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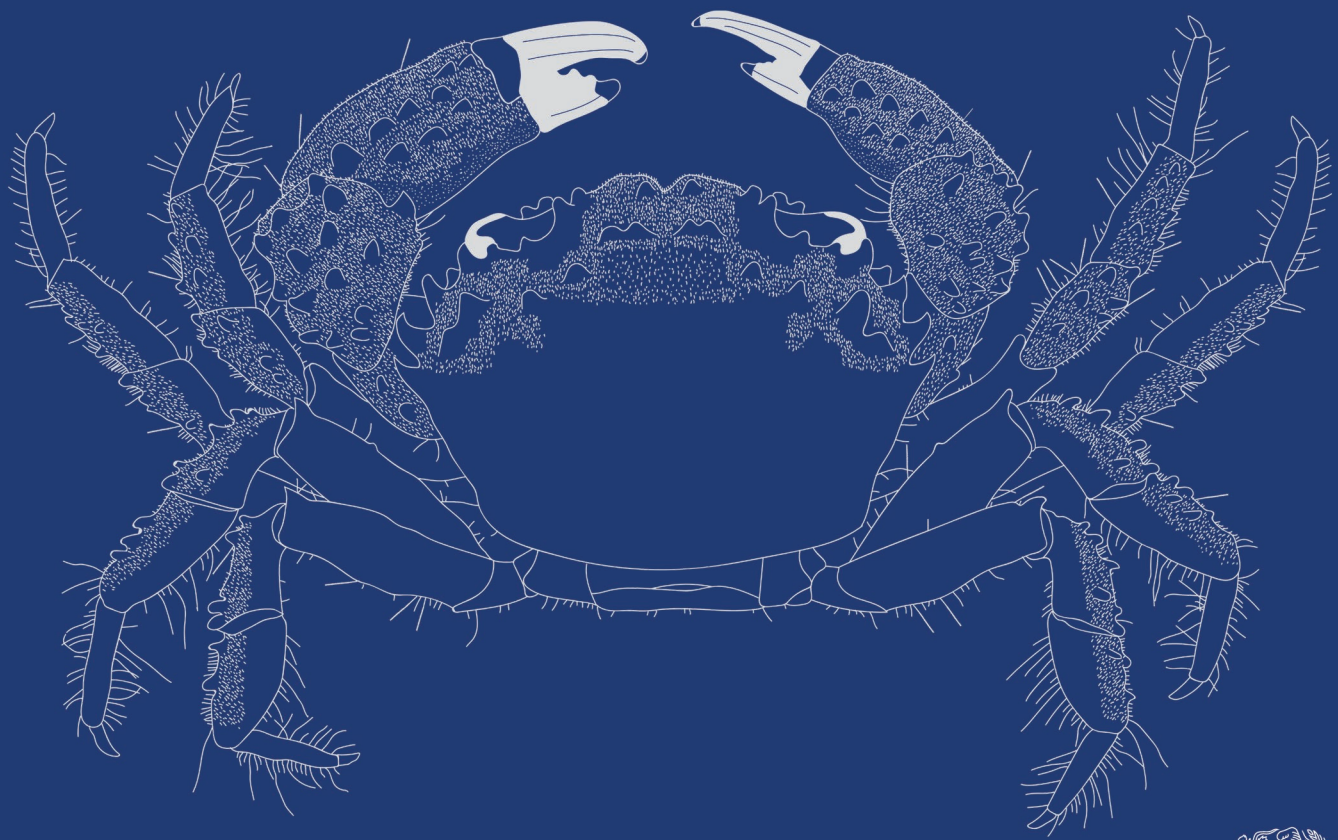

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Holotype of *Pilumnus guadeloupensis* n. sp., male (CW = 6.44 mm), MNHN-IU-2013-16321.

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A new species of *Pilumnus* Leach, 1816 (Decapoda, Brachyura) from Guadeloupe, Lesser Antilles, with morphological comparisons to regional congeners

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ABSTRACT
Pilumnus Leach, 1861 is a speciose cosmopolitan genus of marine crabs typical from rocky and coral coastal environments and known to occur in tropical and temperate oceans and seas worldwide, including the waters of western Atlantic and Caribbean Sea surrounding the Lesser Antilles, a recognized hotspot of biodiversity in Caribbean. Despite recent sampling efforts, this region remains underexplored, limiting understanding of its marine fauna. To address this gap, several field expeditions have been carried out, including KARUBENTHOS 2012. This expedition extensively collected specimens of various taxonomic groups, expanding documentation of biodiversity in the Lesser Antilles. Among collections, a unique specimen of *Pilumnus* was recognized and analyzed through morphological and molecular approaches. Genetic analyses of this specimen, a component of molecular phylogenetic studies previously conducted by our team, confirmed its divergence from previously described species. Herein, we performed a thorough morphological examination analyzing most of the taxonomic informative characters used in species descriptions of representatives of *Pilumnus*. Based on the presently accessed morphological features and previously detected molecular divergence, a new species, *Pilumnus guadeloupensis* n. sp., is described. This species can be distinguished from others from the genus mainly by the ornamentation and tuberculation patterns of pereopods, number of anterolateral prominences and shape of the carapace. Detailed morphological comparisons with congeners, alongside a comprehensive review of the literature, are provided.

KEY WORDS
Caribbean, KARUBENTHOS 2012, morphology, Pilumnidae, new species.

