



A new classification of the Chirostyloidea (Crustacea: Decapoda: Anomura)

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Abstract

The high level classification of the Chirostyloidea Ortmann, 1892, is reviewed. Eumunididae Milne-Edwards & Bouvier, 1900, is resurrected for two genera formerly placed in the Chirostylidae Ortmann, 1892, *Eumunida* Smith, 1883, and *Pseudomunida* Haig, 1979, based on shared characteristics such as the dorsal carapace striation, presence of supraocular spines of the rostrum, dentition of the mandible, presence of an epipod and an annulated exopod flagellum of maxilliped 1. Three families are now included in the Chirostyloidea: Chirostylidae, Eumunididae and Kiwaidae. Diagnoses are provided for each family as well as a key to the families. The fossil record of the Chirostyloidea is discussed, with putative records of *Eumunida* in the fossil record referred to the galatheid genus *Sadayoshia* Baba, 1969.

Key words: Galattheoidea, Chirostylidae, Eumunididae, Kiwaidae, adult somatic morphology, larval morphology, fossil record

Introduction

Recent focus on the phylogeny of Anomura has generated significant molecular phylogenetic information that has challenged the traditional understanding of the marine squat lobsters and porcelain crabs, the Galattheoidea, which comprised the Chirostylidae Ortmann, 1892, Galatheididae Samouelle, 1819, Porcellanidae Haworth, 1825, and Kiwaidae Macpherson, Jones & Segonzac, 2005 (e.g., Ahyong *et al.* 2009; Bracken *et al.* 2009). Most importantly, the Galattheoidea have been shown to be polyphyletic, warranting the removal of the Chirostylidae and Kiwaidae to a separate superfamily, Chirostyloidea (Schnabel *et al.* in press; Ahyong *et al.* in press).

The family Chirostylidae currently includes seven genera and over 200 species worldwide (Baba 2009; Baba & Lin 2008; Baba *et al.* 2008; Schnabel 2009). The chirostylid genera fall into two, apparently natural, groups. One group comprises *Chirostylus* Ortmann, 1892, *Gastroptychus* Caullery, 1896, *Hapaloptyx* Stebbing, 1920, *Uroptychodes* Baba, 2004, and *Uroptychus* Henderson, 1888. The second group includes *Eumunida* Smith, 1883, and *Pseudomunida* Haig, 1979. These two groups were first recognised by A. Milne-Edwards & Bouvier (1894) based on somatic morphology, who informally named the first ‘Diptyciens’, which contained *Ptychogaster* (now *Gastroptychus*) and *Diptychus* (now *Uroptychus*), and the second ‘Eumunidiens’, for *Eumunida*. Several new chirostylid genera have been recognized since 1894. Stebbing (1920) described *Hapaloptyx* for a new species, *H. difficilis*. *Hapaloptyx* is poorly known at present, but is most similar to *Chirostylus*. Haig (1979) erected *Pseudomunida* for a new species, *P. fragilis*, a species having close morphological affinities to *Eumunida*, and corresponding to the ‘Eumunidiens’ group. *Uroptychodes* was erected for *U. epigaster* Baba, 2004, and related species formerly placed in *Uroptychus* (Baba 2004). Recent studies of sperm and larval morphology also support this distinction between groups (e.g., Clark & Ng 2008; Guerao *et al.* 2006; Tudge 1997). Likewise, the two groups appear to have differing life histories, with *Eumunida* producing small eggs in which larvae hatch at an early stage of development (larvae are not currently known for *Pseudomunida*). In contrast, species of the remaining chirostylid genera produce large