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## Morphological and molecular data support the distinctiveness of *Pachycheles laevidactylus* Ortmann, 1892 and *Pachycheles chubutensis* Boschi, 1963 (Anomura, Porcellanidae)

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### Abstract

*Pachycheles chubutensis* Boschi, 1963 and *Pachycheles laevidactylus* Ortmann, 1892 are species with a distribution restricted to rocky shores in southeastern America, that share a troubled taxonomic history. Morphological characters overlap and identification can be imprecise, when both species coexist in the same environment. Due to these partly unsolved species demarcations, the present study addresses the taxonomic status of *P. chubutensis* and *P. laevidactylus* based on morphological comparisons and on 16S mtDNA and H3 nDNA sequences. We found out that morphological traits of chelipeds (pattern of carapace granulation, number/shape of teeth on the anterior margin of carpus and presence of setae on carpus and propodus) are reliable characters supporting the separation of the species. Molecular data based on two partial gene fragments (16S and H3) show separation among representatives of these species in two different clusters. Our comparative investigation shows that combined evidence distinguishes *P. chubutensis* from *P. laevidactylus*, but they remain closely related species. Forthcoming research focused on adding representative taxa for the combination of molecular and morphological information of the genus *Pachycheles* will investigate the positions of these two species within the *Pachycheles* group and help to clarify the enigmatic status of this genus in the family Porcellanidae.

**Key words:** phylogenetic, porcelain crabs, taxonomy, South America

### Introduction

Porcellanidae Haworth, 1825 is a worldwide distributed family of anomuran crustaceans, commonly known as porcelain crabs. Its members occur primarily in intertidal and sublittoral zones of tropical and subtropical regions where they occupy specialized habitats such as rocky shores, depressions under stones, worm tubes, cavities of sponges, gaps inside adhesive discs of macroalgae, and in coral reefs (Haig 1960; Viviani 1969; Smaldon 1972; Werding *et al.* 2003). Most species are free-living, but some have adopted a symbiotic lifestyle (Haig 1960; Werding 1977; Baeza & Thiel 2000; Baeza & Stotz 2001; Meireles & Mantelatto 2008).

The Porcellanidae encompass about 280 valid species distributed over 30 genera (Osawa & McLaughlin 2010). Nearly half of these species have been recorded from the Americas (Werding *et al.* 2003; Rodríguez *et al.* 2006), of which 48 valid species and two undescribed species grouped into 11 genera occur in the western Atlantic (Rodríguez *et al.* 2005). In the last 50 years, this number increased from 31 to 48, with the addition of newly collected and described cryptic species in the Western Atlantic (Werding & Hiller 2002; Rodríguez *et al.* 2005). Despite their common mention in taxonomic accounts and ecological literature, phylogenetic relationships of porcellanids are poorly understood and a worldwide analysis is required (Haig 1956, 1960; Werding *et al.* 2001; Rodríguez *et al.* 2005, 2006; Osawa & McLaughlin 2010), as well as the clarification of specific cases in which the taxonomic rank of species is doubtful.

The genus *Pachycheles* Stimpson, 1858, is the second most speciose member of the family and includes over

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