

# DECAPOD CRUSTACEANS INHABITING LIVE AND DEAD COLONIES OF THREE SPECIES OF *ACROPORA* IN THE ROQUES ARCHIPELAGO, VENEZUELA\*

by

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## SUMMARY

A systematic account is given of the decapod crustaceans found in live and dead colonies of three species of the scleractinian coral *Acropora* (*A. cervicornis*, *A. palmata*, *A. prolifera*), collected during a 9 month period in a shallow reef flat in the southwestern portion of the Archipelago Los Roques, Venezuela.

A total of 1900 individuals belonging to 30 species were found. Some qualitative observations on the ecology, feeding, and reproduction of some decapod species are given.

Most of the species collected were found in the dead portions of the colonies. The crab *Domestia acanthophora* seems to be the only true commensal that depends on the live coral tissue.

The carideans *Latreutes fucorum* and *Alpheus simus*, the anomuran *Pagurus brevidactylus*, the brachyurans *Portunus vocans* and *Tetraxanthus bidentatus* are reported for the first time in Venezuela.

## RESUMEN

En este trabajo se presentan aspectos sistemáticos y biológicos de las especies de crustáceos decápodos encontradas en partes vivas y muertas de colonias de tres especies del coral *Acropora* (*A. cervicornis*, *A. palmata* y *A. prolifera*). Estas colonias se colectaron durante un período de 9 meses en un arrecife coralino somero ubicado al extremo sur-oeste del Archipiélago de Los Roques, Venezuela.

Se capturaron un total de 1900 individuos pertenecientes a 30 especies. Se dan observaciones sobre la ecología, alimentación y reproducción de algunas de ellas.

Una gran parte de las especies registradas se encontró en la parte muerta de las colonias. Solamente el cangrejo *Domestia acanthophora* parece ser un verdadero comensal que depende del tejido vivo del coral.

Los carideos *Latreutes fucorum* y *Alpheus simus* el anomurido *Pagurus brevidactylus* y los branquiuros *Portunus vocans* y *Tetraxanthus bidentatus* son los primeros registros para Venezuela.

## INTRODUCTION

In recent years the study of decapod crustaceans associated to coral species has received much attention from marine biogeographers and ecologists. However, because most of the research has been conducted in the Indo-Pacific (Patton, 1966; Knudsen, 1967; Garth, 1974; Abele, 1976; Castro, 1976; Glynn, 1980; Abele & Patton, 1967; Prahl et al., 1978; Bak & Robertson, 1980; Edwards & Emberton, 1980; Austin et al., 1980) and in the subtropical Atlantic (McCloskey, 1970; Reed et al., 1982), there is little information on the occurrence, distribution and geographic range of Caribbean coral-inhabiting decapods. Patton's (1967) work in Puerto Rico was conducted exclusively on a single coral associated species, *Domestia acanthophora*, whereas Garth's (1978) and Velez's (1977) research involved extensive reef collections without intensive sampling on specific coral species.

The present paper, a first of a series on the ecology of decapod crustaceans inhabiting acroporid corals in the Archipelago Los Roques, Venezuela, provides a systematic account and other relevant information on the decapod species found in three species of the coral *Acropora*.

## GEOGRAPHIC SETTING AND STUDY AREA

The Archipelago Los Roques is an insular reef complex located at about 150 km north of the north central coast of Venezuela (fig. 1).

\* Scientific contribution No. 12 of the Fundación Científica Los Roques.