RÉSUMÉ
Une nouvelle espèce de Pilumnus *Leach, 1816 (Decapoda, Brachyura) de Guadeloupe, Petites Antilles, et comparaisons morphologiques avec les espèces régionales apparentées.*
Pilumnus Leach, 1861 est un genre cosmopolite de crabes marins, typique des environnements côtiers rocheux et coralliens. Ces animaux sont présents dans les océans et mers tropicaux et tempérés du monde entier, notamment dans les eaux de l'Atlantique ouest et la mer des Caraïbes, y compris dans les eaux entourant les Petites Antilles, un point chaud de biodiversité en région caraïbe. Malgré de récents efforts d'échantillonnage, cette région reste sous-explorée, ce qui limite la connaissance de sa faune marine. Pour combler cette lacune, plusieurs expéditions de terrain ont été menées, dont KARUBENTHOS 2012. Cette expédition a permis de collecter de nombreux spécimens de divers groupes taxonomiques, enrichissant ainsi nos connaissances sur la biodiversité des Petites Antilles. Parmi les spécimens collectés, un spécimen unique de *Pilumnus* a été identifié et analysé par des approches morphologiques et moléculaires. Les analyses génétiques de ce spécimen, réalisées dans le cadre d'études de phylogénie moléculaire précédemment menées par notre équipe, ont confirmé sa divergence avec les espèces précédemment décrites. Un examen morphologique approfondi analysant la plupart des caractères taxonomiques informatifs utilisés dans les descriptions des espèces de *Pilumnus* a été réalisé. Sur la base des caractéristiques morphologiques décrites dans cette étude et des divergences moléculaires précédemment détectées, une nouvelle espèce, *Pilumnus guadeloupensis* n. sp., est décrite. Cette espèce se distingue des autres espèces du genre principalement par l'ornementation et les tubercules des péréiopodes, le nombre de proéminences antérolatérales et la forme de la carapace. Des comparaisons morphologiques détaillées avec ses congénères, ainsi qu'une revue exhaustive de la littérature, sont fournies.

MOTS CLÉS
Caraïbes,
KARUBENTHOS 2012,
morphologie,
Pilumnidae,
espèce nouvelle.

INTRODUCTION

Pilumnus Leach, 1816 is a genus of decapod crustaceans that includes common representatives inhabiting rocky shores, sand bottoms, and coral reefs in intertidal and subtidal waters (Melo 1996; Moraes *et al.* 2015; Fahimi *et al.* 2021). Commonly referred to as "hairy crabs", species of *Pilumnus* are cosmopolitan organisms found in both tropical and temperate regions. Currently, the genus comprises 145 species (Magalhães *et al.* 2021; Poore & Ahyong 2023; Takeda 2024; DecaNet – WoRMS 2026). Despite the high number of described species, many have been recognized only from recent studies, suggesting that the diversity of congeners remains underestimated (Magalhães & Felder 2019; Takeda & Komatsu 2020; Ng & Rahayu 2021; Fahimi *et al.* 2021; Takeda 2024).

The western Atlantic represents a major center of diversity for *Pilumnus* (Melo 1996; Moraes *et al.* 2015; Magalhães *et al.* 2021). In a phylogenetic study of western Atlantic *Pilumnus*, Oliveira-Rogeri *et al.* (2025) recognized nineteen previously named species of the genus, in addition to an undescribed species in the collections of the Muséum national d'Histoire naturelle (MNHN): originating from Guadeloupe, it was consistently separated from these species in molecular analyses.

Guadeloupe, the native locality of the specimen, is part of the complex of islands comprising the Lesser Antilles (Fig. 1), located between the open western Atlantic Ocean and that confined to the Caribbean Sea. This region is recognized as a biodiversity hotspot, particularly for marine crabs (Carmona-Suárez & Poupin 2016). Poupin (2018) reported 1029 species of marine decapod crustaceans in the Lesser Antilles, a diversity comparable to more extensively studied Gulf of Mexico's 1007 species (Felder *et al.* 2009), an adjacent region of the western Atlantic. Although recent investigations have devoted attention to the Lesser Antilles, crab diversity in Guadeloupe and surrounding islands remains underexplored (Poupin *et al.* 2015; Carmona-Suárez & Poupin 2016; Poupin & Corbari 2016; Poupin 2018; Parasram *et al.* 2023). Poupin (2018) reports that the discovery rate of new species in the Lesser Antilles continues to increase steadily, particularly among deep-sea anomuran crabs and brachyuran crabs of the families Goneplacidae MacLeay, 1838, Panopeidae Ortmann, 1893, Pilumnidae Samouelle, 1819, and Pinnotheridae De Haan, 1833.

Seven species of *Pilumnus* are known with certainty from Guadeloupe, *Pilumnus caribaeus* Desbonne, *in* Desbonne & Schramm, 1867, *Pilumnus dasypodus* Kingsley, 1879, *Pilumnus gemmatus* Stimpson, 1860, *Pilumnus gracilipes* A. Milne-Edwards, 1880, *Pilumnus marshi* Rathbun, 1901, *Pilumnus reticulatus* Stimpson, 1860, and *Pilumnus sayi* Rathbun, 1897 (Melo 1996; Poupin 2018; Magalhães *et al.* 2021). *Pilumnus pannosus* Rathbun, 1896 was also previously recorded in Guadeloupe by Poupin (2018), however the specimen accessed by the author and therefore used as voucher to attest the presence of the species in that territory is the same one examined in the present study and designated as the holotype for the new species described here. Thus, *P. pannosus* no longer has valid registers of occurrence in Guadeloupe.

These species play a significant ecological role in coastal ecosystems (Melo 1996; Moraes *et al.* 2015). The morphological and adaptive diversity of the genus makes it a relevant model for evolutionary and biogeographic studies (Magalhães *et al.* 2021; Takeda 2024), especially in megadiverse yet undersampled regions such as the Lesser Antilles (Carmona-Suárez & Poupin 2016; Poupin 2018). The description of new species within this group not only expands understanding of its taxonomic radiation but also supports conservation efforts in biodiversity hotspots.

