

SCIENTIFIC NOTE

Three new records of Porcellanidae (Decapoda, Anomura) to Eastern Cuba

Tres nuevos registros de Porcellanidae (Decapoda, Anomura) para Cuba oriental

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Abstract

The diversity of marine crabs (Anomura and Brachyura) of Cuba is well known. However, the poorly-known species distribution represents a challenge for conservation. The Cuban porcellanid crabs have been recently checked, however, the knowledge of this group remains underestimated. In this work, three species of porcellanid crabs, *Petrolisthes galathinus*, *P. jugosus*, and *P. tonsorius* are recorded to Eastern Cuba. Furthermore, the distribution of *P. quadratus* in this area is revised because several specimens were mixed with *P. tonsorius*. With these new records, 12 porcellanid species are registered for this region.

Keywords: Crustacea, marine biodiversity, new records, *Petrolisthes*.

Resumen

La diversidad de cangrejos marinos (Anomura y Brachyura) de Cuba es bien conocida. No obstante, el pobre conocimiento sobre la distribución de las especies representa un reto para la conservación. Los cangrejos porcelánidos cubanos han sido revisados recientemente, sin embargo, el conocimiento sobre este grupo continúa subestimado. En este trabajo, tres especies de cangrejos porcelánidos, *Petrolisthes galathinus*, *P. jugosus* y *P. tonsorius*, son registradas para Cuba oriental. Además, la distribución de *P. quadratus* en esta área es revisada, dado que varios ejemplares estaban mezclados con *P. tonsorius*. Con estos registros, 12 especies de porcelánidos han sido registradas en esta región.

Palabras clave: Crustacea, biodiversidad marina, nuevos registros, *Petrolisthes*.

Introduction

The fauna of porcellanid crabs of Cuba has been revised during the last decade (Diez & Jover, 2013, 2015; Diez & Lira, 2017). Twenty-three species have been recorded from the archipelago, belonging to the genera *Clastocheuchus* Haig, 1960, *Madarateuchus* Harvey, 1999, *Megalobrachium* Stimpson, 1958,

Neopisosoma Haig, 1960, *Pachycheles* Stimpson, 1958, *Parapetrolisthes* Haig, 1962, *Petrolisthes* Stimpson, 1858, *Polyonyx* Stimpson, 1858, and *Porcellana* Lamarck, 1801. *Petrolisthes* is the most speciose genus with 11 recorded species from Cuba. The biogeographic relationships of the Cuban porcellanids have also been explored at local and regional scales (Diez & Lira, 2017). However, the distribution of these animals in the archipelago is poorly known. In this paper, three species of Porcellanidae are recorded to Eastern Cuba, and the distribution of *P. quadratus* in Santiago de Cuba is updated.

Material and methods

The porcellanid crabs were collected in the provinces of Santiago de Cuba (Siboney and Sardinero) and Holguín (El Cayuelo), southeastern and northeastern coasts of Cuba, respectively (Fig. 1). The specimens were collected subtidally under rocks during the low tide. Sardinero (19°57'34"N, 75°47'01"W) is a small cove

with diverse ecosystems. In the mouth of a river, there is a mangrove of *Rhizophora mangle* Linnaeus, and also there are seagrass beds of *Syringodium filiforme* Kützing and *Thalassia testudinum* K. D. Koenig. The cove is protected by coral hills, and in the middle area, there is a coral rubble field (where the specimens were collected; 0.5 m deep). The specimen from Siboney (19°57'34"N; 75°42'07"W) was collected in a small harbour on the eastern side of the beach (0.3 m deep). This harbour is located at the mouth of Siboney River. El Cayuelo (21°07'46"N; 75°49'08"W) is located in the eastern side of Guardalavaca Beach, Banes municipality. It is a shallow beach mostly covered by seagrass (specimens collected at 0.6 m deep).

The specimens were preserved in 70% ethanol and studied under a stereomicroscope (Novel NSZ-606). Posteriorly, they were photographed with a camera Nikon D3500 and the size was referenced with a graph paper. Measures (length and width of the carapace) were taken using the software ImageJ. The photographs