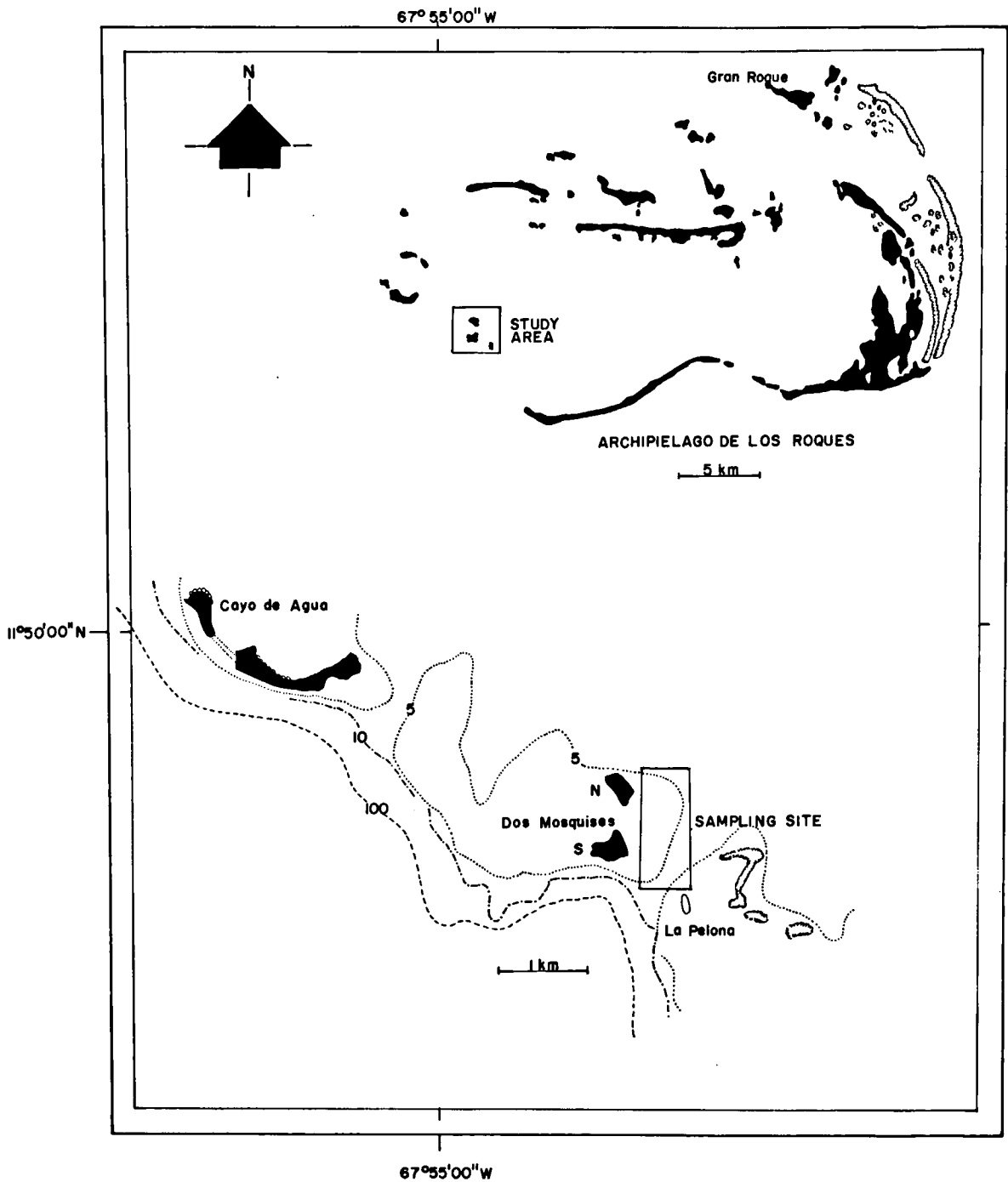


Fig. 1. The Archipiélago de los Roques (top) with location of general study area and sampling site (bottom).

Roughly, it forms an irregular oval of 36.6 km × 24.6 km on the east-west and north-south axis, respectively. It is formed by 42 islands and more than 200 sandbanks and reefs distributed

around a shallow lagoon (depth 1-5 m) in its centro-meridional portion.

