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THE PORCELLANID CRABS OF THE ISLA GORGONA, PACIFIC COAST OF COLOMBIA, WITH A DESCRIPTION OF *CLASTOTOECHUS GORGONENSIS* SP. NOV. (CRUSTACEA: ANOMURA)

By

BERND WERDING AND JANET HAIG

SUMMARY

A collection of porcellanid crabs was made on the Isla Gorgona, Colombia, during a one week period, sampling as completely as possible a number of different biotopes. The majority of the 16 species in six genera that were collected occurred in the formations of pocilloporid corals and between stones in the sublittoral zone.

Clastotoechus gorgonensis sp. nov. lives in the burrows of the sea urchin *Echinometra vanbrunti* A. Agassiz in the intertidal zone. Seven species are new additions to the porcellanid fauna of Gorgona and two of them are new records for Colombia. A total of 18 species are now known to occur on Isla Gorgona.

RESUMEN

En un trabajo de campo de una semana en la Isla Gorgona, Colombia, se colecionaron porcelánidos en una variedad de diferentes biotopos. La mayoría de las 16 especies, pertenecientes a seis géneros que se reportan, se encontraron en las formaciones de corales del género *Pocillopora* y entre piedras en la zona sublitoral.

Clastotoechus gorgonensis sp. nov. vive en los huecos que perforan erizos de la especie *Echinometra vanbrunti* A. Agassiz en las rocas del intermareal. Siete especies son nuevas adiciones a la fauna de porcelánidos de Gorgona, y dos de éstas son nuevos reportes para Colombia. Con este trabajo el número total de especies de porcelánidos reportados de la Isla Gorgona se aumenta a 18.

INTRODUCTION

Dealing with the porcellanid crabs of the eastern Pacific, HAIG (1960) reports 10 species to occur in the vicinity of Isla Gorgona, Colombia. Since then, no additional findings have been reported from this small island.

As a result of the present study 18 species of porcellanid crabs are now known to occur in the waters surrounding Gorgona. From this number, *Clastotoechus gorgonensis* sp. nov. is only known to occur in

Gorgona and from one former finding from Bahía Piñas, Panamá. *Neopisosoma dohenyi* HAIG, 1960 and *Polyonyx nitidus* Lockington were not known formely from the Colombian Pacific and *Petrolisthes agassizii* FAXON, *P. artifrons* HAIG, *P. hians* NOBILI, and *P. tridentatus* STIMPSON, as well as *Pisidia magdalenensis* (GLASSELL), are new additions to the fauna of Isla Gorgona. Only *Pachycheles crassus* (A. MILNE EDWARDS), and *Petrolisthes armatus* (GIBBES), previously reported from Gorgona (HAIG 1960), are not included in the material collected herein.

DESCRIPTION OF THE AREA

Isla Gorgona is a small island located in front of Guapi (Colombia) at a distance of 56 km from the mainland, at 2° 58′ north latitude and 78° 11′ west longitude. The island has an extention of 11 km from north to south and 2-3 km aprox. from east to west. To the southwest of the island, there is a smaller island, Gorgonilla, which is separated from the main island by a shallow channel and which may be reached by foot in low tides. A marked difference can be observed in the water conditions. The eastern side of the Island is relatively protected and covered by large areas of *Pocillopora* reefs, whereas the west side is generally exposed to heavy water movements, and coral growth is less abundant. A detailed description of the Island and its marine environments may be found in PRAHL *et al.* (1979) and GLYNN *et al.* (1980).

METHODS

During a one week field trip in May 1979 a variety of different stations were sampled by hand while skin and Scuba diving, or while wading in very shallow water. Collections were made from the intertidal zone to a depth of 15 m. The collection stations are shown in Fig. 1 and are characterized as follows:

Station 1: El Horno

Isolated rock, north of the island. Samples were taken from the intertidal sea urchin burrows and from under stones between 5 and 15 m.

Station 2: La Azufrada

Pocillopora bank at the eastern side of the Island. Samples were taken between the coral intersticea at a depth of 4 m and from superimposed boulders in the intertidal.

Station 3: Punta Sur

Southern point of Gorgona, with large boulders upon sand and gravel between the intertidal and 4 m in depth.

Station 4: Paso de Tasca

Coarse sediment bottom with isolated colonies of pocilloporid corals between 8 and 10 m in depth.

