



Asterocherids (Copepoda: Siphonostomatoida) associated with marine invertebrates in the Strait of Gibraltar

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Abstract

Six years ago, an ongoing sampling programme to seek symbiont copepods was initiated in the Strait of Gibraltar. Most of the copepod species reported in this area (48%) belonged to the families Notodelphyidae and Botryllophilidae and nearly 30% of them were new to science. This paper describes a new species of *Asterocheres* (Asterocheridae, Siphonostomatoida) and redescribes two poorly known species of this genus. *Asterocheres tarifensis* n. sp. was found living in association with *Astroides calycularis*, a coral that hosts a variety of symbiotic copepods. This new species differs from its congeners by the possession of the following combined characters: body cycloform, 21-segmented antennule in female, 2-segmented mandibular palp, siphon reaching the insertion of maxilliped, maxilla without aesthetasc, maxilliped 5-segmented, armature of the antennary exopod consisting of two setae, inner lobe and outer lobe of maxillule each armed with four setae, genital area armed with two setae, fifth leg exopod with three setae, and caudal rami about as long as wide. Furthermore, two poorly known *Asterocheres* species are redescribed revealing some discrepancies with their previous descriptions. *Asterocheres minutus* is characterized by having a 21-segmented antennule, a very short oral siphon, a 1-segmented mandibular palp, and the two lobes of the maxillule with a similar length. The cladistic model of budding hypothesis is proposed for the origin of the two sibling *Asterocheres* species: *A. minutus* and *A. echinicola*. *Asterocheres siphonatus* is distinguished by a combination of characters that include a 21-segmented antennule, an oral siphon extending to the intercoxal plate of leg 4 and the 1-segmented mandibular palp. The controversy concerning the name of this species is also studied.

Key words: symbiosis, Copepoda, Siphonostomatoida, *Asterocheres*, Strait of Gibraltar

Introduction

The Strait of Gibraltar, limited by the meridians of 7°W and 4°E, lying between southernmost Spain and northwesternmost Africa, is the only natural channel connecting the Mediterranean Sea with the Atlantic Ocean. This strait, of approximately 300 metres in depth, is 58 km long and narrows to 13 km between Point Marroquí (Spain) and Point Cires (Morocco). The study of the Strait of Gibraltar is of great zoogeographical interest since the faunas of the Mediterranean and the Atlantic, along one axis, and of Europe and Africa along the other overlap (Medel & López-González 1996).

As a result of this great zoogeographical interest, different groups of marine invertebrates from this area were intensively sampled over a period of six years in order to collect symbiotic copepods. Collections were made from intertidal areas to a depth of 30 metres by snorkelling and SCUBA diving. Hitherto, a total of 45 copepod species have been listed from this region, 13 of which were new to science (Bandera & Conradi 2009; Bandera & Huys 2008; Conradi & López-González 1994; 1996; Conradi, *et al.* 1992; 1993; 1994; 2004; 2006; Ho *et al.* 1998; López-González & Conradi 1995; 1996; López-González *et al.* 1992a; 1992b; 1993; 1997; 1998; 1999a; 1999b). Furthermore, three new genera were described, and a new family, Fratidae Ho, Conradi and López-González 1998, was erected for the new genus *Fratia* Ho, Conradi and López-González 1998 (Bandera & Huys 2008; Ho *et al.* 1998; López-González *et al.* 1998). Since the majority of the marine invertebrates studied to date in search for symbiont copepods were solitary and compound ascidians, most of the copepod species reported in this area (48%)