the period from November 2007 till October 2008, a total of 255 specimens of the cyprinid fish, from freshwater fish *Cyprinus carpio* Linnaeus, 1758, were collected from fish markets east of Baghdad city. Microscopic examination of these fishes revealed that they were infected with two species of the crustaceans [*Argulus foliaceus* (0.8%) and *Ergasilus sieboldi* (20%)]. The present study included the following: The clinical signs which were caused by the crustaceans, which included redness and an opacity of the skin, increase of mucus secretion and rapid movements of the operculum. The percentage incidence of the infection with these parasites were also found to be related to different length groups of the host, the larger fishes were more infected (95.2%) while the smaller fishes were less infected (0.8%).

**Key words:** crustaceans, cyprinus carpio L. fish.

عزل نوعين من القشريات التي تصيب سمكة الكارب الاعتيادي *Cyprinus carpio* L. من أسواق باب المعظم ، مدينة بغداد .

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### الخلاصة

أثناء المدة المحصورة بين تشرين الثاني 2007 وتشرين الأول 2008 جمعت وفحصت 255 سمكة تعود إلى عائلة الشبوطيات، من أسماك المياه العذبة وهي سمكة الكارب الاعتيادي *Cyprinus carpio*، جمعت الأسماك من أسواق بيع الأسماك شرق مدينة بغداد. أظهر الفحص المجهرى للأسماك أنها مصابة بنوعين من القشريات [*Argulus foliaceus* (0.8%)، *Ergasilus sieboldi* (20%)]. تضمنت الدراسة الحالية الجوانب الآتية : دراسة العلامات السريرية التي تسببها القشريات والتي تمثلت باحمرار وعتامة الجلد وزيادة إفراز المخاط وسرعة الحركات التنفسية. هناك علاقة بين النسب المئوية للإصابة مع مجاميع الطول المختلفة، فمجاميع الأسماك الكبيرة أكثر إصابة (95.2%) من مجاميع الأسماك صغيرة الطول (0,8%).

### Introduction

Fish culture is an old branch of animal's husbandry (1). Fishes are considered as a resource of protein, fat, phosphate, Iron, calcium, amino acids and vitamins which are soluble in water and other vitamins which are soluble in fat (2). Common carp *Cyprinus carpio* L.

was introduced for the first time to Iraqi water in 1954 (3) in Al-Zaafaraniya fish farm. All living beings can be in certain circumstances subjected to diseases, and fishes make no exception (4). These diseases are divided into two types: infectious and non-infectious diseases (5). Non infectious diseases are caused by abiotic factors. These diseases are called environmental diseases. Infectious diseases are caused by biotic factors such as bacteria, fungi, viruses and parasites. Parasites cause a decrease in fish resistance to other diseases and can be exposed to secondary infections like bacterial and fungal diseases (6; 7). Crustacean parasites, which may become problematic under intensive aquaculture conditions such as overcrowded conditions, may become particularly lethal to juvenile fishes (5).

### **Materials and Methods**

A total of 255 fishes were collected from Bab Al-Muatham fish markets, east of Baghdad city, during the period from November 2007 till October 2008. Five to seven fishes were collected weekly. These samples were transferred alive or freshly dead to the research laboratory by plastic containers. Fishes were examined as soon as possible after killing them by pithing method. Total and standard length were taken and fishes were weighted by balance type Mettler PE 3600gm. The range and (mean) of total length was 16-41(27.5cm). The range and (mean) of weight was 62-1300 (342.8gm). The external surface of the fishes: fins, skin and gills were examined under a magnifying lens (x10), then scrapping of the skin was done by spatula to collect the mucus in Petri dish with normal saline (0.9%) for microscopic examination. Next, the gills were removed from the branchial cavity and placed in Petri dish for microscopic examination under the compound microscope type Novex (Holland), under a power of 100-400 times. The parasites were identified according to the following references of 8, 9, 10 and 11. The parasites were photographed by Olympus microphotographic system with a camera. After diagnosing of the parasites, they were fixed by 10% formalin and staining by aceto-carmine. This stain preparation was carried on according to (12 and 13) as in the following form:

Carmine	0.5gm
45% glacial acetic acid	45 gm
Distilled water	50ml

The prevalence of infection was calculated as demonstrated by (14).

$$\text{Prevalence (\%)} = \frac{\text{Number of infested fishes}}{\text{Total number of fishes examined}} \times 100$$

Statistical Analysis Chi square test was applied to determine the significancy in the percentage incidence of infection of parasite species with different fish length groups.