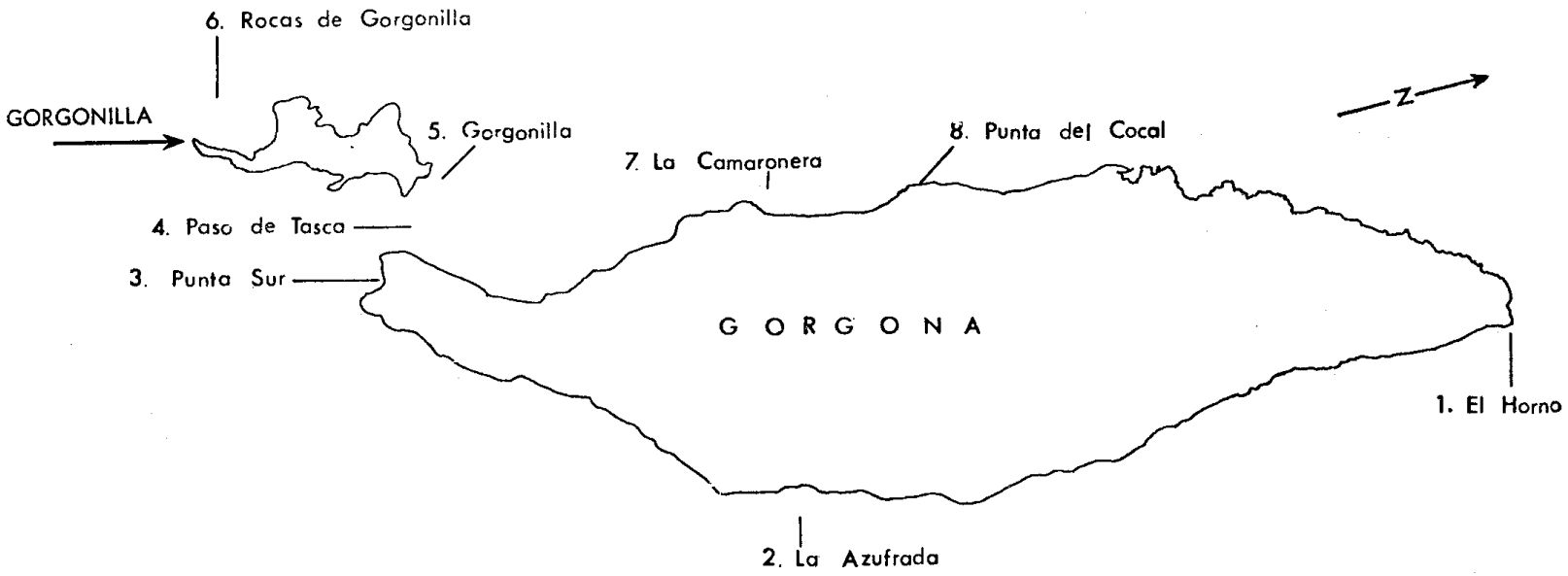

Figure 1. Map of Isla Gorgona indicating the sampling sites.

Station 5: Gorgonilla

Intertidal station on the northern point of Gorgonilla, with boulders upon rocky surfaces.

Station 6: Rocas de Gorgonilla

Rocky subtidal station SW of Gorgonilla with large colonies of pocilloporid corals upon rocky surface. Samples were taken from 2 to 12 m in depth.

Station 7: La Camaronera

Exposed isolated coral banks in front of a rocky shore at the west side of Gorgona. Samples were taken from pocilloporid corals from 4 to 6 m and from tide pools.

Station 8: Punta del Cocal

Heavily exposed rocky slope. Samples were taken from the *Echinometra* zone in the intertidal and from a boulder field upon coarse sediment at 15 m.

All specimens collected were mesured using a calibrated ocular micrometer on a stereo microscope. Measurements are given in millimeters, rounded off to the nearest tenth. Carapace length is followed by carapace width. The collection is deposited in the Instituto de Investigaciones Marinas de Punta de Betín (INVEMAR), Santa Marta. Type specimens are distributed as indicated in the collection of the Allan Hancock Foundation, University of Southern California (AHF), the Invertebrate Reference Museum, Smithsonian Institution, Ft. Piece Bureau (SIFP) and that of INVEMAR.

For synonymies, the monograph by HAIG (1960) may be consulted.