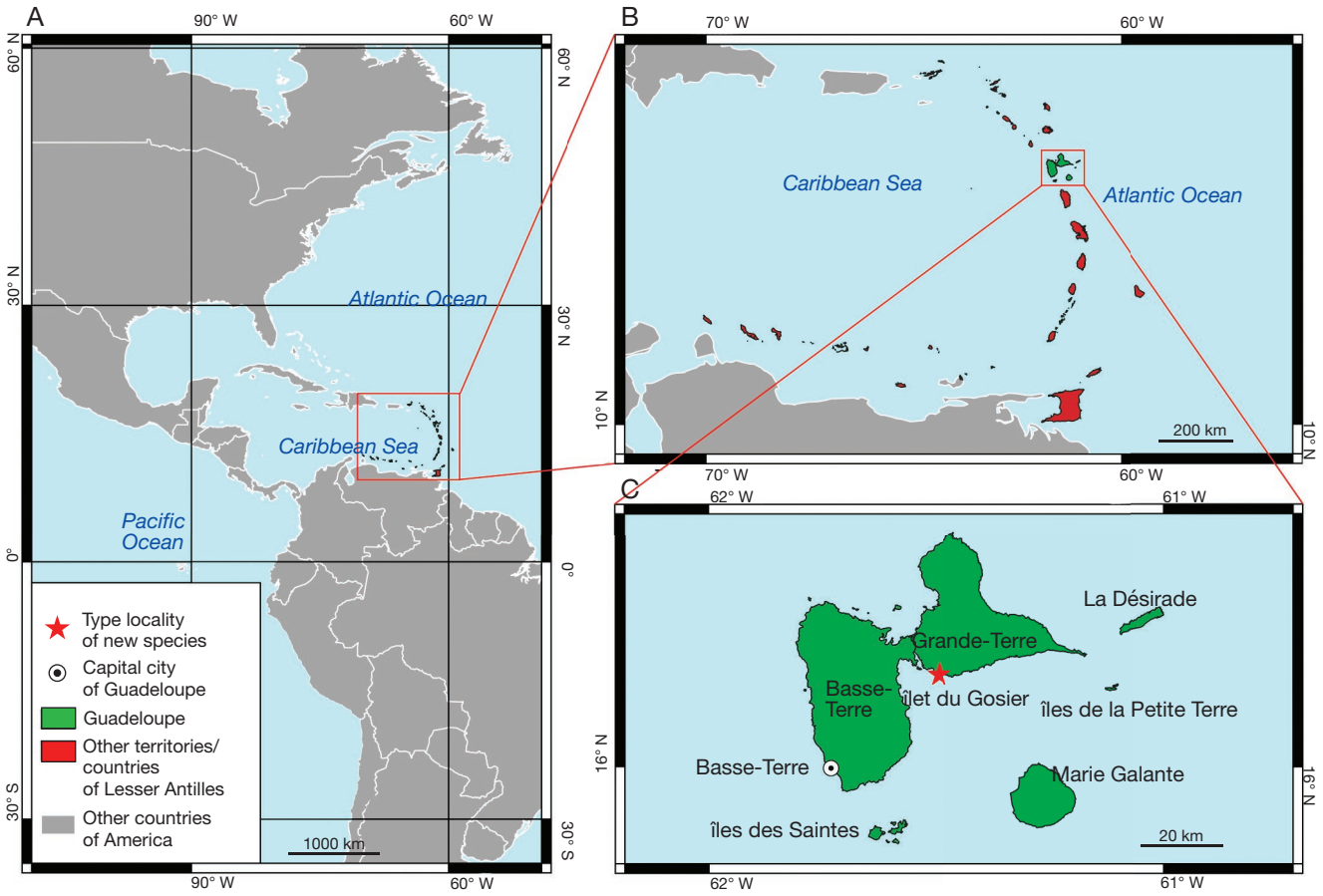

FIG. 1. — Locality map of Guadeloupe in the Caribbean region (**A**) and in the Lesser Antilles (**B**) showing Îlet du Gosier (**C**), collection site for *Pilumnus guadeloupensis* n. sp.

Given this taxonomic context, we conducted a detailed morphological analysis of the Guadeloupe specimen to assess whether it represented a new species. Our findings revealed morphological characters that differ considerably from those observed in currently described species. Morphology accompanied by strong molecular evidence in a companion paper (Oliveira-Rogeri *et al.* 2025) support the following description of a new species of *Pilumnus* from the western Atlantic.

MATERIAL AND METHODS

SPECIMEN DESIGNATION AND REPOSITORY

The holotype of the new species (male, carapace width = 6.44 mm, carapace length = 5.25 mm) is deposited in the Crustacean Collection of the Muséum national d'Histoire naturelle (MNHN-IU), Paris, France, under catalog number MNHN-IU-2013-16321. This specimen was collected during the KARUBENTHOS 2012 expedition, a collaborative effort between the MNHN, Parc National de la Guadeloupe, Université des Antilles et de la Guyane, and Université Pierre et Marie Curie. The expedition focused on expanding knowledge of marine diversity in Guadeloupe (Carmona-Suárez & Poupin 2016, 2018), resulting in over 1,630 catalogued lots and nearly 300 identified species by 2018.

COLLECTION DETAILS AND TYPE LOCALITY

The holotype was collected on Îlet du Gosier (16°12'5.4612"N, 61°29'42.36"W), a very small islet 0.6 km off south of Grande-Terre, Guadeloupe (department of France), here designated as the type locality (Fig. 1). The specimen was provided to us on loan by Laure Corbari, Paula Martin-Lefevre, and Noémy Mollaret from MNHN. Additional material from the same loan was used for morphological comparisons, in addition to those based on literature analyses.

MORPHOLOGICAL COMPARISONS

To ensure taxonomic accuracy, congeneric specimens deposited in other biological collections were also examined through loans or photographs taken by Joseph Poupin and made available on the CRUSTA project webpage (http://crustiesfroverseas.free.fr), a valuable online database with photographic documentation of several marine decapod species maintained by French Navy School, Institut de Recherche de l'École navale (IRENAV) (Le Gall & Poupin Internet – CRUSTA).