The Archipelago, or more precisely the semiatoll, rests on a submarine igneous plateau

that rises sharply from depths of 900 to 1800 m. The winds and oceanic currents are predominantly from the east-northeast. The climate in the islands could be classified as arid-humid with an average annual precipitation of 300 mm.

The study was conducted on a reef flat at the leeward side of a horseshoe-shaped barrier reef that connects Dos Mosquises Norte and Dos Mosquises Sur, two nearby keys located at the extreme southwestern corner of the archipelago (fig. 1). The reef flat, with a depth of 0.7 to 1.2 m, has an extensive coral cover of *Acropora*, viz. *A. palmata* (Lamarck, 1816), *A. prolifera* (Lamarck, 1816), and *A. cervicornis* (Lamarck, 1816), although the corals *Porites* spp., *Agaricia* spp., and *Montastrea annularis* (Ellis & Solander, 1786), the octocorals *Plexaura* spp. and *Gorgonia* spp., and the hydrozoan *Millepora complanata* Lamarck, 1816, are also common. Water temperatures measured at the dock of the Marine Station at Dos Mosquises, less than 1 km away from the study site, varied from 25°C in winter (November-February) to 31°C in summer. Salinity ranged from 38.4 to 39.3‰.

#### MATERIAL AND METHODS

Sampling was conducted from January to November, 1981, and involved the in situ removal of 30 colonies of each *Acropora* species. The cumulative curve of number of decapod species versus number of removed colonies for each coral species indicated that 30 colonies was more than enough to collect most decapod species; the asymptote in the curve was reached at 14 colonies in *A. palmata*, 26 in *A. prolifera*, and 19 in *A. cervicornis*. The selected colonies were of a size which permitted handling and transportation. Each colony was covered by a highly resistant polyethylene bag to prevent the escape of the fauna, broken off at its base with a hammer and a chisel, and immediately transported to the Marine Laboratory where the colony was completely broken up to remove the crustacean fauna.

The live portion of the coral was weighed separately from the dead portion, thus permitting the estimation of live coral weight for each colony. Field observations on location, feeding and reproduction of conspicuous crustaceans were recorded on a submersible note board.

Specimens were preserved in a 7% formalin-seawater solution with few drops of glycerin, identified, catalogued, transferred to an alcohol solution and stored in the Museum of the Fundación Científica Los Roques at Caracas, Venezuela.

Morphometric measurements were made with a calibrated vernier and an ocular micrometer mounted in a Wild M8 stereomicroscope.

In Anomura and Brachyura, carapace width (C.W.) and length (C.L.) were measured and presented in that order, while in Natantia only carapace length was measured.

The symbol ♀ ov. refers to ovigerous females, and ♀ to non-ovigerous ones. The abbreviation "juv." refers to juveniles.

#### RESULTS

Before presenting the systematic account of the decapod crustaceans found in coral colonies of *Acropora* spp., it is important to mention that the plastic bag-enclosing method did not provide accurate information of the location on the colony of the specimens collected.

However, the vast majority of them were observed on the dead portions of the colonies. In fact, a statistical correlation made between the percent (%) weight of live coral and the number of individuals of the four most numerous species found (*Domecia acanthophora*, *Mythrax sculptus*, *Microphris bicornutus*, and *Thor manningi*), showed significant negative relationships for 3 of the species (table I). A positive correlation was found only for *D. acanthophora*.

A list of 1900 individuals from 30 species is reported in the following systematic account:

#### Suborder NATANTIA

##### Section CARIDEA

##### Family PALAEMONIDAE

##### Genus *Periclimenes* Costa, 1844

#### *Periclimenes americanus* (Kingsley, 1878)

Refs.: Holthuis, 1951: 60, pl. 19 figs. a-e; Williams, 1965: 43, fig. 36; Rodríguez, 1980: 90 fig. 27.

Material: 4♂, 1♀, 2♀ ov., 1 juv. in *A. prolifera*; 3♂, 5♀ ov., 9 juv. in *A. cervicornis*.