RESULTS

Family PORCELLANIDAE HAWORTH, 1825

Genus *Clastotoechus* HAIG, 1960

Clastotoechus gorgonensis sp. nov.

(Figs. 2, 3, 4, 5)

Type material:

Holotype: ♂ (5,0 x 5,2 mm), El Horno; INVEMAR.

Paratypes: El Horno, 1 ♀, INVEMAR; 1 ♂, 1 ♀ AHF 792. — Punta del Cocal, 1 ♂, 5 ♀ ♀, INVEMAR—. Bahía Piñas, Panamá, 07° 33. 5′ N, 78° 12′ W; 6-9 m; 10 september 1961; coll R/V "Argosy"; 2 ♂ ♂, 3 ♀ ♀ (ov), SIFP 89.4453.

Measurements: Largest ♂ 6,3 x 6,9 mm; largest ♀ 6,0 x 6,8 mm; smallest ovigerous ♀ 3,4 x 3,8 mm.

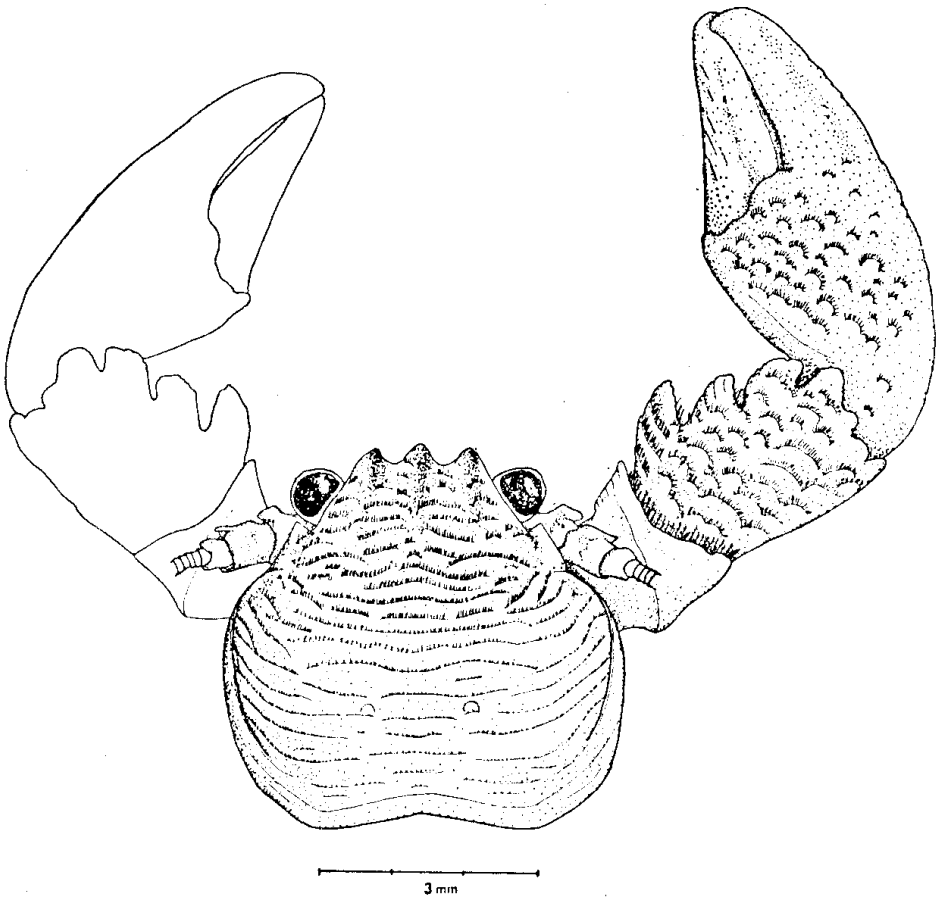

Figura 2. Maleholotype, dorsalview of *Clastotoechus gorgonensis* sp. nov.