TABLE 1. — List of species used for morphological comparison with the voucher numbers and localities of the specimens accessed. Symbols and abbreviations used: ♂, male specimen; ♀, female specimen; *, holotype; **CW**, carapace width.

Species		**Type locality of species**
Specimens accessed	**Voucher**	**Locality of accessed specimen**
Pilumnus caribaeus Desbonne, *in* Desbonne & Schramm, 1867		Basse-Terre, Guadeloupe
1 ♂ (CW = 26.0 mm)	MNHN-IU-2000-18828	Moule, Grande-Terre, Guadeloupe
1 ♀ (CW = 21.8 mm)	ULLZ 11062	Twin Cays, Stann Creek, Belize
1 ♂ (CW = 14.58 mm)	CCDB 3615	Ubatuba, São Paulo, Brazil
Pilumnus dasypodus Kingsley, 1879		Key West, Florida, United States
1 ♀ (CW = 7.84 mm)	ULLZ 4346	British Virgin Islands
1 ♂ (CW = 12.04 mm)	USNM 1277893	Twin Cays, Stann Creek, Belize
Pilumnus floridanus Stimpson, 1871		Key West, Florida, United States
1 ♂ (CW = 8.34 mm)	ULLZ 1713	Campeche, Mexico
1 ♀ (CW = 9.68 mm)	CCDB 5919	Ilha de Búzios, São Paulo, Brazil
Pilumnus gemmatus Stimpson, 1860		St. Thomas, U.S. Virgin Islands
1 ♂ (CW = 10.04 mm)	MCZ 12143	Dry Tortugas, Florida, United States
Pilumnus lacteus Stimpson, 1871		Cayo Cruz del Padre, Cuba/Key West, Florida, United States
1 ♂ (CW = 6.62 mm)	ULLZ 9025	Fort Pierce, Florida, United States
1 ♂ (CW = 8.4 mm)	MCZ 2461	Bache Shoal, Florida, United States
1 ♂ (CW = 5.04 mm)	ULLZ 15465	Wee Wee Caye, Stann Creek, Belize
Pilumnus marshi Rathbun, 1901		St. Thomas, U.S. Virgin Islands
1 ♂ (CW = 5.65 mm) *	USNM 23771	U.S. Virgin Islands
1 ♂ (CW = 6.43 mm)	ULLZ 12564	Twin Cays, Stann Creek, Belize
Pilumnus pannosus Rathbun, 1896		Key West, Florida, United States
1 ♂ (CW = 12.0 mm) *	USNM 13814	Key West, Florida, United States
1 ♂ (CW = 14.52 mm)	ULLZ 8637	Panama City, Florida, United States
Pilumnus reticulatus Stimpson, 1860		St. Thomas, U.S. Virgin Islands
1 ♂ (CW = 7.09 mm) *	MNHN-IU-2000-4325	St. Thomas, U.S. Virgin Islands
1 ♂ (CW = 11.5 mm)	CCDB 5391	Ubatuba, São Paulo, Brazil
Pilumnus sayi Rathbun, 1897		Georgia/Florida, United States
1 ♂ (CW = 13.44 mm)	MCZ 9160	U.S. Virgin Islands

In addition to MNHN-IU, collections from which specimens were accessed included: CCDB – Coleção de Crustáceos do Departamento de Biologia from the Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto (FFCLRP), Universidade de São Paulo (USP), Ribeirão Preto, Brazil; Museum of Comparative Biology, Harvard University, Boston, United States (MCZ); Invertebrate Zoology Collection of the National Museum of Natural History – Smithsonian Institution, Washington, United States (USNM); University of Louisiana at Lafayette Zoological Collection (currently incorporated to USNM), Lafayette, United States (ULLZ). Comparisons included the seven species of *Pilumnus* known to occur in Guadeloupe in addition to *P. lacteus*, the genetically closest congener of the new species, and *P. pannosus*, species whose morphology closely resembles that of the new species (Table 1).

Analytical methods

Morphological observations were conducted using a Leica® M205C stereomicroscope, with special attention to diagnostic characteristics (e.g., carapace anterolateral projections, cheliped pubescence and tubercles, and ambulatory leg pubescence and tubercles). Except for the penis, all other taxonomically informative structures were examined. Measurements were taken with Starrett® 799 digital caliper (+ 0.01 mm). Species were compared to published descriptions spanning different periods of time (e.g., 1800s, 1900, 2000s) and by taxonomists and research groups (e.g., from America, Asia, Europe) in order to create a more universally applicable description (Stimpson 1860, 1871; A. Milne-Edwards 1880; Rathbun 1896, 1930; Forest & Guinot 1961; Naderloo & Ng 2011; Komai & Motoh 2012; Magalhães & Felder 2019; Fahimi *et al.* 2021; Ng & Rahayu 2021; Takeda 2024). Terminology follows Guinot & Bouchard (1998) and Davie *et al.* (2015) for general Brachyura morphology.

Documentation and abbreviation

Morphological features of the preserved holotype specimen were documented by high-resolution photographs (Leica® DFC 295 camera with Leica Application Suite v. 3.8.0 and Adobe Photoshop®), and detailed line illustrations (Adobe Illustrator®).

Abbreviations

CL carapace length;
CW carapace width;
G1 first gonopod;
mm millimeters.

Institutions

CCDB Coleção de Crustáceos do Departamento de Biologia from the Faculdade de Filosofia, Ciências e Letras de Ribeirão Preto (FFCLRP), Universidade de São Paulo (USP), Ribeirão Preto;

MNHN	Muséum national d'Histoire naturelle, Paris,
ULLZ	University of Louisiana at Lafayette Zoological Collection (currently incorporated to USNM), Lafayette;
USNM	Invertebrate Zoology Collection of the National Museum of Natural History – Smithsonian Institution, Washington;
MCZ	Museum of Comparative Biology, Harvard University, Boston.

