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Taxonomic study of the *Pagurus forbesii* "complex" (Crustacea: Decapoda: Paguridae). Description of *Pagurus pseudosculptimanus* sp. nov. from Alborán Sea (Southern Spain, Western Mediterranean Sea)

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Abstract

Study of hermit crabs from Alboran Sea has allowed recognition of two different morphological forms under what had been understood as *Pagurus forbesii*. Based on morphological observations with various species of *Pagurus*, and molecular studies, a new species is described as *P. pseudosculptimanus*. An overview of species of *Pagurus* from the eastern Atlantic and Mediterranean Sea is provided.

Key words: *Pagurus*, new species, Mediterranean, eastern Atlantic

Introduction

More than 170 species from around the world are currently assigned to the genus *Pagurus* Fabricius, 1775 (Lemaitre and Cruz Castaño 2004; Mantelatto *et al*. 2009; McLaughlin 2003; McLaughlin *et al.* 2010). This genus is complex because there is high morphological variability and similarity among some species, and has it been divided in groups (e.g., Lemaitre & Cruz Castaño 2004, for eastern Pacific species; Ingle 1985, for European species) with difficulty (Ayón-Parente & Hendrickx 2012). This difficulty has lead to taxonomic problems, although molecular techniques have been recently used to elucidate some species (Mantelatto *et al.* 2009; Da Silva *et al*. 2011).

Thirteen species are present in eastern Atlantic (European and the adjacent African waters) (Ingle 1993; Udekem d'Acoz 1999; Froglia 2010, MarBEL Data System - Türkay 2012; García Raso *et al.* 2014) but only nine of these (the first ones mentioned below) have been cited in the Mediterranean Sea; all are present in the study area (Alboran Sea, southern Spain). These are: *Pagurus alatus* Fabricius, 1775; *Pagurus excavatus* (Herbst, 1791); *Pagurus prideaux* Leach, 1815; *Pagurus pubescentulus* (A. Milne-Edwards & Bouvier, 1892), *Pagurus mbizi* (Forest, 1955); *Pagurus cuanensis* Bell, 1846; *Pagurus forbesii* Bell, 1846; *Pagurus anachoretus* Risso, 1827; *Pagurus chevreuxi* (Bouvier, 1896); *Pagurus irregularis* (A. Milne-Edwards & Bouvier, 1892); *Pagurus carneus* (Pocock, 1889); *Pagurus bernhardus* (Linnaeus, 1758) and *Pagurus pubescens* Krøyer, 1838.

Among the European species of *Pagurus*, only *P. forbesii* and *P. cuanensis* are characterized by having long eyestalks and the males with four left pleopods 2–5 (Zariquiey Álvarez 1968; Ingle 1993). These two species also show a wide eastern Atlantic distribution, and are found in British Isles, Ireland, Norway to Africa: Senegal and South Africa respectively, and in the Mediterranean Sea.

We have identified two different morphologies associated with the hermit crab *Pagurus forbesii*, in large samples from the Alboran Sea. Thus, the aim of the present study is to clarify the situation, based on morphological and molecular data.

Pagurus forbesii was described by Bell in "*A history of British Crustacea* IV", dated 1846 (although this publication (part) was on sale during the last week of December 1845, (Ingle 1985)), and the type locality is Falmouth (UK). On the other hand, Lucas described *Pagurus sculptimanus* (1846) from Oran. These two species

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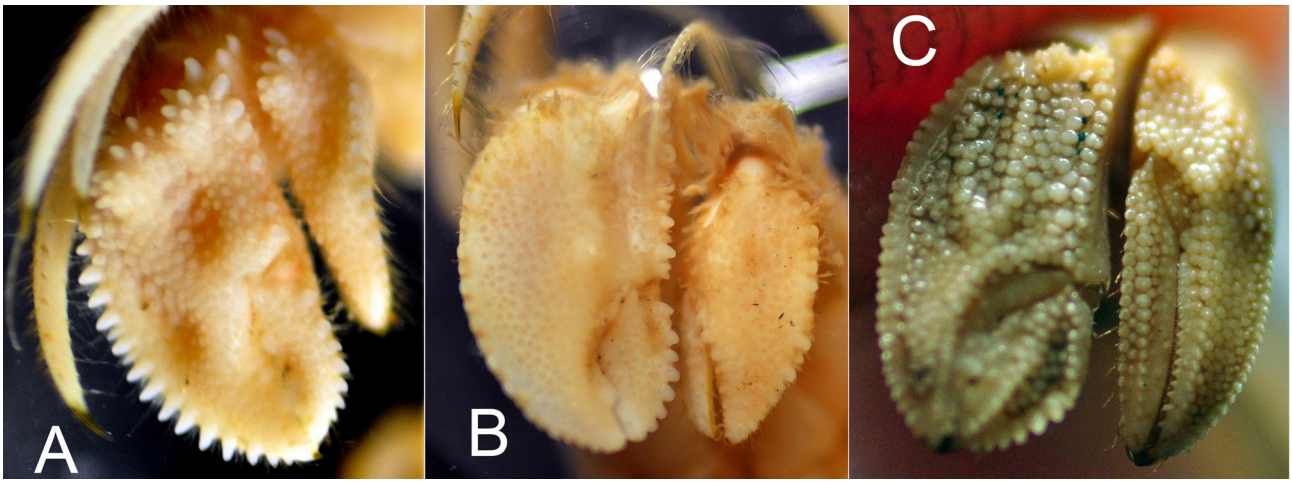

FIGURE 13. Junction of both chelipeds to close the mouth of the shell in: A, *Pagurus forbesii*; B, *Pagurus pseudosculptimanus* **n. sp.**; C, *Pagurus alcocki* (MNHN-IU-2009.2296).

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