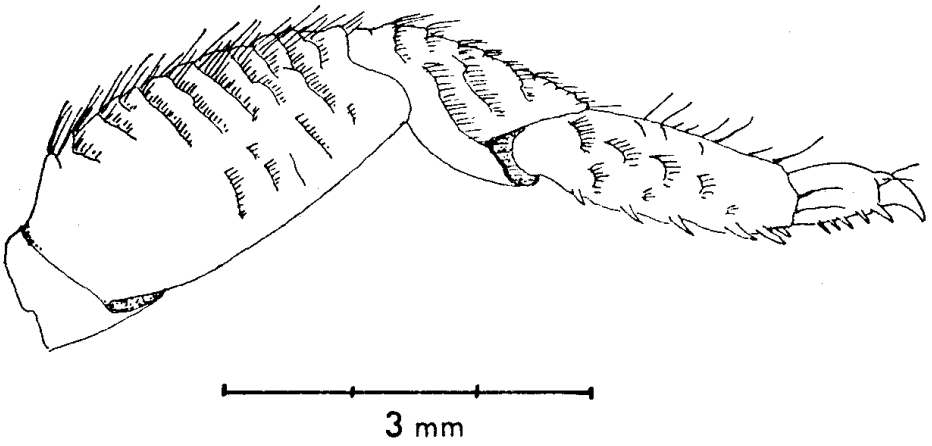

Figura 3. Right first walking leg of *Clastotoechus gorgonensis* sp. nov.

Description: Carapace slightly broader than long, covered with strong, tranverse rugae; these are broken up into shorter rugae in frontal area, where they are separated by deep median groove. Free (anterior) edge of rugae with minute granules and fringe of fine setae. Frontal region produced, with three subequal, triangular lobes, these separated from each other by deep, rounded notches; margins and surface of lobes with small, close-set granules. Orbital margin strongly oblique, straight or slightly convex; outer orbital angle produced into small tooth. Epimera incomplete, posterior portion consisting of many small fragments separated by narrow, membranous interspaces.

Basal segment of antennules with three strong lobes anteriorly. First movable segment of antennae with strong lobe on anterior margin; second with several lobiform tubercles on anterior margin; third more or less smooth; flagellum stout, minutely setose. Outer maxillipeds rugose.

Merus of chelipeds covered with flattened, imbricate tubercles; inner margin with small serrate-edged lobe. Carpus with longitudinal rows of large, flattened imbricate tubercles or smaller, more widely spaced tubercles; inner margin with four strong, crenulate-edged teeth, their surface rugose or with small imbricate tubercles, proximal tooth longest, distal tooth shortest and forming projection of anterodistal angle; posterodistal angle sometimes produced into short, curved spine. Palm and fingers tuberculate; outer margin of palm and given finger with row of short spines; fingers meeting for entire length or slightly gaping, gape with short (or sometimes obsolescent) pubescence at base. All tubercles of chelipeds with small rounded granules and fringe of setae along their free edge.

Merus of walking legs transversely rugose, carpus and propodus with several series of shorter rugae; all these rugae with beaded edges and fringe of fine setae; dactyl short and stout; ventral margin of propodus and dactyl with row of stout movable spinules; margins and dorsal surface of all segments with scattered long, coarse setae.

Telson five-plated.

Relationships: In the other eastern Pacific member of the genus, *Clastotoechus diffractus* (HAIG), the carapace has non-imbricate tubercles on the anterior half and fine, transverse rugae posteriorly; the frontal area is finely granulate and more strongly produced than in the new species. The carpus and chela of the chelipeds are tuberculate as in *C. gorgonensis*, but as a rule the tubercles are not imbricate and they are not margined with bead-like granules and a fringe of setae. There is a distinct median longitudinal ridge on the carpus; the palm has a longitudinal swelling on its dorsal surface, and frequently (usually in females only) there is a brush of fine setae along its outer margin. *C. diffractus* occurs from México south to Panamá and at Isla Malpelo, Colombia.

The other two species of the genus, *Clastotoechus nodosus* (STREETS) and *C. vanderhorsti* (SCHMITT), are inhabitants of the tropical western Atlantic. Both differ from the new species in having a tuberculate or granulate carapace without strong transverse rugae anteriorly, and in

