

## Description and Factors Affecting Activities of *Gammarus* sp., a Crustacean Predator of *Culex pipiens* Mosquito Larvae in Egypt

Shahira M. O. El Bishlawy; A. F. A. Afify\* and M. M. Shamseldean\*

Dept. of Agricultural Zoology and Nematology, Fac. of Agriculture, Cairo University, Giza, Egypt

\*Applied Center for Entomonematodes (ACE), Dept. of Agricultural Zoology and Nematology, Fac. of Agriculture, Cairo University, Giza, Egypt

(Received: September 2, 2009 and Accepted: September 21, 2009)

### ABSTRACT

A species of a fresh water amphipod, *Gammarus* sp., collected from Wadi El-Rayan, Fayoum governorate, Egypt was described. Predation rate of *Gammarus* sp. on mosquito larvae was calculated. *Gammarus* sp. was found feeding on second instars more than first ones and it didn't feed on 3<sup>rd</sup> or 4<sup>th</sup> instars mosquito larvae. Effect of light and aeration on the survival of *Gammarus* sp. was also tested. Light had no significant effect on the survival of *Gammarus*, while aeration significantly increased its life period under laboratory conditions.

**Key words:** *Gammarus* sp., *Culex pipiens*, Mosquito larvae, Predation, Activities.

### INTRODUCTION

Genus *Gammarus* is represented by more than 200 species worldwide (Vainola *et al.*, 2008). *Gammarus* sp. is widespread throughout a diverse range of fresh water habitats and can be the dominant part of many benthic macroinvertebrate assemblages, in terms of both numbers and/or biomass. In general, *Gammarus* is much more active at night than during the day hours. It crawls and walks using its legs in addition to flexing its whole body. When *Gammarus* swims, it often rolls over on its side or back that gives it the name of side-swimmer.

*Gammarus* sp. exhibited wide variations in physiochemical tolerances, habitat requirements, abilities to invade and susceptibility to replacement (Macneil 1999). The effect of different environmental factors on habitat selection in *Gammarus* sp. is well documented in literature. Henry and Danielopol (1999) proved that *Gammarus roeseli* actively selects habitat based on two important environmental variables; dissolved oxygen concentration and direction of water flow.

All *Gammarus* spp. are omnivores and detritivores. They feed on living plant and animal organisms such as fungus, bacteria and algae. They also feed on decaying matter, or detritus. Although many studies have emphasized fish predation on *Gammarus* spp., they themselves preyed upon juvenile and wounded/trapped fish (Macneil *et al* 1997). Few studies have been carried out on *Gammarus* predation on mosquito larvae. Roberts (1995) examined the predatory potential of *Gammarus duebeni* to investigate its effect as predator of mosquito larvae. Mature gammarids ate 4-8 *Aedes detritus* larvae in 24 hours.

In the current study, the effect of *Gammarus* sp.

as a predator of mosquito larvae and its feeding preference on different larval instars was examined. Also, the effect of aeration and light on its survival under laboratory conditions was tested.

### MATERIALS AND METHODS

#### 1- Collecting and preparing crustacean samples

Water Samples were collected from the pools of Wadi El-Rayan, Fayoum governorate, Egypt. All samples were taken from a spot on the shore that contains aquatic plants all year round. A small bucket tied from the handle with long rope was used to take the samples. All samples were taken after sunset. Water samples were poured into plastic bottles, transported instantly in an ice box to the laboratory and kept in aluminum dishes. Samples were kept at room temperature (27 °C) and 16:8 light and dark cycle. Aquatic plants which were found in the pool were taken in plastic bags and placed with the samples. *Gammarus* individuals were isolated from these plants before starting any experimental work. Larvae of *Culex pipiens* mosquito were provided as food source for the *Gammarus* individuals during experiments.

Some specimens were cleared in Nesbitt's solution and mounted in Hoyer's medium (Krants, 1978). Different stages of *Gammarus* were examined under light microscopy for morphological details. All measurements were taken with a micrometer slide and a lens. Nomenclature for morphological characters follows that of Hou and li (2002).

#### 2- Predation rate of the *Gammarus* sp. on *Culex pipiens* larvae

This experiment consisted of ten replicates and conducted for eight consecutive days. Rounded plastic containers of 10 cm diameter were used as replicates. Each container was provided with five