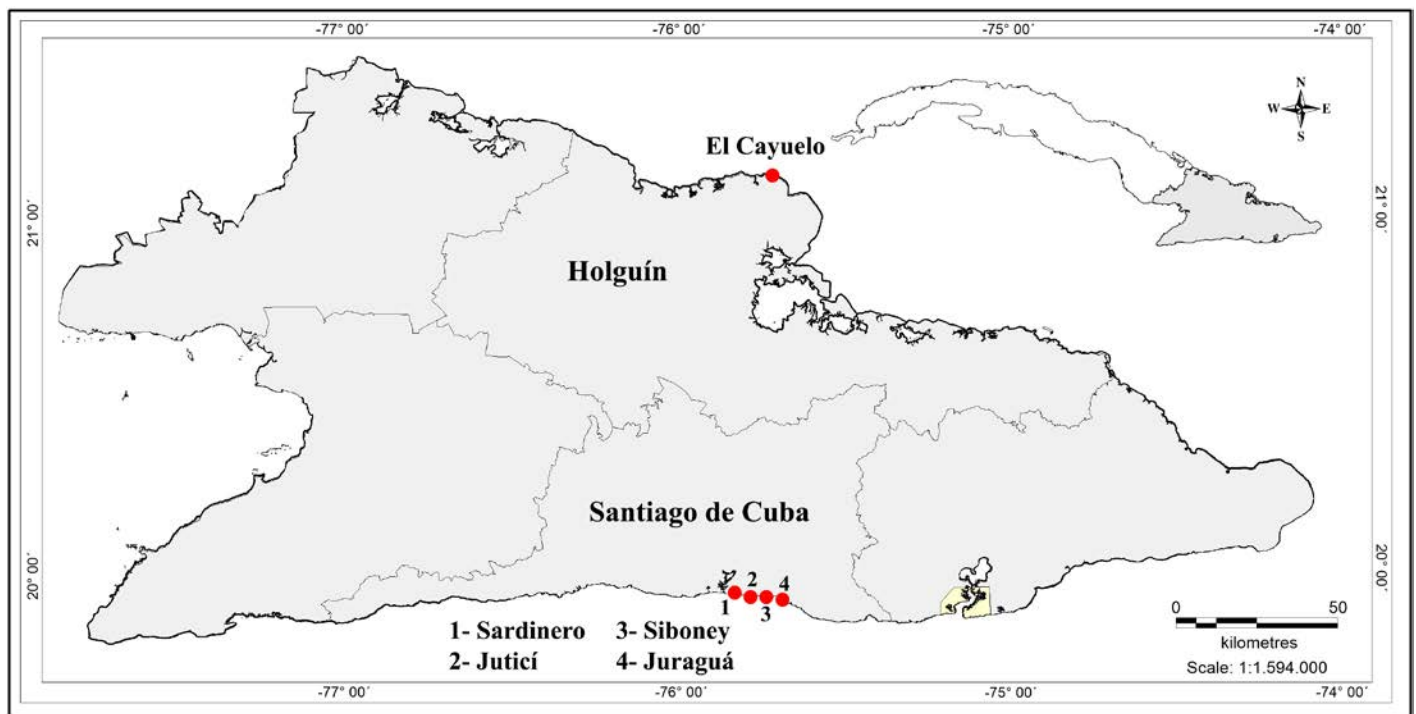


Fig. 1. Map of the sampled localities.

were processed with Adobe Photoshop CC 2019. The material of *P. quadratus* Benedict, 1901 stored at the Zoology Laboratory of Universidad de Oriente, Cuba, and studied by Diez and Jover (2013) was revised. All the material, including the specimens of *P. quadratus*, was deposited in the Museum Charles Ramsden de la Torre from Universidad de Oriente; the acronym of the crustacean collection is IC. The taxonomical identification was done following Diez and Lira (2017) and Ferreira and Anker (2021).

Results

Three species of porcellanid crabs, previously unknown from Eastern Cuba, were identified. These species are *Petrolisthes galathinus*, *P. jugosus*, and *P. tonsorius*. Furthermore, the distribution of *P. quadratus* in Santiago de Cuba is updated. Specimens of this species, previously studied by Diez and Jover (2013), were found mixed with *P. tonsorius*. The systematics classification, distribution data, and examined material are listed below.

Infraorder Anomura MacLeay, 1838
 Superfamily Galatheoidea Samouelle, 1819
 Porcellanidae Haworth, 1825
Petrolisthes Stimpson, 1858

Petrolisthes galathinus (Bose, 1802) (Fig. 2A-C)

Known distribution in Cuba: Gulf of Batabanó (Juan García, Cantiles and Diego Pérez Cays) (Martínez-Iglesias & Alcolado, 1990), Sabana-Camagüey Archipelago, and Pinar del Río (María La Gorda) (Diez & Lira, 2017).

Examined material: Sardinero (two juveniles, one adult male and two female) (February 16, 2019) (IC82). The carapace of the adult specimens measures 8.1–10.1 mm long (\bar{x} = 9.2 mm; n = 3) and 7.3–9.3 mm wide (\bar{x} = 8.6 mm; n = 3).

Petrolisthes jugosus Streets, 1872 (Fig. 2D–F)

Known distribution in Cuba: Gulf of Batabanó (Juan García Cay) (Martínez-Iglesias & Alcolado, 1990); Mayabeque (Boca Canasí) (Barro *et al.*, 2013; see Diez & Lira, 2017).