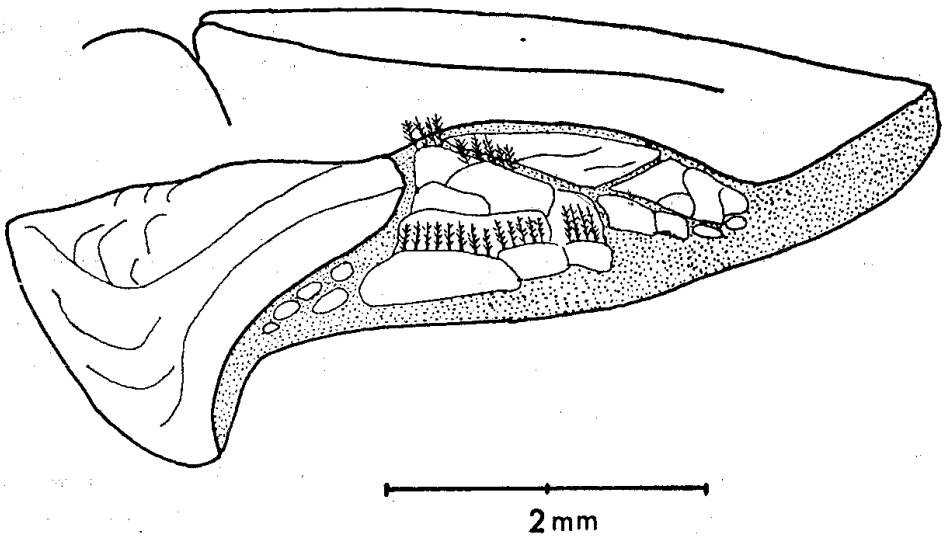

Figura 4. Carapace, side view of *Clastotoechus gorgonensis* sp. nov.

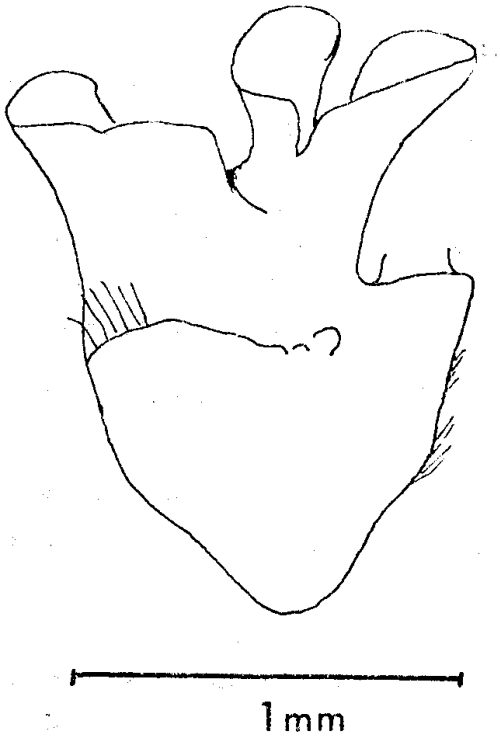

Figura 5. Right antennule, basal segment of *Clastotoechus gorgonensis* sp. nov.

possessing a brush of setae on the outer margin of the chela in both sexes; *C. vanderhorsti* further differs by its very strongly produced frontal region and frontal lobes.

Neither *Clastotoechus diffractus* nor *C. nodosus* is known to live in association with sea urchins. *C. vanderhorsti,* on the other hand, has frequently been reported from the burrows of *Echinometra,* a habit shared by the new species (see *Remarks,* below).

Remarks: This species could be found on Gorgona only in the holes occupied by the burrowing sea urchin *Echinometra vanbrunti* in the rocky intertidal. This finding corresponds with former findings of *Clastotoechus vanderhorsti,* in the Caribbean, which was reported to live together with *Echinometra lucunter* (LINNAEUS) in Barbados (LEWIS, 1960), Virgin Islands (MARKHAM, 1975) and in the vicinity of Santa Marta and Golfo de Urabá, Colombia (WERDING, 1977, 1978).

At the other side the specimens from the "Argosy" expedition were not found in association with *Echinometra.*

Because of the limited time and the heavy exposed situation where *C. gorgonensis* was found, it was impossible to observe the type of relationship which might exist between the crab and the sea-urchin.

Genus *Neopisosoma* HAIG, 1960

Neopisosoma dohenyi HAIG, 1960

Material examined:

4 ♂♂, 3 ♀♀ (ov), La Camaronera, 4-6 m, May 1979.

Measurements: Largest ♂ 3,5 x 4,7 mm; largest ♀ 4,5 x 6,0 mm; smallest ovigerous ♀ 2,7 x 3,1 mm.

Remarks: The specimens included herein had been sampled from the interstices of pocilloporid corals in a situation of heavy water movement.