### **Results**

The result of the external examination of these fishes demonstrated that 53 fishes (out of 255 examined fishes) were infected with two crustacean parasites (*Argulus foliaceus* (0.8%) and *Ergasilus sieboldi* (20%) figure (1) as shown in table (1). So, the overall prevalence of infection was 20.7% as shown in table (2). The skin of infected fishes showed hemorrhagic foci with increase of mucous secretion. In some areas, presence of bluish-white areas on the skin was noticed. Also, redness a round areas on the base of fins were noticed. Gills of infected fishes presented hyperemic areas with increase in mucous secretion. Table (2) shows percentage incidence of different length groups of *C. carpio* with these two species of crustaceans. Chi-square test shows significant differences in the infection with these parasites. Statistical analysis (Chi-square test) demonstrated significant differences between percentage incidence of infection and different length groups of *C. carpio*. The maximum percentage incidence of parasites (95.2%) was recorded from larger length group (>35cm) in comparison with the two other groups.

Phylum Arthropoda

Class Crustacea

Order Copepoda

Family Ergasilidae

Genus *Ergasilus*

Species *Ergasilus sieboldi* Nordmann, 1832

Order Branchiura

Family Argulidae

Genus *Argulus*

Species *Argulus foliaceus* (L., 1758)

**Table (1): Diagram showing classification of the parasites of *C. carpio* of the present study.**

**A – *Argulus foliaceus***

Fish length groups (cm)	Number of fish examined	Number of fish infected	Percentage incidence (%)
16-25	124	0	0
26-35	110	0	0
> 35	21	2	9.5
Total	255	2	0.8

Calculated  $\chi^2 = 13.5$

Tabulated  $\chi^2 = 5.99$

$P \leq 0.01$

**Table (2): Percentage incidence of different length groups of *C. carpio* with two species of crustaceans.**

**B – *Ergasilus sieboldi***

Fish length groups (cm)	Number of fish examined	Number of fish infected	Percentage incidence (%)
16-25	124	1	0.8
26-35	110	30	27.3
> 35	21	20	95.2
Total	255	51	20

Calculated  $\chi^2 = 44.93$

Tabulated  $\chi^2 = 5.99$

$P \leq 0.01$



**Figure (1): *Ergasilus sieboldi* in the gills of *C. carpio* (x100).**

### **Discussion**

The results of the present study demonstrated that the common carps were infected with two species of crustasean parasites:

#### *Argulus foliaceus*

This parasite was recorded for the first time in Iraq from skin of *B. luteus* and *C. carpio* from different localities of Iraq (15). Afterwards, it was recorded from ten other species of freshwater fishes (16) like *C. carpio* in some fish farms like Al-Zaafaraniya fish farm (17), Al-Furat fish farm (18) as well as from fish farms in north of Baghdad city (19), fish farms in Neinava province (20) and Ainkawa fish hatchery in Erbil city (21). Also, it was recorded from natural waters like Al-Qadisiya dam lake (22) and Tigris river at Salah Al-Deen province (23).

#### *Ergasilus sieboldi*

This parasite was recorded for the first time in Iraq from gills of *Aspius vorax* from different fish markets in Iraq (15). Afterwards, it was recorded from 16 species of freshwater fishes like *C. carpio* from Al-Latifiya and Al-Suwairai fish farms (24), Al-Furat fish farm (18; 25), Al-Amiriya fish farm (26) and Al-Zaafaraniya fish farm (27). Also, it was recorded from natural waters like Al-Qadisiya dam lake (22) and Al-Husainia creek in Karbala province (28).

The crustaseans of fishes cause clinical signs that observed on the infected fishes, fishes become dull and feeble, rest frequently near the surface of the water, while every movement becomes more difficult and the animals die from complete exhaustion (1). The fins are held close to the body. Skin becomes slimy than normal with the appearance of small blood spots. The gills are expanded and become very pale. These signs agree with those of (4, 5 and 7). These clinical signs appear due to necrosis that occurs in the places of parasite attachment, increase secretion of the mucus in the site of infection and deformation of the epithelial cells of gill lamellae (1 and 5). The fluctuation of prevalence of parasites in different length groups of *C. carpio* of the present study demonstrated that the highest prevalence of parasites (95.2%) was recorded from fish samples belonging to the larger length group (>35cm) and the lowest (0.8%) was recorded from fish samples belonging to the smaller length group (16-25cm). So, higher infection was recorded from fishes of the larger length group more than the smaller and medium length groups, due to the increase of the surface area of the infected fishes exposed to parasites. The present finding agrees with those of (18, 26 and 28).

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