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Morphology of the first zoeal stage of the partner shrimp *Periclimenes amethysteus* Risso, 1827 (Decapoda: Caridea: Palaemonidae: Pontoniinae) studied with the Scanning EM

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Abstract

The morphology of the first stage zoea of *Periclimenes amethysteus* (Risso, 1827) is described and illustrated for the first time. Larvae were obtained from an ovigerous female, caught in Cross Bay, Rovinj, Croatia. The morphological characters are compared to previous larval descriptions of other known species of the genus *Periclimenes* (Costa, 1844) and a combination of three features is presented, which allows the first stage zoeae of *P. amethysteus* to be distinguished from the other already described species. The descriptions are based on dissected larvae analysed with SEM.

Key words: larval morphology, zoea I, Scanning EM, Crustacea, Decapoda, *Periclimenes*

Introduction

The partner shrimp *Percilimenes amethysteus* (Risso, 1827) is widely found throughout the Western Mediterranean Sea (Grippa & d`Udekem d`Acoz 1996) and is also present in the Adriatic (Holthuis 1961). It is a shallow water species and lives associated with the sea anemones *Anemonia viridis* (Förskal, 1775) and *Aiptasia mutabilis* (Gravenhorst, 1831).

Among the Mediterranean species of *Periclimenes* (Costa, 1844) a complete description of the larval stages is available only for *P. sagittifer* (dos Santos *et al.* 2004). Other studies, e.g. Bourdillon-Casanova (1960), Barnich (1996) or dos Santos (1999), dealing with larvae collected from plankton, only refer to *Periclimenes sp.* or are not detailed enough for accurate analysis. The morphology of the zoeae of *P. amethysteus* has not been described yet, hence the first zoeal stage is studied here, using specimens raised in the laboratory.

In addition to the description of the larvae, findings on larval morphology can help to clarify the systematic position of recent taxa. In the Mediterranean Sea the genus *Periclimenes* is represented by at least 6 species (D`Udekem d`Acoz 1996). Three of them, *P. scriptus* (Risso, 1822), *P. amethysteus* (Risso, 1827) and *P. sagittifer* (Norman, 1861), form the "amethysteus group" (Grippa & d`Udekem d`Acoz 1996). But according to Grippa and d`Udekem d`Acoz (1996), there is also a "sagittifer complex", with *P. sagittifer sagittifer* only occuring in Atlantic waters and *P. sagittifer aegylios* seeming to be restricted to the Mediterranean Sea. For the time being, the two species are considered as subspecies, because the exact systematic relationship is not yet established (Grippa & d`Udekem d`Acoz 1996). The "amethysteus group" is apparently difficult to distinguish with respect to its systematics. In such cases an analysis of the morphology of the respective larvae can sometimes help solve classification problems.

In the present study, the first zoeal stage of *P. amethysteus* is described, illustrated and compared to other larval descriptions of species of the genus *Periclimenes*. The study was done using SEM techniques combined with previous dissection, allowing the description of the morphology and an additional detailed analysis of the gnathal edges of the mandibles.

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