First zoeal stage of ?Cataleptodius parvulus (Fabricius, 1793) and Xanthodius denticulatus (White, 1848) (Decapoda: Brachyura): larval evidences and systematic position

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Abstract

The first zoeal stages of ?Cataleptodius parvulus and Xanthodius denticulatus are described and compared with zoeae of other members of the subfamily Xanthinae. The larvae of ?C.parvulus and X.denticulatus differ mainly in: 1) spinulation of rostral and dorsal spines; 2) type of antenna; 3) setation of the basis of first maxilliped; and 4) type of telson. Features common to both species include a carapace provided with well-developed spines on the dorsal (1), rostral (1), and lateral (2) portions; and the antennal protopod and rostrum similar in length. The morphological differences between the zoea I of X. denticulatus and ?C. parvulus are nevertheless consistent enough to suggest that these species do not belong to the same genus Xanthodius Stimpson, 1859 as previously supposed. Also we presume that ?C. parvulus does not belong to the genus Cataleptodius.

Key words: zoeal morphology, Cataleptodius, Leptodius, Xanthinae

Introduction

The superfamily Xanthoidea MacLeay, 1838 consists of three families: Panopeidae Ortmann, 1893, Pseudorhombilidae Alcock, 1900 and Xanthidae MacLeay, 1838 (Ng et al. 2008). The Xanthidae consists of 13 subfamilies, one of which is Xanthinae MacLeay, 1838. Two species, ?Cataleptodius parvulus (Fabricius, 1793) and Xanthodius denticulatus (White, 1848) are included in the Xanthinae. Both have wide geographic distributions in the western Atlantic, extending from Bermuda, Florida, the Gulf of Mexico, West Indies and Venezuela to Brazil (Rocas Atoll and Fernando de Noronha and São Paulo for ?C. parvulus; and St. Paul’s Rocks and from Ceará to Bahia and São Paulo for X. denticulatus) (Melo 1996; Alves et al. 2006). The current taxonomic status of ?C. parvulus is still doubtful (Ng et al. 2008). This species was previously assigned to Leptodius A. Milne-Edwards, 1863 by Lebour (1944), and to Xanthodius Stimpson, 1859 by Martin (1984) and Melo (1996).

The zoal stages of some species of Xanthinae have been described: Leptodius exaratus (H. Milne Edwards, 1834), by Fielder et al. (1979); Micropanope sculptipes Stimpson, 1871, by Andrzejak & Gore (1981); Garthiope barbadensis (Rathbun, 1921), by Gore et al. (1981, as Micropanope barbadensis); Xantho hydrophilus (Herbst, 1790), by Ingle (1883, as Xantho incisus); Cataleptodius floridamus (Gibbes, 1850), by Ingle (1987); Xantho poressa (Olivi, 1792) by Rodriguez & Martín (1997); Xantho pilipes A. Milne Edwards, 1867 by Paula & Santos (2000); and Microcassiope minor (Dana, 1852) by Clark et al. (2004). Lebour (1944) partially described the first zoal stages of both ?C. parvulus (as Leptodius parvulus) and X. denticulatus. However, the evidence from larvae has not been taken into account in evaluating the relationships of these genera within the Xanthinae. Only Lai et al.
Our results agree with the proposal of Ng et al. (2008) that it is not possible to establish the correct taxonomic status of \textit{C. parvulus}. We were able to determine that the morphological features of the first zoeal stage of \textit{C. parvulus} are closest to some zoeae of representatives of the family Panopeidae Ortmann, 1893, as follows: \textit{Hexapanopeus angustifrons} (Benedict & Rathbun, 1891), \textit{Acantholobulus bermudensis} (as \textit{Panopeus bermudensis}) Benedict & Rathbun, 1891 and \textit{H. paulensis} (see Costlow & Bookhout 1966; Martin et al. 1985; Fransozo et al. 1990, respectively). However, the first zoeal stage of \textit{C. parvulus} differs from other panopeid zoeae, such as \textit{Eurypanopeus abbreviatus} (Stimpson, 1860) (Negreiros-Fransozo 1986a), \textit{Panopeus americanus} Saussure, 1857 (Negreiros-Fransozo 1986b), \textit{Panopeus austrobesus} Williams, 1983 (Montú et al. 1988), \textit{Acantholobulus schmitti} (as \textit{Hexapanopeus schmitti}) Rathbun, 1930 (Bakker et al. 1989), \textit{Panopeus meridionalis} Williams, 1983 (Luppi et al. 2003), \textit{Hexapanopeus caribbaeus} (Stimpson, 1871) (Vieira et al. 2004), \textit{Dyspanopeus sayi} (Smith, 1869) (Marco-Herrero et al. 2013), and \textit{Panopeus lacustris} Desbonne, 1867 (Souza et al. 2013).

The above-mentioned discrepancies in the zoeal morphology may represent different evolutionary branches, which reflect the inadequacy of the present taxonomic groupings of xanthoids (Rice 1980; Martin et al. 1985). Detailed morphological studies of the complete larval development of a large number of crab species are needed, and in addition, other kinds of studies such as spermiotaxonomy and/or genetics could help to better delimit the evolutionary relationships among the xanthoid crabs.

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