Size: 2.1 mm juv. to 5.9 mm ♂ C.L.

Range: Bahamas, North Carolina to Florida, West Indies.

Remarks: This tiny shrimp can be found com-

TABLE I

Pearson correlation coefficients between percent (%) weight of the live coral colony and number of individuals for the four most numerous species found in colonies of *Acropora* spp., collected from January through November, 1981.

	CORAL SPECIES		
	<i>A. cervicornis</i>	<i>A. prolifera</i>	<i>A. palmata</i>
<b>DECAPOD SPECIES</b>			
<i>Mythrax sculptus</i>	$r = -0.33$ ( $n = 443$ ) (1)	$r = -0.42$ ( $n = 96$ ) (2)	(*)
<i>Microphris bicornutus</i>	$r = -0.37$ ( $n = 80$ ) (1)	(*)	(*)
<i>Thor manningi</i>	(*)	$r = -0.48$ ( $n = 153$ ) (2)	(*)
<i>Domecia acanthophora</i>	$r = 0.79$ ( $n = 159$ ) (3)	$r = 0.56$ ( $n = 487$ ) (3)	(*)

(1) =  $p < 0.09$     (2) =  $p < 0.01$     (3) =  $p < 0.005$

(\*) = The number of individuals was too low for statistical analysis.

monly in shallow waters in coral, algae, and rocks. Seen on dead portions of the coral.

#### **Periclimenes iridescens** Lebour, 1949

Ref.: Holthuis, 1951: 43, pl. 12, pl. 20 figs. i-j.

Material: 2♂; 3♀ ov. in *A. cervicornis*.

Size: 1.7 mm ♂ to 2.6 mm ♀ ov. C.L.

Range: Bermuda, Cubagua island, Venezuela; in sand and algae to 100 m.

#### **Periclimenes rathbunae** Schmitt, 1924

Ref.: Holthuis, 1951: 58, pl. 17.

Material: 1 juv. in *A. cervicornis*.

Size: 2.9 mm C.L.

Range: Lesser Antilles.

Remarks: This species has been reported as a commensal of sea anemones, specially of *Stoichactis helianthus* (Ellis, 1767), commonly found on the dead portions of *Acropora*.

Genus *Periclimaneus* Borradaile, 1915

#### **Periclimaneus bermudensis** (Armstrong, 1940)

Refs.: Holthuis, 1951: 107, pl. 32 figs. d-g, pl. 33; Rodríguez, 1980: 93, fig. 28.

Material: 1♂ in *A. prolifera*.

Size: 1.6 mm C.L.

Range: Dry Tortugas, Bermuda, Bahamas, Los Roques; found inside *Callyspongia* and other sponges in shallow water.

Genus *Brachycarpus* Bate, 1888

#### **Brachycarpus biunguiculatus** (Lucas, 1846)

Refs.: Holthuis, 1951: 3, pl. 1; Rodríguez, 1980: 96, fig. 30.

Material: 2♀ ov. in *A. prolifera*.

Size: 7.1 and 7.3 mm C.L.

Range: Pantropical.

Remarks: It has been reported as a nocturnal cleaner (Criales & Corredor, 1977). Both specimens were found in a small cavity in a dead basal portion of *A. prolifera*.

Family ALPHEIDAE

Genus *Alpheus* Fabricius, 1798

**Alpheus cristulifrons** Rathbun, 1900

Refs.: Crosnier & Forest, 1966: 260, figs. 17-18; Rodríguez, 1980: 143, fig. 40 l-m.

Material: 12♂, 23 ♀ ov., 1 juv. in *A. prolifera*; 4♂, 5 ♀ ov., 2 juv. in *A. cervicornis*; 2♂, 2 ♀ ov. in *A. palmata*.

Size: From 2.2 mm juv. to 12.3 mm ♀ ov. C.L.

