



Larvae of two species of *Trizocheles* (Decapoda: Anomura: Paguroidea: Pylochelidae: Trizochelinae), description of the adult of one, and preliminary implications of development on pylochelid phylogeny

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Abstract

The larvae of two species of the pylochelid genus *Trizocheles* are described from prematurely hatched specimens and compared with earlier described larvae of *Pylocheles* (*Pylocheles*) and *Pomatocheles*. Although all are lecithotrophic and exhibit marked advanced development, differences in the larval morphology among the three genera are profound. Consideration is given to these differences as they relate to development in the entire Paguroidea, and the possible impact they may have on pylochelid phylogeny. As one of the *Trizocheles* species is undescribed, adults as well as larvae are described and illustrated.

Key words: Decapoda, Anomura, Paguroidea, Pylochelidae, Trizochelinae, *Trizocheles*, *Pylocheles*, *Pomatocheles*, new species, advanced and lecithotrophic development, phylogeny

Introduction

As noted by McLaughlin *et al.* (2007), the Paguroidea provide a wide range of evolutionary enigmas. This is especially true for the Pylochelidae. Forest (1987) considered these “symmetrical” hermit crabs a heterogeneous assemblage whose phylogenetically significant characters were difficult to identify. So distinctive were the majority of genera, that only *Pylocheles* A. Milne-Edwards, 1880 and *Cheiroplatea* Miers, 1876 appeared sufficiently closely related to be grouped together in a single subfamily. The other five subfamilies, three monotypic, exhibited a vast array of distinct morphological attributes that Forest (1987) disclosed in his very detailed and thorough study.

Only two reports have been published regarding development in pylochelids: Konishi & Imafuku (2000) for *Pomatocheles jeffreysii* Miers, 1879, and Saito & Konishi (2002) for *Pylocheles* (*Pylocheles*) *mortensenii* (Boas, 1926). The former account was based on a single specimen hatched from an ovigerous female held in an aquarium. Konishi & Imafuku (2000) referred to this larva as a hatchling because although enclosed in the embryonic cuticle of a decapod prezoa, its appendages were indicative of abbreviated development. Saito & Konishi (2002) reported on ten larvae that hatched in the laboratory and were preserved promptly. These larvae were referred to as first stage zoeae, although their development also was described as advanced. The larvae of these two species demonstrated morphological diversity similar to that seen in their respective adults.

Recently, an ovigerous female of *Trizocheles spinosus spinosus* (Henderson, 1888), preserved upon collection, was made available to us, together with two dozen or so of her eggs that hatched at the time of preservation. From these we observed heterochronic development in a series of simultaneously and prematurely