Examined material: Sardinero (one ovigerous female) (February 16, 2019) (IC83). The carapace is 3.2 mm long and 3.6 mm wide.

Petrolisthes quadratus Benedict, 1901 (Fig. 3A–C)

Known distribution in Cuba: Holguín (Naranjo Bay) (Diez & Lira, 2017), Santiago de Cuba (Aguadores, Siboney and Juticí) (Diez & Jover 2013, 2015). Specimens recorded from Juraguá (Santiago de Cuba) by Diez and Jover (2013) are now identified as *P. tonsorius*.

Examined material: Juticí (one adult male and one female) (June 16, 2012) (IC84). The carapace is 5.2–5.3 mm long and 5.5–5.6 mm wide (n = 2). Siboney (one adult male) (February 1st, 2015) (IC85). The carapace is 5.2 mm long and 5.3 mm wide.

Petrolisthes tonsorius Haig, 1960 (Fig. 3D)

Known distribution in Cuba: Unspecified (Martínez-Iglesias, 2007).

Examined material: Juraguá (three adult males and one ovigerous female) (May 6, 2012) (IC86). The carapace measures 3.9–7.2 mm long (\bar{x} = 5.6 mm; n = 4) and 4.0–7.9 mm wide (\bar{x} = 5.8 mm; n = 4). Juticí (three adult males, two females, and one ovigerous female) (June 19, 2012) (IC87). The carapace measures 4.3–7.0 mm long (\bar{x} = 5.8 mm; n = 6) and 4.9–6.7 mm wide (\bar{x} = 8.6 mm; n = 6). El Cayuelo (one male specimen) (May 15, 2019). The carapace measures 4.2 mm long and 4.3 mm wide (IC88).

Discussion

Two of the collected species, *P. galathinus* and *P. jugosus*, have a wide distribution in the Caribbean (Werding *et al.*, 2003; Poupin & Lemaitre, 2014; Ferreira & Anker, 2021), however, their



Fig. 2. Species of Porcellanidae recorded from Eastern Cuba. A–C: *Petrolistes galathinus*, male specimen from Sardinero. D–E: *Petrolistes jugosus*, ovigerous female from Sardinero. A–B & D: dorsal view; C & E–F: ventral view. A: colouration of the live animal. B–F: colouration after fixation in 70% ethanol.