Range: Tropical Atlantic, Los Roques; in shallow water in coral, *Halimeda*, and sponges. Remarks: Most specimens were found in heterosexual pairs inhabiting small cavities of the dead portion of *Acropora*. In all pairs, the male was smaller (C.L.) than the female.

**Alpheus ridleyi** Pocock, 1890

Refs.: Crosnier & Forest, 1966: 230; Rodríguez, 1980: 149, fig. 42 d-f.

Material: 1♂, 1 ♀ ov. in *A. cervicornis*.

Size: 10.8 mm ♂ and 22.3 mm ♀ ov. C.L.

Range: Bahamas to Fernando Norhona, Brazil; in shallow water in rocks and pieces of coral. Remarks: Both specimens were found inhabiting the same cavity at the basal dead portion of the colony.

**Alpheus simus** Guérin-Méneville, 1856

Ref.: Guérin-Méneville, 1856: xix, pl. 2 fig. 11.

Material: 1♂, 1 ♀ in *A. prolifera*.

Size 6.0 mm ♂ and 3.7 mm ♀ C.L.

Range: Cuba, Curaçao, Los Roques. Remarks: This enigmatic species, senior synonym of *Crangon rathbunae*, is a new report for Venezuela. Both specimens were found inside a small crevice at the dead basal portion of the colony, and both were of a clean white color when collected.

Genus *Synalpheus* Bate, 1888**Synalpheus apioceros** Coutière, 1909

Refs.: Williams, 1965: 69, fig. 56; Rodríguez, 1980: 155.

Material: 2♂, 1 juv. in *A. prolifera*.

Size: 1.6 juv. to 6.5 mm ♂ C.L.

Range: Florida to Surinam, in shallow water, mangroves and sand.

Remarks: Found inside small crevices in dead basal portions of the colony.

**Synalpheus curacaoensis** Schmitt, 1924

Ref.: Schmitt, 1924: 66, fig. 3.

Material: 1♂, 1 ♀ ov., 1 juv. in *A. prolifera*.

Size: 1.7 mm juv. to 4.5 mm ♀ ov. C.L.

Range: Curaçao, Bonaire; in shallow water, under rocks and pieces of coral, and in the zoanthid *Zoanthus sociatus* (Ellis, 1767).

Remarks: Found inside small crevices in dead basal portions of the colonies.

**Synalpheus fritzmuelleri** Coutière, 1909

Refs.: Williams, 1965: 69, fig. 56; Rodríguez, 1980: 153.

Material: 5♂, 1 ♀, 4 ♀ ov. in *A. prolifera*; 7♂, 1 ♀, 3 ♀ ov. in *A. cervicornis*; 1♂, 1 ♀ in *A. palmata*.

Size: 1.8 mm ♂ to 5.7 mm ♂ C.L.

Range: North Carolina and Bermuda, to Santa Catarina, Brazil; Baja California; to 50 m in mangroves and coral rubble.

Remarks: Found inside small crevices in dead portions of the colonies.

**Synalpheus pandionis** Coutière, 1909

Refs.: Coutière, 1909: 67, fig. 39; Rodríguez, 1980: 161

Material: 1♂ in *A. prolifera*.

Size: 4.6 mm C.L.

Range: Gulf of Mexico to Barbados; to 60 m, in sand, coral rubble and rocks.

Remarks: Found inside small crevices in the dead basal portion of the colony.

## Family HIPPOLITIDAE

Genus *Thor* Kingsley, 1878**Thor cf. manningi** Chace, 1972

Ref.: Chace, 1972: 13, figs. 59-61.

Material: 67♂, 33 ♀, 28 ♀ ov., 25 juv., with 2 ♀ parasitized by an unidentified isopod in *A. prolifera*; 2♂, 8 ♀, 16 ♀ ov., 8 juv. in *A. cervicornis*; 2♂, 1 ♀, 1 ♀ ov. in *A. palmata*.

