

**INVERTEBRATES  
MANAGEMENT AND  
FISHERIES**

**THE USE OF LIVE FOOD IN REARING OF THE LARVAE OF GRASS CARP  
*Ctenopharyngodon idella* (Valenciennes in Cuvier and Valenciennes, 1844)**

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**ABSTRACT**

The larvae of the grass carp *Ctenopharyngodon idella* were fed on three types of live food: *Brachionus calyciflorus* Pallas, *Artemia* sp. Leach and *Daphnia magna* Strauss. The present study showed that live food is very important to achieve high growth and survival rate of fish larvae. The average weights of *C. idella* fed on *B. calyciflorus* were 118.12 mg/larva and 29.48 mm/larva respectively, With *Artemia* sp., the rates were 103.13 mg/larva and 25.34 mm/ larva, while for the mixed food treatment the rates were 122.80 mg/ larva and 30.08 mm/larva. The survival rate was better for larvae fed on *B. calyciflorus* (98.6%), while it was 98% and 97% in case of mixed food and *Artemia* sp., respectively.

## SPECIES COMPOSITION, ECOLOGICAL INDICES AND TROPHIC NATURE OF FISH ASSEMBLAGES IN AL-HUWAYZA MARSH, SOUTHERN IRAQ

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### ABSTRACT

Monthly fish samples were collected from the restored Al- Huwayza marsh during the period from October 2005 to September 2006. Two stations were sampled; Um Al-Naaj and Taraba. Fifteen species were captured; all of them were freshwater species. Native species were represented by 12 species, alien species by 3 species, residents by 9 species, seasonal by 3 species, and occasional by 3 species. *Liza abu* (Heckel) was the most dominant species, followed by *Barbus luteus* (Heckel), then by *Carassius carassius* (L.). Diversity ranged from 0.88 in December to 2.01 in June, while richness ranged from 0.73 in December to 2.42 in June. Evenness ranged from 0.49 in January to 0.85 in June. Water temperature exhibited a medium correlation coefficient with the number of species and a weak correlation with total catch. However, a strong negative correlation was obtained between salinity and number of species and a weak negative one with total catch. Strong correlation coefficients were found between total catch and both detritivores and herbivores, while a medium correlation was obtained with carnivores and a weak one with predators. The trophic pyramid was formed of herbivores (*Barbus sharpeyi* Günther, *B. luteus* and *C. carassius*), detritivores (*L. abu*), omnivores (*Cyprinus carpio* L.), and carnivores (*Acanthobrama marmid* Heckel, *Alburnus mossulensis* (Heckel), *Heteropneustes fossilis* (Bloch), and *Mastacembelus mastacembelus* (Banks and Solander)). Two predators existed in Al-Huwayza Marsh; *Silurus triostegus* Heckel and *Aspius vorax* Heckel.

**IMPACTS OF SALINITY AND NUTRIENT ON SURVIVAL OF LARVAE OF SHRIMPS (*Macrobrachium nipponense* (De Haan, 1849))**

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**ABSTRACT**

Impacts of salinity and nutrient on the survival of larvae of shrimps (*Macrobrachium nipponense*) were studied. Larvae were cultured under laboratory conditions since their release from their adults brought from the Shatt Al–Arab River at the Garmat Ali region. Larvae at early development stages were subjected to ascending concentrations of salinity (5, 10, 15, 20, and 25‰) to determine the differences in survival ratio. High survival rates were found in 5, 10, and 15‰. No salinity influence occurred on development and nutrient at salinity concentration higher than 15‰. The results showed that tolerance of larvae of this species was greater in earlier stages than those in advanced stages. It was found that larvae preferred feeding on newly hatched *Artemia* sp. Leach, as a result of highest survival rates obtained at 15‰.

**A NEW SPECIES OF *Phyllodiptomus* Kiefer, 1936 (COPEPODA, CALANOIDA)  
FROM THE SHATT AL-ARAB RIVER, SOUTHERN IRAQ**

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**ABSTRACT**

A surface plankton sample was collected from the Shatt Al-Arab River opposite to Al-Faw, southern Iraq, on 28 April 2005, as a part of the monthly plankton-monitoring project on the Shatt Al-Arab River and its branches. A rather distinct species of diaptomid copepod was recognized; it seems to belong to the genus *Phyllodiptomus* Kiefer, 1936. In this collection the males outnumbered the females. A critical examination of both sexes of this species indicates that, in spite of some close similarities to *Diaptomus blanci* (Guerne and Richard, 1889) = (*Phyllodiptomus blanci* after Kiefer, 1978), they possess certain unique morphological features justifying the description of a new species, which is named here as *Phyllodiptomus irakiensis*.