The species was previously found only south to Bahía Piñas, Panamá.

The finding at Gorgona represents a range extent of more than 700 km to the south and is a new record for Colombia.

Distribution: Mouth of Golfo de California, México to Isla Gorgona, Colombia.

Genus *Pachycheles* STIMPSON, 1858

Pachycheles biocellatus (LOCKINGTON, 1878)

Material examined:

1 ♂, La Azufrada, 4 m, May 1979.

3 ♂♂, 5 ♀♀ (ov), La Camaronera, 4-6 m, May 1979.

2 ♂♂, 3 ♀♀ (ov), Punta del Cocal, 15 m, May 1979.

5 ♂♂, 2 ♀♀ (ov), Punta Sur, 3 m, May 1979.

15 ♂♂, 9 ♀♀ (7 ov), Rocas de Gorgonilla, 8-12 m, May 1979.

Measurements: Largest ♂ 6,0 x 6,3 mm; largest ♀ 5,9 x 7,0 mm; smallest ovigerous ♀ 2,8 x 3,1 mm.

Remarks: This species, which is one of the most common porcellanid crabs to be found on Gorgona, had been sampled from coral interstices and under stones. The species has been reported from Gorgona before by HAIG (1957, 1960).

Distribution: Lower Golfo de California, México, to Isla La Plata, Ecuador; Revillagigedos; Clipperton; Malpelo; Gorgona; Galápagos.

Pachycheles crassus (A. MILNE EDWARDS, 1869)

Reported from Isla Gorgona (HAIG, 1957). Not included in present collection.

Pachycheles vicarius NOBILI, 1901

Material examined:

5 ♂♂, 1 ♀ (ov), La Camaronera, 4-6 m, May 1979.

2 ♂♂, 1 ♀ (ov), Punta del Cocal, 15 m, May 1979.

Measurements: Largest ♂ 4,9 x 5,6 mm; largest ♀ 5,0 x 6,1 mm; smallest ovigerous ♀ 2,9 x 3,7 mm.

Remarks: This species was found on the exposed west side of the island between corals and under stones. It has been reported from Gorgona before (HAIG, 1957).

Distribution: Acajutla, El Salvador, to Bahía Santa Elena, Ecuador; Gorgona.

Genus *Petrolisthes* STIMPSON, 1858

Petrolisthes agassizii FAXON, 1893

Material examined:

6 ♂♂, 5 ♀♀ (3 ov), La Camaronera, 4-6 m, May 1979.

1 ♂, Punta Sur, 2 m, May 1979.

Measurements: Largest ♂ 6,3 x 6,6 mm; largest ♀ 6,2 x 6,7 mm; smallest ovigerous ♀ 3,5 x 3,7 mm.

Remarks: The specimens were sampled in interstices of *Pocillopora* corals. It was formerly found only in Bahía Utría, Colombian Pacific coast, and represents a new record for Gorgona.

Distribution: Mouth of Golfo de California, México, to Isla Gorgona, Colombia.

Petrolisthes armatus (GIBBES, 1850)

Reported from Isla Gorgona (HAIG, 1960). Not included in present collection.

Petrolisthes artifrons HAIG, 1960

Material examined:

6 ♂♂, 3 ♀♀ (2 ov), La Camaronera, 4-5 m, May 1979.

Measurements: Largest ♂ 4,4 x 4,4 mm; largest ♀ 3,6 x 4,0 mm; smallest ovigerous ♀ 3,6 x 3,9 mm.

Remarks: This species was found only in the coral interstices on the exposed side of the island. It has been found before in some places of the Colombian Pacific, but not in Gorgona.

Distribution: Port Parker, Costa Rica, to Punta Santa Elena, Ecuador.

Petrolisthes edwardsii (SAUSSURE, 1853)

Material examined:

5 ♂♂, 6 ♀♀ (3 ov), La Camaronera, 4-6 m, May 1979.

3 ♂♂, 4 ♀♀ (3 ov), Punta del Cocal, 15 m, May 1979.

6 ♂♂, 13 ♀♀ (10 ov), 1 juv., Punta Sur, 4 m, May 1979.

2 ♂♂, 2 ♀♀ (1 ov), El Horno, 15 m, May 1979.

1 ♂, 4 ♀♀, 1 juv., Rocas Gorgonilla, 8-12 m, May 1979.