Size: 1.1 mm juv. to 3.2 mm ♂ in C.L.

Range: North Carolina to Curaçao, and westward to Yucatán; to a depth of 44 m.

Remarks: This polymorphic species is difficult to identify and only a few of the males had a prehensile dactylus in the third pereopod, as Chace (1972) remarks. This tiny shrimp was seen swimming from branch to branch of the corals, even on live portions of the colonies.

Genus *Latreutes* Stimpson, 1860

*Latreutes fucorum* (Fabricius, 1798)

Ref.: Williams, 1965: 78, fig. 63.

Material: 2 ♀ ov. in *A. cervicornis*.

Size: 3.6 mm and 3.2 mm C.L.

Range: Western North Atlantic between 10° and 50° N, Azores and Cape Verde Islands; pelagic and sublittoral.

Remarks: This is a new report for Venezuela. Usually found in floating *Sargassum* and other seaweeds.

Section STENOPODIDEA

Family STENOPODIDAE

Genus *Stenopus* Latreille, 1819

*Stenopus scutellatus* Rankin, 1898

Ref.: Rankin, 1898: 242, pl. 29 fig. 3.

Material: 1 ♂ in *A. prolifera*.

Size: 15.0 mm C.L.

Range: Bahamas and Gulf of Mexico, to Fernando Noronha, Brazil.

Remarks: This species has been reported as a nocturnal cleaner (Criales & Corredor, 1977) often found in heterosexual pairs. Observed on the dead basal portion of the colony with an ovigerous female that escaped from the plastic bag.

Suborder ANOMURA

Section GALATHEIDEA

Family PORCELANIDAE

Genus *Petrolisthes* Stimpson, 1858

*Petrolisthes galathinus* (Bosc, 1802)

Ref.: Gore & Abele, 1976: 702.

Material: 9 ♂, 2 ♀, 3 ♀ ov., 5 juv. in *A. prolifera*.

Size: From 2.6 mm × 2.9 mm juv. to 8.6 × 8.3 mm ♀ ov.

Range: Cape Hatteras to South Brazil, including the Caribbean. Also known from the Pacific.

Remarks: Observed only on dead portions of the colonies.

Section PAGURIDEA

Family PAGURIDAE

Genus *Paguristes* Dana, 1851

*Paguristes cadenati* Forest, 1954

Refs.: Forest, 1954: 353-357, figs. 3-4; Provenzano, 1961: 325.

Material: 1 ♂, 1 ♀, 4 ♀ ov. in *A. prolifera*.

Size: From 4.2 × 6.8 mm ♀ to 12.5 × 8.5 mm ♂.

Range: Florida, Guadeloupe, Curaçao; between 5 and 15 m.

Remarks: Found on dead portions of the colonies.

Genus *Pagurus* Fabricius, 1775

*Pagurus brevidactylus* (Stimpson, 1862)

Ref.: Provenzano, 1959: 413, fig. 20.

Material: 1 ♂, 2 ♀ ov. in *A. cervicornis*; 1 ♂ in *A. prolifera*.

Size: From 1.8 × 3.5 mm ♂ to 4.5 × 2.8 mm ♂.

Range: North Carolina, southwestern Florida, West Indies to Barbados.

Remarks: A new report for Venezuela, found on the dead portions of the colonies.

*Pagurus marshi* Benedict, 1901

Ref.: Provenzano, 1959: 405, fig. 17.

Material: 6 ♂, 1 ♀, 5 ♀ ov. in *A. cervicornis*; 2 ♂, 1 ♀, 1 juv. in *A. prolifera*.

Size: From 1.2 × 2.8 mm juv. to 7.6 × 8.0 mm ♂.

Range: Florida, Puerto Rico, Curaçao.

Remarks: Found on the dead portions of the colonies.

**Pagurus miamensis** Provenzano, 1959

Refs.: Provenzano, 1959: 414, fig. 21; Rodríguez, 1980: 232.

