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## Hermit crabs (Decapoda: Crustacea) from deep Mauritanian waters (NW Africa) with the description of a new species

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### Abstract

Thirteen hermit crab species of the families Diogenidae, Paguridae and Parapaguridae were captured in deep waters off Mauritania during Maurit surveys. A new species of the genus *Paguristes*, *Paguristes candelae* n. sp., is described. *Areopaguristes mauritanicus* n. comb. is proposed for *Paguristes mauritanicus* Bouvier, 1906 and *Pseudopaguristes marocanus* n. comb. for *Paguristes marocanus* A. Milne-Edwards & Bouvier, 1892; the females of the latter species are reported for the first time. Our data extends the geographical distribution of *Pseudopaguristes marocanus* southwards and that of *Paragiopagurus macrocerus* northwards. Both species, together with *Diogenes pugilator* (Roux, 1829), are recorded for the first time in Mauritanian waters. New data about bathymetric ranges are also reported for *Pseudopaguristes marocanus* n. comb., *Areopaguristes mauritanicus* n. comb. and *Paragiopagurus macrocerus*.

**Key words:** Diogenidae, Paguridae, Parapaguridae, *Areopaguristes*, *Pseudopaguristes*, *Paguristes* new species, Mauritania, deep-sea

## Introduction

A. Milne-Edwards & Bouvier (1891, 1892, 1900) and Bouvier (1906) were the first authors to describe hermit crabs in West African waters, but current knowledge in this area is mainly based on the works of Forest (1952a–f, 1953, 1954a, 1955, 1956, 1961, 1966, 1978). Additional data can be found in general studies on crustaceans or decapods, such as those by Stebbing (1908) and Barnard (1950) in South African waters, Maurin (1968) in Northwest Africa and, more recently, in papers by Macpherson (1983) from Namibia, García-Raso (1996) from the Ibero-Moroccan Gulf and Muñoz *et al.* (2012) from Guinea-Bissau.

The review of the family Parapaguridae in the East Atlantic (Lemaitre 1990) and the monograph on hermit crabs in the Northeast Atlantic (Ingle 1993) provided detailed descriptions and clarified the taxonomic status and synonymies of the known species in this area. Consequently, this group is well known in the East Atlantic, although some areas remain poorly studied.

Hermit crabs from Mauritanian waters known to date are cited in the checklist of Monod (1933) and in some of the above-mentioned literature. However, no published works have exclusively dealt with hermit crabs in Mauritanian waters.

From 2007 to 2010, the Maurit surveys systematically sampled the entire Mauritanian coast, resulting in the most significant collection of hermit crabs ever captured in this area. This work presents the results of the study of this collection.

## Material and methods

The Maurit surveys were carried out annually in November and December from 2007 to 2010 onboard the Spanish R/V Vizconde de Eza. A total of 291 stations were sampled at depths from 80 to 2000 m with a commercial trawl (Lofoten type) following a random stratified sampling methodology. Additionally, 25 stations distributed along five transects perpendicular to the coastline in five bathymetric strata (150, 300, 500, 1000 and 1500 m) were sampled with a 3.5 m-wide Agassiz trawl (see Map 1).

Hermit crabs were captured at 83 stations: 71 were sampled with the Lofoten trawl and 12 with the Agassiz trawl. At each station the hermit crabs were carefully sorted from the total catch, photographed and subsequently preserved in 70% ethanol for further studies in the laboratory. The list of species collected by station and data from each station is given in Table 1.

The classification adopted in this work follows Ahyong *et al.*'s (2011) scheme to the family level. Species assignments to family follow McLaughlin *et al.* (2010). Families, genera and species are listed in alphabetical order.

For each species, we provide relevant literature with descriptions and figures, and recent references to distribution in the region. Comprehensive former literature references can be checked in Alcock (1905) and Gordan (1956). For the uncommon species, *Pseudopaguristes maroccanus* n. comb. and *Paragiopagurus macrocerus* (Forest, 1955), we include all the available literature to date. The material examined includes station code (station data can be checked in Table 1), number of specimens (in brackets) and maximum and minimum shield lengths for males, females and ovigerous females, measured from the tip of the rostrum or midpoint of the rostral lobe to the midpoint of the posterior margin of the shield. Type specimens and additional material examined were also included for some species. In addition we provide some comments about habitat, including sediment type, inhabited shells and symbionts, both from literature and from our data. Finally, the bathymetric and geographical distributions were summarized and remarks were added when necessary.

Pictures were taken with a motorized Nikon SMZ25 stereomicroscope, using NIS-Elements Microscope Imaging Software with an Extended Depth of Focus (EDF) patch.

Specimens are deposited in the University of Vigo (Spain) (Marine Zoology Laboratory) and in the Instituto Español de Oceanografía (Oceanographic Centres of Cádiz and Málaga, Spain). The holotype and one paratype of the new species are deposited in the Museo Nacional de Ciencias Naturales (Madrid, Spain); a second paratype is deposited in the Invertebrate Collection of the Marine Zoology Laboratory (University of Vigo, Spain).

Tristan da Cunha Island; western Atlantic, from off Nova Scotia (Canada) to Guyana (Lemaitre 1989, 1990). The species was also reported from Walvis Ridge (Cardoso & Lemaitre 2012).

The recorded depth range is between 102 and 3864 m, but the species is mainly reported from 400 to 1400 m (Lemaitre 1989). Our specimens were mostly captured between 1100 and 1600 m. In the same area, recent remote operated vehicle (ROV) observations located *P. pilosimanus* and its symbiont zoanthid *Epizoanthus paguriphilus* at 1400–1500 m depth (Jones & Brewer 2012).

**Remarks.** Our specimens concur with the descriptions and figures given by Lemaitre (1986, 1989) and can be distinguished from other allied species in the area by its unarmed mesial and lateral faces of meri, carpi and propodi of the ambulatory pereopods; the symmetrical posterior lobes of the telson; and the presence of 2 or 3 irregular rows of conical scales on the propodal rasp of the fourth pereopods.

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