



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

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Abstract

The high level classification of the Galatheoidea, popularly known as squat lobsters, has been relatively stable for almost a century. Multiple recent studies of their interrelationships, however, have revealed significant incongruities between the traditional classification and phylogeny. The Aeglidae, Chirostylidae and Kiwaidae were recently removed to other superfamilies. On the basis of previous phylogenetic analyses, we herein revise the higher classification of the remaining Galatheoidea to comprise four families: Galatheidae, Munididae **fam. nov.**, Munidopsidae, and Porcellanidae. The galatheoid families are both morphologically and ecologically distinct. Members of the Munidopsidae are distinguished by the absence or reduction of the maxilliped 1 flagellum and usually occur in outer slope or abyssal habitats. Members of the Munididae **fam. nov.** are united by the trifold or trispinous anterior margin of the carapace and usually occur at outer shelf or slope depths. The Galatheidae includes primarily shallow water species, united by a broad, triangular rostrum, and is most closely related to the porcelain crabs, Porcellanidae. The families of the Galatheoidea are diagnosed and a diagnostic key provided. Extant and fossil genera are listed for each galatheoid squat lobster family.

Key words: Galatheoidea, Galatheidae, Munididae **fam. nov.**, Munidopsidae, Porcellanidae, squat lobsters, phylogeny, classification

Introduction

Phylogenetic concepts underpinning the higher classification of the squat lobsters have been remarkably stable for the best part of a century (Baba 2005; Baba *et al.* 2008; Ahyong *et al.* 2009). Rank assignments have varied but higher taxonomies of the Anomura consistently reflected the widespread view that porcelain crabs and all squat lobsters were closely related. As recently as 2001, the monophyly of the Galatheoidea Samouelle, 1819, including families Aeglidae Dana, 1852, Chirostylidae Ortmann, 1892, Galatheidae Samouelle, 1819, and Porcellanidae Haworth, 1825, was almost universally accepted (Martin & Davis 2001). Correspondingly, the family Kiwaidae Macpherson, Jones & Segonzac, 2005, was also placed in the Galatheoidea. Recent decades, however, have not only witnessed increased interest in the evolution of Decapoda, with a focus on hermit crabs in the case of Anomura (e.g., Cunningham *et al.* 1992; McLaughlin & Lemaitre 1997; Morrison *et al.* 2002), but also the widespread development of powerful methods for studying phylogenetic relationships. As a result, phylogenetic analyses of Anomura have often significantly challenged prevailing concepts of squat lobster interrelationships, although these results have been slower to affect formal classifications (De Grave *et al.* 2009). Pérez-Losada *et al.* (2002) and Ahyong & O'Meally (2004) showed that the freshwater squat lobsters, Aeglidae, are not closely related to the marine squat lobsters and should be excluded from the Galatheoidea; this, McLaughlin *et al.* (2007) formally recognised by establishing the Aegloidea, as well as an independent superfamily for the Kiwaidae in Kiwaoidea. More recent phylogenetic analyses, corroborated by spermatozoal (Tudge 1997) and larval data (Guerao *et al.* 2006; Clark & Ng 2008), went further, revealing significant polyphyly among remaining squat lobsters, widely separating