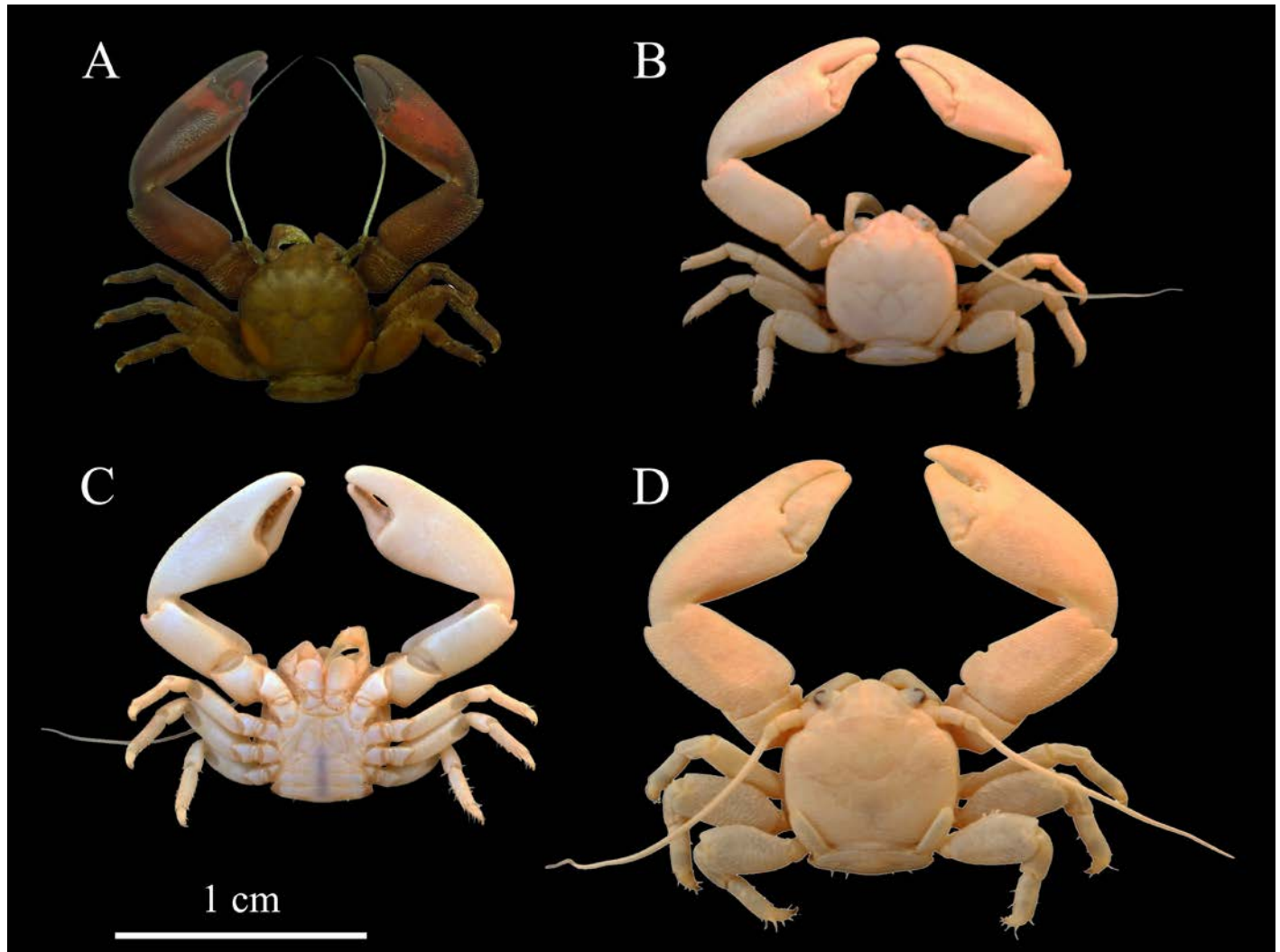


Fig. 3. Species of Porcellanidae recorded from Eastern Cuba. A–C: *Petrolisthes quadratus*, male specimen from Siboney. D: *Petrolisthes tonsorius*, male specimen from Juticí. A–B & D: dorsal view. C: ventral view. A: colouration of the live animal. B–D: colouration after fixation in 70% ethanol.

distribution at local scales is strongly unknown (see Diez & Lira, 2017). The third species, *P. tonsorius*, is a transisthmian species that has been recorded for a few localities in the Caribbean (Poupin, 2018; Ferreira & Anker, 2021). As for many marine invertebrates, the porcellanids' distribution in the Cuban platform's ecoregions is poorly known. This is the first record of *P. tonsorius* from a specific locality in Cuba. Diez and Lira (2017) discussed that for some

porcellanids recorded from Cuba the exact distribution is unknown. Eight porcellanids were previously recorded from Santiago de Cuba (Diez & Jover, 2013, 2015). With these new records, 11 species have been collected on the southeastern coast, representing about 50% of all Cuban species. *Petrolisthes tonsorius* is the fourth species of Porcellanidae recorded on the northeastern coast of Cuba; only *P. armatus* (Gibbes, 1850), *P. quadratus*, and *Polyonyx*

gibbesi Haig, 1956 were previously recorded from that area (Diez & Lira, 2017).

Petrolisthes jugosus is a well-known, morphologically diagnosed species. The carpus of the first pereopods with longitudinal crests on the dorsal surface and four large serrated teeth along the mesial margin, and a telson with five plates, allow assigning the specimen collected in Santiago de Cuba to this species. Otherwise, *P. galathinus* and *P. tonsorius* are species with a controversial identification. The first of these two species is considered a species complex based on morphology and molecular phylogeny (Hiller *et al.*, 2006). Recently, Ferreira and Anker (2021) depicted the wide morphological variation of *P. galathinus* through different populations. The specimens from Santiago de Cuba (Fig. 2A) are more similar in colour and colour pattern to those from Bocas del Toro, Panama (see Ferreira & Anker, 2021: Fig. 47A).

Petrolisthes tonsorius and *P. quadratus* are morphologically similar species, and, therefore, were misidentified by Diez and Jover (2013). However, three characteristics allow to differentiate *P. tonsorius* from *P. quadratus*: 1- the carpus of the chelipeds are wider, bearing an anterior 'wing'; 2- the merus of the chelipeds bear a posterior ridge; and 3- the meri of the ambulatory legs are wider (Werding, 1977; Ferreira & Anker, 2021). *Petrolisthes tonsorius* shows a wide variety of colour and colour patterns, however, according to Hiller and Werding (2019), the different populations correspond to a single species. The specimens from Cuba are more or less brownish to greenish with darker chelipeds, a pattern described in other Caribbean populations (Werding, 1977) and well different from the blueish morph (see Hiller & Werding, 2019: Fig. 1B; Ferreira & Anker, 2021: Fig. 90E).

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Conflict of interest

The author has no financial or non-financial conflicts of interest to declare that are relevant to the content of the manuscript.

Ethical behaviour

The author has followed all applicable international, national, and institutional recommendations related to the use and handling of animals for research.

Permits for sampling and other permits

No permits were required for the conduct of this research.

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