RESULTS

Phylum ARTHROPODA Latreille, 1829
Class MALACOSTRACA Latreille, 1802
Order DECAPODA Latreille, 1802
Infraorder BRACHYURA Latreille, 1802
Family PILUMNIDAE Samouelle, 1819
Genus *Pilumnus* Leach, 1816

Pilumnus guadeloupensis n. sp.
(Figs 2-4)

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Pilumnus pannosus – Poupin 2018: 204 (Guadeloupe, 1 ♂; MNHN-IU-2013-16321, holotype specimen of *P. guadeloupensis*), not *P. pannosus* Rathbun, 1896.

Pilumnus aff. *lacteus* – Oliveira-Rogeri *et al.* 2025: 235.

TYPE MATERIAL. — **Holotype**. **Guadeloupe** • 1 ♂ (CW = 6.44 mm, CL = 5.25 mm); Grande-Terre, îlet du Gosier; KARUBENTHOS 2012; st. GD52; 6 m b.s.l.; 16°12'5.46"N, 61°29'42.36"W; 23.V.2012; MNHN-IU-2013-16321.

MOLECULAR SEQUENCES. — MF504071(16S), MF504144(COI).

TYPE LOCALITY. — The type locality of the species is îlet du Gosier, Guadeloupe, and this is the only recorded occurrence of the species.

ETYMOLOGY. — The specific epithet *guadeloupensis* refers to Guadeloupe, the type locality of the species, and it is used here as an adjective.

DIAGNOSIS. — Carapace anterodorsally with short pubescence; frontal, protogastric, and hepatic regions of dorsal surface with strong tubercules; supraorbital margins strongly toothed; anterolateral margin with four teeth, anteriormost of which formed by outer orbital tooth. Major chela palm with outer surface nearly smooth and glabrous. Ambulatory pereopods with merus dorsal margin mostly smooth, single subdistal denticle on dorsal margin of meri of pereopods 2-4; carpi and propodi with prominent spiniform tubercles.

DESCRIPTION

Carapace subhexagonal (Fig. 2A), anterior and posterior regions both sloped downwards, dorsum longitudinally arched; dorsal surface with short clavate setae on most surfaces (Fig. 3B, C), dense cover concealing surfaces anteriorly; anterior dorsal surface areolate, frontal regions (Fig. 3B) each with one raised tubercle, protogastric regions each with two closely adjacent raised tubercles in short transverse row; two well-separated tubercles positioned approximately along the cervical depression posterolaterally to the protogastric region; hepatic regions each bearing one broadly shouldered, strong, raised tubercle; posterior carapace smooth (Figs 2A; 3A; 4A). Front quadrilobed, with two wide, convex, and advanced mesial lobes, each with row of marginal setae, separated by deep median V-shaped depression, and two narrow, tooth-like, lateral lobes less advanced and separated by deep sinuse from mesial lobes (Fig. 3A, B). Orbits wide, supraorbital margin with strong inner orbital tooth separated mesially by deep sinus from lateral lobe of front, two blunt subtriangular teeth along transverse margin, and strong tooth at outer orbital angle (forming first anterolateral tooth); suborbital margin with four tubercles. Subhepatic region with single, short spiniform tooth, visible dorsally between first and second anterolateral teeth; pterygostomial region smooth, fringed with setae (Fig. 3D). Anterolateral margin with four acute teeth, corneous tips curved forward, anteriormost tooth formed by outer orbital tooth; inter-dental regions setose (Fig. 3C). Third maxilliped in external view (Figs 2B; 3E; 4B) with ischium subrectangular, distomesial margin forming strong right angle, mesial margin lined with small spinules and setal fringe of varied length; merus length half that of ischium, mesial margin with several long setae, with spinulose projection just proximal to merus-carpus junction; distal margin remarkably granulose, granulation extending into subdistal field; palp setose, especially propodus and dactylus; dactylus with setae exceeding article length; exopod length subequal to endopod. Chelipeds heterochelous (Fig. 2A), dense setae on outer surface of carpus and dorsal margin of propodus, setation varied in type and size, most regions covered by short plumose setae with few long simple or plumose setae present among them. Major cheliped (Figs 2A; 3F; 4A) merus with two prominent spiniform tubercles on dorsal margin; carpus outer/dorsal surface with 16 tubercles, inner margin crest below corner of article with three short spinules along edge above which is strong distal spine at inner margin corner; propodus inner and outer surfaces nearly smooth, superior margin with nine tubercles disposed in two rows; dactyl darkly pigmented, coloration not extending to palm (Figs 3H; 4C). Minor cheliped morphology similar to major cheliped but presenting more spiny tubercles and setae on outer upper surface of propodus (Fig. 3G). Ambulatory leg (pereopods 2-5) (Figs 2A; 3I; 4A) meri dorsally smooth except for single subdistal tubercle on dorsal margin and scattered setae, setae most conspicuous on ventral margin. Carpi and propodi with six or seven spiniform tubercles on dorsal margin, arranged in two longitudinal rows; dorsal setae short and plumose, lateral to ventral setae long and stiff. Dactyli lacking tubercles, ending in hooked corneous tip and scattered stiff setae; dactylo-propodal locking system present and formed by a projection on propodus distal margin, and a complementary notch on dactyl proximal margin. Thoracic sternum with sternites 1 and 2 completely fused, separated from sternite 3 by deep suture; sternites 3 and 4 faintly separated, with stiff setae; sternite 5 separated both from sternite 4 and sternite 6 by shallow sutures; sternites 6 and 7 separated by deep suture; sternite 8 not visible when pleon is closed and separated by a shallow sinus from ster-

Fig. 2. — Habitus of alcohol-preserved holotype of *Pilumnus guadeloupensis* n. sp., male (CW = 6.44 mm), MNHN-IU-2013-16321: **A**, dorsal; **B**, ventral. Scale bar: 2 mm.

