



Larval development of the freshwater shrimp *Atyaephyra desmarestii* (Millet, 1831) *sensu lato* (Decapoda: Caridea: Atyidae) and morphological maturation from juveniles to adults

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Abstract

A complete serial of larval staging of *Atyaephyra desmarestii* (Millet, 1831) *sensu lato* from Louros River (north-western Greece) was obtained in the laboratory and described in detail. Thirty berried females were collected and transferred to an aquarium containing water and vegetation from the sampling site. The newly hatched larvae were transferred into small sterile aquaria and mass cultured. After each moult, several larvae were photographed and preserved with their exuviae. The reared larvae of *A. desmarestii sensu lato* passed through six zoeal stages and one megalopal stage. At the experimental conditions, the durations of each larval stage were as follows: three days for the 1st larval stage; three to four days for 2nd larval stage; six to eight days for 3rd; seven to nine days for 4th; nine to ten days for 5th, 6th and megalopal stages. All the obtained stages were described in detail. The larval morphological characters of the described material and the larvae specimens collected from natural populations were compared with the literature data on closely related species. Morphological description of the different phases for juveniles, immature, female and male mature individuals of *A. desmarestii sensu lato* are also presented in detail.

Key words: larval development, *Atyaephyra desmarestii*, Decapoda, Louros River, Greece, morphological maturation

Introduction

Atyaephyra desmarestii (Millet 1831) *sensu lato* is a freshwater shrimp, which has a wide distribution in Europe, North Africa, and the Middle East (Anastasiadou et al., 2004 and references herein). Species from different areas of its zoogeographical distribution have been under taxonomical investigation (Kinzelbach and Forest, 1985; Gorgin, 1996; Anastasiadou et al., 2006, 2008; García Muñoz et al., 2009; Anastasiadou and Leonardos 2008, 2010). Along with the comparative morphological or/and molecular taxonomic studies, research is also carried out on the larval staging of the species. Gauthier (1924) was the first who described the complete larval development of the species (as *A. d. desmarestii*) from an Algerian population. Later, Gurney (1942) detected some differences in the larval stages between *A. d. desmarestii* and *A. d. orientalis*. More recently, Salman (1987) has published a detailed larval development of *A. d. mesopotamica*. Since then, no further research was carried out on the species larvae.

The main objective of this study is to provide detailed descriptions of *A. desmarestii sensu lato* larvae from Louros River (NW Greece), along with the evaluation of the available literature on the species. New and detailed information on the morphology of the different phases for juveniles, immature, female and male mature individuals of the species is also provided for the first time.

Method

Thirty ovigerous female specimens of *A. desmarestii sensu lato* were collected in August 2007, by means of a hand net with a frame of 30 cm X 35 cm and a mesh size of 2 mm. Sampling was carried out in Louros River, near Fla-