Measurements: Largest ♂ 11,0 x 11,8 mm; largest ♀ 11,1 x 12,0 mm; smallest ovigerous ♀ 5,3 x 5,3 mm.

Remarks: This species was found nearly in all places visited, under stones and in coral interstices in depths between 4 and 15 m, but not in shallow water coral formations. It has been reported from Gorgona before by HAIG (1957, 1960).

Distribution: Outer Baja California and upper Golfo de California, México, to Isla La Plata, Ecuador; Revillagigedo and Galápagos.

Petrolisthes glasselli HAIG, 1957

Material examined:

10 ♂♂, 12 ♀♀ (6 ov), La Azufrada, 4 m, May 1979.

1 ♂, 1 ♀ (ov), Punta Sur, 4 m, May 1979.

2 ♀♀ (1 ov), El Horno, 12 m, May 1979.

1 ♂, 2 ♀♀, Rocas Gorgonilla, 8-12 m, May 1979.

Measurements: Largest ♂ 7,0 x 6,7 mm; largest ♀ 8,7 x 8,6 mm; smallest ovigerous ♀ 5,5 x 5,4 mm.

Remarks: This species was always found in the interstices of living pocilloporid corals and seems to be represented in almost all locations where this corals occur. This corresponds with the statement of HAIG (1960), which mentions the marked tendency of this species to live in association with corals. It was reported before at Gorgona (HAIG, 1957, 1960).

Distribution: Mouth of Golfo de California, México, to Isla Gorgona, Colombia; Revillagigedo; Clipperton; Malpelo; Galápagos.

Petrolisthes haigae CHACE, 1962

Material examined:

6 ♂♂, 6 ♀♀ (ov), La Camaronera, 4-6 m, May 1979.

3 ♂♂, 1 ♀ (ov), Punta del Cocal, 15 m, May 1979.

1 ♂, 8 ♀♀ (6 ov), Punta Sur, 4 m, May 1979.

2 ♂♂, 1 ♀ (ov), El Horno, 5-10 m, May 1979.

3 ♂♂, 8 ♀♀ (ov), Rocas Gorgonilla, 8-12 m, May 1979.

Measurements: Largest ♂ 8,0 x 8,3 mm; largest ♀ 10,8 x 11,0 mm; smallest ovigerous ♀ 4,1 x 4,1 mm.

Remarks: This species may be found between living corals as well as under stones and is common down to 15 m. It has been reported before from Gorgona by HAIG (1957, 1960) as *Petrolisthes marginatus*.

Distribution: Central Golfo de California, México, to Bahía Santa Elena, Ecuador; Revillagigedo; Clipperton; Malpelo; Gorgona; Galápagos.

Petrolisthes hians NOBILI, 1901

Material examined:

16 ♂♂, 11 ♀ (ov), La Camaronera, 4-6 m, May 1979.

1 ♂, Rocas Gorgonilla, 8-12 m, May 1979.

Measurements: Largest ♂ 3,6 x 4,0 mm; largest ♀ 3,7 x 4,0 mm; smallest ovigerous ♀ 2,6 x 2,8 mm.

Remarks: Found in the dead part of coral colonies. The species has been reported from Bahía Humboldt, Colombia (HAIG, 1960), but is new for Gorgona.

Distribution: Outer Baja California and central Golfo de California, México, to Bahía Santa Elena, Ecuador; Revillagigedo; Gorgona.

Petrolisthes nobilii HAIG, 1960

Material examined:

7 ♂♂, 2 ♀♀ (ov), La Azufrada, intertidal, May 1979.

1 ♀ (ov), Gorgonilla, intertidal, May 1979.

2 ♀♀ (ov), Punta del Cocal, 15 m, May 1979.

Measurements: Largest ♂ 10,3 x 10,3 mm; largest ♀ 8,2 x 8,7 mm; smallest ovigerous ♀ 4,8 x 5,0 mm.

Remarks: This species has its major representation between boulders in the intertidal. It has been reported from Gorgona (HAIG, 1960) and Gorgonilla (HAIG, 1968).

Distribution: Mouth Golfo de California, México, to Bahía Santa Elena, Ecuador; Gorgona.

Petrolisthes ortmanni NOBILI, 1901

Material examined:

3 ♂♂, 5 ♀♀ (3 ov), Punta del Cocal, 15 m, May 1979.