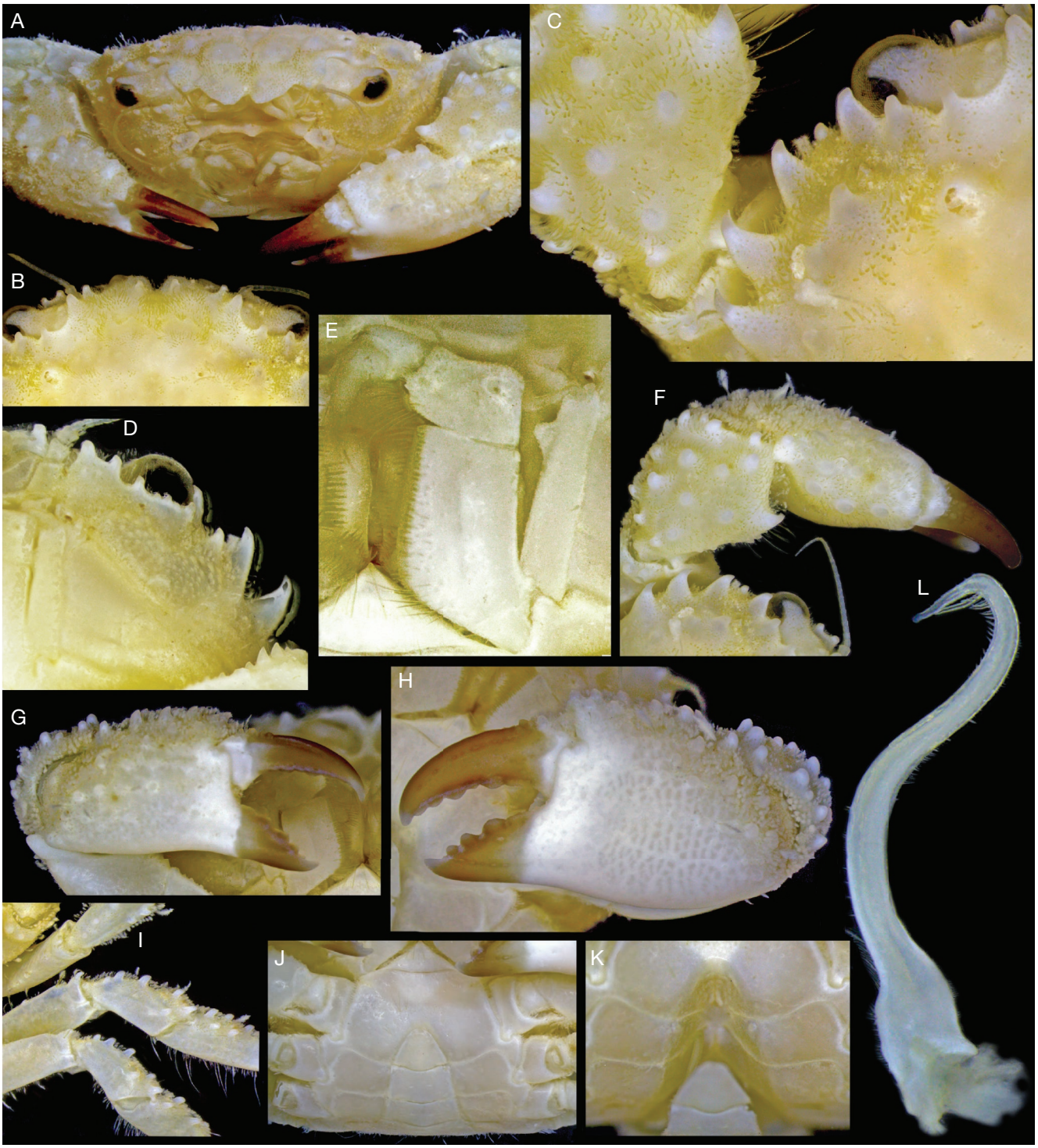

Fig. 3.— Alcohol-preserved holotype of *Pilumnus guadeloupensis* n. sp., male (CW = 6.44 mm), MNHN-IU-2013-16321: **A**, habitus, frontal; **B**, carapace front, dorsal; **C**, left anterolateral carapace margin, dorsal; **D**, left suborbital and pterygostomial carapace regions, ventral; **E**, left third maxilliped, external; **F**, left (major) cheliped, dorsal; **G**, right (minor) chela, external; **H**, left (major) chela, external; **I**, right pereopods 4 and 5, meri, carpi, and propodi, dorsal; **J**, anterior sternites and pereopod coxae, ventral; **K**, sternopleonal cavity with pleonal lock button; **L**, left first gonopod, mesial. Not to scale.

nite 7; sternites 1-3 and anterior portion of sternite 4 rough, posterior sternites smooth; median longitudinal suture of thoracic sternum not visible in sternites 1-3 and anterior portion of sternite 4, but visible in parts of sternites inside sternopleonal cavity, such as the posterior portion of sternite 4, and sternites 5 and 6. Within sternopleonal cavity, sternite 5 with well developed tubercle of pleonal locking mechanism, posteriorly located, near the suture between sternites 5 and 6 (Figs 2B; 3J-K). Pleon triangular, 6-segmented with no fused somites; all pleonites wider than

