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A re-appraisal of the systematic status of selected genera in Palaemoninae (Crustacea: Decapoda: Palaemonidae)

SAMMY DE GRAVE[1] & CHRISTOPHER W. ASHELBY[2]

[1]*Oxford University Museum of Natural History, Parks Road, Oxford, OX1 3PW, United Kingdom.*
E-mail: sammy.degrave@oum.ox.ac.uk
[2]*APEM Ltd., Diamond Centre, Works Road, Letchworth Garden City, SG6 1LW, United Kingdom. E-mail:c.ashelby@apemltd.co.uk*

Abstract

Recent phylogenetic work (Ashelby *et al.*, 2012) has demonstrated the need for a fresh appraisal of the systematic status of some Palaemoninae genera. In the present contribution the accumulated morphological as well as molecular evidence is reviewed. The genera *Palaemonetes*, *Exopalaemon* and *Coutierella* are demonstrated to be junior synonyms of *Palaemon*, which now contains 83 species. As a result of this systematic re-arrangement, two replacement names are needed. *Palaemon kwantung* **nom. nov.** now replaces *Exopalaemon guangdongensis* Guo, Wang & Zhang, 2005, nec *Palaemon guangdongensis* Liu, Liang & Yan, 1990. *Palaemon mundusnovus* **nom. nov.** is the replacement name for *Palaemonetes intermedius* Holthuis, 1949, nec *Palaemon intermedius* (Stimpson, 1860).

Key words: Decapoda, Palaemonidae, *Palaemon*, *Palaemonetes*, *Coutierella*, *Exopalaemon*, systematics

Introduction

In recent years, considerable strides have been taken in deriving a stable and usable classification for caridean shrimps, with De Grave et al. (2009) setting out a framework at family and generic level integrated with, and comparable to, the other groups in Decapoda. This was followed by the global checklist of species in De Grave & Fransen (2011) perhaps generating the impression of a fully resolved taxonomy and systematic arrangement. However, in tandem with these compilations and perhaps partly due to their holistic overview, recent years have seen a renewed interest in resolving long standing systematic controversies, as well as attempts to place the classification of caridean shrimps on a more natural footing, following Darwinian principles. Much of this research has focussed on higher systematic levels, such as resolving the position of the enigmatic family Procarididae (see Bracken *et al.* 2010) and the continued usage of superfamilies (see Li *et al.* 2011). However, due to the growing usage of genetic analysis in biology in general, and systematics in particular, much focus has also been devoted to resolving more basic taxonomic and systematic questions, such as delineation of species and genera. Due to the species-rich nature and world-wide distribution of Palaemonidae, it is no surprise that this family has been scrutinised in recent years in this regard. Although many questions remain unanswered, especially in relation to the existence of the two subfamilies, Palaemoninae and Pontoniinae, or indeed the phylogenetic relationships amongst pontoniine genera and species, significant progress has been made in the last decade or so regarding the systematics of the subfamily Palaemoninae.

Pereira (1997) performed one of the first cladistic analysis of its kind on Palaemoninae, based on a matrix of 81 characters and 172 species. His results demonstrated considerable paraphyly at various levels, including the potential inclusion of several Palaemoninae genera (*Brachycarpus*, *Leander*, *Leandrites*) in Pontoniinae. At a lower taxonomic level, paraphyly was demonstrated in three of the major Palaemoninae genera, *Palaemon*, *Palaemonetes* and *Macrobrachium*. Following this, Murphy & Austin (2003) carried out a phylogenetic study using partial 16S sequences on Australian species of the subfamily, and found that *Macrobrachium intermedium* (Stimpson, 1860), *Palaemon serenus* Heller, 1862 and *Palaemonetes australis* Dakin, 1915 are so closely related,

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The only morphological difference between *Macrobrachium* and *Cryphiops*, as currently defined is the presence versus absence of a hepatic spine on the carapace, not only a character of major importance in the delineation of Palaemoninae genera but also of considerable usage in any generic-level key (see Holthuis 1993), although Short (2004) discusses some variability in *Macrobrachium*. As discussed above, *Palaemon* as herein constituted is potentially paraphyletic and in time, one or more other genera may need to be constructed for those species falling outside the main *Palaemon* clade in Ashelby *et al.* (2012). Finally, it is noted that another two genera in Palaemoninae, *Leander* Desmarest, 1849 and *Leandrites* Holthuis, 1950a, are also only separated from each other by the presence versus absence of the mandibular palp. Although Pereira's (1997) analysis hints at a particularly close relationship of both genera, at present no genetic study has included members of both genera. As such, no conclusion can be reached regarding their true systematic status. It is thus clear that all systematic issues at generic level within Palaemoninae are not yet fully resolved and a further re-appraisal of morphological characters at generic-level, combined with further genetic work needs to be undertaken before a stable classification is derived.

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