**ACTIVITY TREATMENT OF SUMICIDIN AGAINST THE PARASITIC COPEPODS *Lernaea cyprinacea* (L.) INFECTED EGGS AND JUVENILES OF COMMON CARP *Cyprinus carpio* L. AND MOSQUITO FISH *Gambusia affinis* (Baird and Girard) AND THE HISTOPATHOLOGY ALTERATIONS**

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**ABSTRACT**

The activity treatment of Sumicidin, which is used as a pesticide to control the parasitic copepod *Lernaea cyprinacea* (L.) and its life stages and the parasitic protozoa *Tetrahymena corlissi* Thompson, was measured. Serial contestation was done (0.001, 0.005, 0.001, 0.1, 0.5, 1.0 ml/liter) for 6, 12, 24, 48, and 72 hours to examine the pathological effects on the blood, liver and mussels of juvenile carp and *Gambusia affinis* (Baird and Girard) mosquito fish. The results of this study show the 0.01 ml/liter concentration highly affected the activity of the larval stage and protozoan parasite after 72 hours. The 0.1, 0.5 and 1.0 ml/liter concentrations strongly affected both fish survival and the larval stage of the parasites, and also affected the liver tissue and the blood.

**ECOLOGICAL ASSESSMENT OF THE FISH ASSEMBLAGE IN SHATT AL-ARAB RIVER / GARMAT ALI, BASRAH USING INTEGRATED BIOLOGICAL INDEX (IBI)**

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**ABSTRACT**

The fish assemblage of Shatt Al-Arab River/Garmat Ali was biologically assessed through the period August 2003–July 2004 using the Integrated Biological Index (IBI). Thirteen metrics were chosen to calculate the IBI depending on the following major categories (species richness, fish species composition and trophic guilds). The first category is represented by the total number of native and alien species. Fourteen species was obtained for each metric. The second major category includes six metrics. The first is represented by the percentage of *Liza abu* (Heckel) individuals, which accounted for 58.8% of the total catch. The second metric represents the percentage of individuals of alien species. The total number of individuals of alien species was 14,943 (39.63% of the total number). The percent of individuals that are considered as sensitive native species was the third metric, which was represented by 1.62% of the total number of individuals of native species and 0.98% of the total catch. The fourth metric is the tolerant species including 37,327 individuals that accounted for 99% of the total catch. The fifth metric was the percent of individuals of *Carassius carassius* (L.), which contributed by 4417 individuals comprising 11.72% of the total catch. Finally the sixth metric includes the number of common native species for which *L. abu* was the dominant comprising 97.4% of the total number of native fish individuals. The third major category includes trophic guild metrics, which are composed of the percentage of individuals that are considered as omnivores, carnivores, detritivores, herbivores and the native top predators, which constituted 31.4, 0.88, 67.52, 0.2 and 0.3% of the total catch respectively. The IBI values of Shatt Al-Arab River/Garmat Ali were evaluated to be impaired ( $< 60$ ) throughout the year. The maximum value of this index was recorded in April (56.56%) and the lowest was recorded during August (21.42%). There were no significant differences ( $P > 0.05$ ) among monthly IBI values.

## **DISTRIBUTION AND ABUNDANCE OF ROTIFERA IN THE SOUTHERN IRAQI MARSHES**

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### **ABSTRACT**

The Rotifera is the most important zooplankton group in the three southern Iraqi marshes. Therefore; it plays an important role in the food chain of these ecosystems. The numerical abundance of rotifers ranged from 1.12 – 26.5, 0.22 – 21.60 and 1.24 – 21.17 ind./l. in Al-Hammar, Al-Hawaizah and Al-Chebaysah marshes, respectively. Three peaks of abundance were noticed in the three marshes: in Dec. 2005, March/April 2006 and August 2006.

## **DISTRIBUTION AND ABUNDANCE OF CLADOCERA IN THE SOUTHERN IRAQI MARSHES**

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### **ABSTRACT**

The Cladocera play an important role in the ecosystem in the southern Iraqi marshes as they are a major constituent of the zooplankton in the region. They ranged in number from one to 14,762 ind./m<sup>3</sup>. Al-Hammar marshes exhibited the highest number of Cladocera followed by Al-Chebaysch and then Al-Hawaizah marshes. Peak of abundance in Al-Hammar marsh occurred in March, May, August and October 2006. Whereas, in the other two marshes there was only one peak of abundance that occurred in February/March 2006 in both marshes. The exception to this was the highest peak of August 2006 at the Um el-Warid open-water station, which was caused by *Moina* sp. Baird.