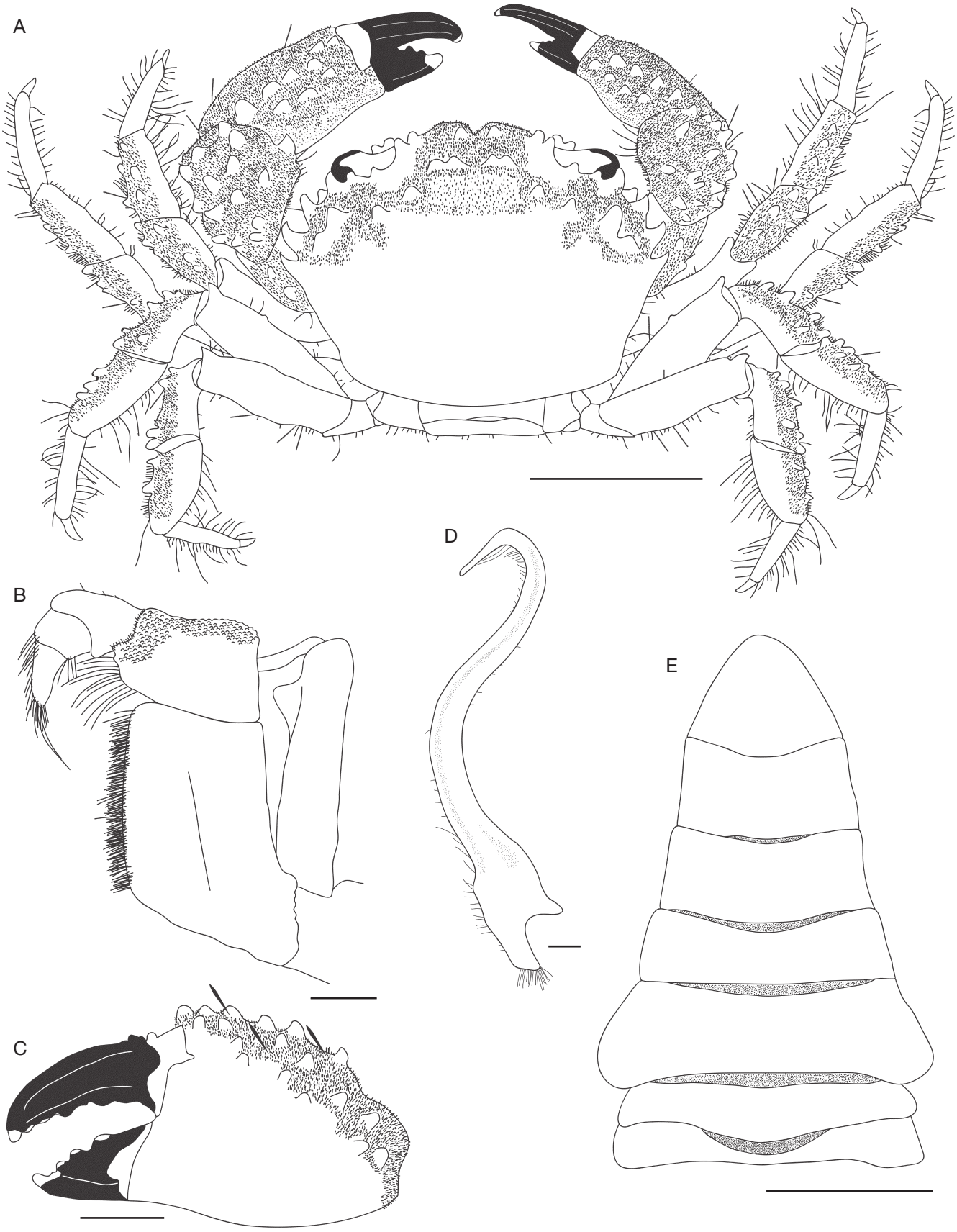

FIG. 4. — Holotype of *Pilumnus guadeloupensis* n. sp., male (CW = 6.44 mm), MNHN-IU-2013-16321: **A**, entire specimen on dorsal view; **B**, left third maxilliped, external; **C**, outer surface of major chela; **D**, left first gonopod, mesial; **E**, pleon and telson. Scale bars (mm): A, 3 mm; B, 0.7 mm; C, 2.5 mm; D, 0.2 mm; E, 1.5 mm.

long, trapezoidal, with most anterior more subrectangular and most posterior more subquadrate; pleonite 3 widest. Telson subtriangular, length to width ratio of 0.73; length subequal to pleonite 6 (Fig. 4E). First gonopod elongate, sinuous, proximal third slightly curved, distal third sharply hooked; apex downturned; stiff and simple setae evenly distributed, increasing gradually in length distally along sternal margin (Figs 3L; 4D). Second gonopod short, narrowing distally, except in the distalmost portion, which is wider, curved and flattened.

DISCUSSION

Morphological comparison

Pilumnus guadeloupensis n. sp. shares much morphological similarity with other members of the genus *Pilumnus*, yet is distinguished from its congeners by a suite of taxonomically informative traits. Morphologically most similar to *P. pannosus*, *P. guadeloupensis* n. sp. can be distinguished from that species most readily by its much less strongly developed ornamentation of the ambulatory pereopods. The meri of pereopods 2-4 are nearly smooth dorsally with only a small subdistal denticle (itself lacking in pereopod 5) in addition to a prominent distal tubercle in *P. guadeloupensis* n. sp. (Figs 2A; 3I). By contrast, multiple denticles are evident dorsally on the pereopod meri in *P. pannosus.* Additionally, the carpi and propodi of the ambulatory pereopods in *P. guadeloupensis* n. sp. are armed by six or seven spiniform tubercles arranged in longitudinal rows (Figs 2A; 3I) while much weaker tuberculation is found in *P. pannosus.*

Despite its molecular phylogenetic proximity to *P. lacteus* (Oliveira-Rogeri *et al.* 2025), *P. guadeloupensis* n. sp. is even more distinct morphologically from this species than it is from *P. pannosus*. While a well-developed pair of tubercles are present on the supraorbital margin of *P. guadeloupensis* n. sp. (Figs 2A; 3B), they are entirely absent in *P. lacteus*, its having a relatively smooth, granulated supraorbital margin.