1 ♂, Rocas Gorgonilla, 2 m, May 1979.

Measurements: Largest ♂ 5,2 x 4,9 mm; largest ♀ 4,7 x 4,8 mm; smallest ovigerous ♀ 3,5 x 3,4 mm.

Remarks: The species has been found under stones in exposed situations. It has been reported from Gorgona before by HAIG (1957).

Distribution: Central Golfo de California, México, to Lobos de Afuera, Perú; Cocos; Gorgona.

Petrolisthes polymitus GLASSELL, 1937

Material examined:

1 ♂, 2 ♀♀ (1 ov), Paso de Tasca, 8-10 m, May 1979.

2 ♂♂, Punta del Cocal, 15 m, May 1979.

4 ♀♀ (ov), Punta Sur, 2 m, May 1979.

Measurements: Largest ♂ 4,2 x 4,2 mm; largest ♀ 4,1 x 4,3 mm; smallest ovigerous ♀ 2,8 x 2,8 mm.

Remarks: Found under stones and coral debris. The species has been reported from Gorgona before (HAIG, 1960).

Distribution: Lower Golfo de California, México, to La Libertad, Ecuador; Gorgona; Galápagos.

Petrolisthes tridentatus STIMPSON, 1859

Material examined:

4 ♂♂, 3 ♀♀ (2 ov), La Camaronera, tide pools, May 1979.
1 ♂, 1 ♀, Gorgonilla, intertidal, May 1979.

Measurements: Largest ♂ 4,5 x 4,5 mm; largest ♀ 4,6 x 4,7 mm; smallest ovigerous ♀ 3,5 x 3,5 mm.

Remarks: Tipical species of the intertidal zone where it occupies small interstices under stones. The species has been reported before from Bahía Limón and Golfo Cupica, in the Colombian Pacific (HAIG, 1960) and is a new record for Gorgona.

Distribution: The species is reported from the Caribbean as well as from the Western Pacific. Distribution in the Pacific: San Juan del Sur, Nicaragua, to Isla Puná, Ecuador; Gorgona.

Genus *Pisidia* LEACH, 1820

Pisidia magdalenensis (GLASSELL, 1936)

Material examined:

6 ♂♂, 6 ♀♀ (5 ov), Paso de Tasca, 8-10 m, May 1979.

Measurements: Largest ♂ 2,9 x 2,8 mm; largest ♀ 2,7 x 2,8 mm; smallest ovigerous ♀ 2,0 x 1,9 mm.

Remarks: Samples were taken from the dead parts of isolated *Pocillopora* colonies growing upon sedimentary bottom. The species has been reported before from Bahía Utría and Bahía Málaga on the Colombian Pacific coast (HAIG, 1960) and is a new record from Gorgona.

Distribution: Outer Baja California and mouth of Golfo de California, México, to vicinity of Tumbes, Perú; Gorgona.

Genus *Polyonix* STIMPSON, 1858

Polyonix nitidus LOCKINGTON, 1878

Material examined:

1 ♀ (ov), La Azufrada, 4 m, May 1979.

Measurements: Only specimen 2,4 x 3,2 mm.

Remarks: The only specimen was found on living branches of a *Pocillopora* colony. The finding from Gorgona represents an extension of range southward from Isla Taboga, Panamá.

Distribution: Upper Golfo de California, México, to Isla Gorgona, Colombia.

DISCUSSION

Althogh the present study tried to cover most of the accesible biotopes, it can not be considered complete. Specially the limitations in time and of the applied sampling methods did not allow the sampling of all locations intensively and excluded to a high degree the deeper parts of the subtidal zone. Therefore, the finding of additional species from deeper bottoms and of species that live as commensals is expected, if other methods were to be applied. Despite of the obvious limitations, the present collection has increased the known porcellanid fauna of Gorgona from 10 to 18 species and added one hitherto undescribed species.

It is hoped, that similar studies, carried out for other groups of marine organisms may demonstrate the very special situation of Isla Gorgona on the Colombian Pacific coast and may encourage activities which should conduct to a future conservation of its marine environements.

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Address of the authors:

B. WERDING
Zoologisches Institut der Univ. Giessen
Stephanstrasse 24, D-6300 Giessen
Alemania Federal

J. HAIG
Allan Hancock Foundation
University Park
Los Angeles, California 90007
U. S. A.