Another phylogenetically closely related congener to *P. guadeloupensis* n. sp. is *P. reticulatus*. The most remarkable morphological difference between these two species is the shape of the front. *Pilumnus guadeloupensis* n. sp. has a notably quadrilobed front, with lateral lobes narrow, tooth-like, and separated by a deep sinus from mesial lobes (Fig. 3A, B). In contrast, *P. reticulatus* has a front with general bilobed aspect, with both lobes having only a shallow sinus in their medial portion.

Among other species recorded in Guadeloupe, *P. guadeloupensis* n. sp. is readily distinguished from several by its four forward-curved anterolateral teeth or spines (Fig. 3C), contrasting with the five spines of *P. caribaeus* and three spines of *P. marshi.* Its subhexagonal carapace further differentiates it from the subquadrate carapace of *P. marshi*. While it shares four anterolateral spines with *P. gemmatus*, which also presents four projections in this region, the first is notably a rounded, sometimes roughened and rounded, tooth, differing from that of the new species which is an acute tooth.

Within the broader western Atlantic region, *P. guadeloupensis* n. sp. is differentiated by the spiniform tubercles on the carpi and propodi of its ambulatory legs (5-7 spiniform tubercles in longitudinal rows) (Figs 2A; 3I) contrasting with the spines of *P. dasypodus* and *P. sayi*. The smooth outer surface of the major cheliped palm of *P. guadeloupensis* n. sp. (Fig. 3H) further distinguishes it from *P. mantelattoi*, which exhibits granular texture in this region.

It is worthwhile to mention that the morphology of first gonopod 1, which is widely considered a taxonomically informative feature, used for the species identification within different groups of marine brachyurans, such as pinnotherids, portunids and xanthids, is not a relevant characteristic for the distinction of western Atlantic species of *Pilumnus* (Manning & Felder 1989; Lai *et al.* 2011; Koch *et al.* 2023; Balbino *et al.* 2025). On the other hand, traditional morphological characters, such as the number of anterolateral projections and the ornamentation of chelipeds and ambulatory legs, seem to be relevant to species identification within *Pilumnus*.

Given that morphology is thus far known for only one specimen of *P. guadeloupensis* n. sp., further morphological comparisons are deferred, pending additional collections that permit a more robust understanding of potential variations in our new species. We thus limit present comparisons to what we regard as only the most conspicuous of characters. This underscores the importance of building further collections to delineate cryptic diversity within *Pilumnus* but also highlights the relevance of integrating morphology and genetics in such efforts.

Phylogenetic hypothesis built with molecular data in Oliveira-Rogeri *et al.* (2025) positioned this specimen close to a specimen of *Pilumnus lacteus* Stimpson, 1871, but genetic distance for the gene cytochrome oxidase subunit I (COI) between these specimens (3.9%) was higher than typical of intraspecific variation in the study. Molecular genetic analyses also support the separation between *P. pannosus* and *P. guadeloupensis* n. sp., although they present a notable similar morphology. The divergence for COI registered between these species is 6.7% (Oliveira-Rogeri *et al.* 2025). Both abovementioned values of divergence for COI are higher than the 2% suggested by Oliveira-Biener *et al.* (2010) as a key value to justify the distinction of two lineages as species within *Pilumnus*. It is worthwhile to highlight that the recognition of *P. guadeloupensis* n. sp. [previously referred to as *Pilumnus* aff. *lacteus* in Oliveira-Rogeri *et al.* (2025)], *P. lacteus* and *P. pannosus* as three different taxonomic entities was attested by different species delimitation methods (Oliveira-Rogeri *et al.* 2025).

Following the molecular genetic findings with a detailed study of morphology, we were able to subsequently find discrete morphological differences that further justified the recognition of *P. guadeloupensis* n. sp., even though it was represented by only the holotype. Field expeditions like KARUBENTHOS 2012 remain indispensable for uncovering neotropical biodiversity, particularly in understudied hotspots such as the Lesser Antilles, where even well-sampled groups like *Pilumnus* continue to yield novel taxa.

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The present study is part of a collective effort to decipher the decapod diversity along the western Atlantic coast, and especially in poorly investigated areas already recognized as hotspots of marine diversity, such as the Lesser Antilles. Findings provided by this study and some previous ones evince the importance of systematic field expeditions, such as KARUBENTHOS 2012, and of collaboration between conservation units, museums and different research institutions in order to achieve the greater objective of understanding the biodiversity existing on our planet and the associated patterns and processes. The KARUBENTHOS expedition was a joint project of Muséum national d'Histoire naturelle (MNHN; Principal Investigator: Philippe Bouchet), the National Park of Guadeloupe, Université des Antilles et de la Guyane (UAG), and Université Pierre et Marie Curie (UPMC), with funding from Fonds européen de Développement régional (FEDER) and Port Autonome de la Guadeloupe.

It took place in May 2012 and explored the near-shore small macrobenthos (molluscs, crustaceans, echinoderms, algae) of Guadeloupe, at depths between 0 and 50 meters – with occasional light dredging to 130 meters. It involved 35 participants, including citizen scientists, interns, collection managers and researchers from 7 countries. A follow-up campaign took place at another season in December 2012.

A total of 302 sampling events took place - intertidally, by diving and by trapping and dredging. For lists of stations, resulting publications and other documents on the expedition, see http://expeditions.mnhn.fr/campaign/karubenthos2012. Specimens examined in this study are part of loans kindly provided by Laure Corbari, Paula Martin-Lefevre and Noémy Mollaret from the Muséum national d'Histoire naturelle, in Paris, Karen Reed and Rafael Lemaitre from the United States National Museum, in Washington, and Adam Baldinger from the Museum of Comparative Zoology, in Boston, to whom we express our deepest gratitude. We also thank the anonymous reviewers for their valuable comments, which improved the quality of the manuscript.

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