Material: 3♂, 1♀, 2♀ ov. in *A. prolifera*; 2♂ in *A. cervicornis*

Size: 2.0 × 2.7 mm ♀ ov. to 4.7 × 6.0 mm ♀.

Range: Bahamas, Florida, Curaçao and Venezuela; in sublittoral to 3 m.

Remarks: Found on the dead portions of the colony. A female in *A. cervicornis* was found with a parasitic isopod on the ventral side of the abdomen.

Suborder BRACHYURA

Section BRACHYGNATHA

Superfamily BRACHYRHINGHA

Family XANTHIDAE MacLeavy, 1838

Genus *Domecia* Eydoux & Souleyet, 1842

**Domecia acanthophora** forma *acanthophora*  
Desbonne & Schramm, 1867

Ref.: Guinot, 1964: 271, figs. 4, 5, 6, 7, 8, 15.

Material: 19♂, 18♀, 21♀ ov., and 14 juv. in *A. palmata*; 97♂, 56♀, 51♀ ov., and 283 juv. in *A. prolifera*; 67♂, 44♀, 21♀ ov., 27 juv. in *A. cervicornis*.

Size: 1.7 × 1.4 mm juv. to 11.5 × 8.7 mm ♂.

Range: Tropical Atlantic among sponges and branches of the corals *Acropora* and *Porites furcata* (Rathbun, 1925).

Remarks: This is by far the most common decapod crustacean collected. It is believed to produce structural modifications in *A. palmata*, which Patton (1967) named "resting places". These crevices and pits can be found in the upper portions of the corals and between branches. No structural deformations were observed in the upper portions of the other two *Acropora* species. Most crabs found in *A. palmata* crevices were ovigerous females, thus the sex ratio was

1 : 2.05 for *A. palmata*, as compared to 1 : 1.1 and 1 : 0.97 for *A. prolifera* and *A. cervicornis*, respectively. This species seems to be the only true commensal of acroporid corals in the Caribbean.

Genus *Chlorodiella* Rathbun, 1897

**Chlorodiella longimana** (H. Milne Edwards, 1834)

Ref.: Rathbun, 1930: 462, pl. 186.

Material: 8♂, 4♀, 2♀ ov., 6 juv. in *A. prolifera*; 1♂, 1 juv. in *A. cervicornis*.

Size: From 2.5 × 2.0 mm juv. to 21.3 × 13.2 mm ♂.

Range: Florida and Curaçao.

Remarks: Casually found on live portions of the coral.

Genus *Micropanope* Stimpson, 1871

**Micropanope spinipes** A. Milne Edwards, 1880

Ref.: Rathbun, 1930: 443, pl. 181 figs. 1, 2.

Material: 5♂, 4♀, 13 juv. in *A. cervicornis*; 2 juv. in *A. prolifera*.

Size: From 1.1 × 3.0 mm juv. to 6.1 × 4.1 mm ♀.

Range: Florida keys to Islas Albrohlos, Brazil, Bahamas, Curaçao.

Genus *Paraliomera* Rathbun, 1930

**Paraliomera longimana** (A. Milne Edwards, 1865)

Ref.: Rathbun, 1930: 243, pl. 101 figs. 1-3.

Material: 3♂, 9♀ in *A. prolifera*; 4♂, 3♀ in *A. palmata*.

Size: From 5.1 × 2.3 mm ♀ to 10.4 × 5.5 mm ♂.

Range: Florida to northern South America, Bermuda.

Remarks: All specimens were found inside cavities and tunnels in the dead portion of the colonies. The tunnels are generally deep and sometimes cross the bases of the colony. The

colonies had to be completely broken up to remove specimens.

Genus *Phymodius* A. Milne Edwards, 1863

***Phymodius maculatus*** (Stimpson, 1860)

Refs.: Rathbun, 1930: 295, pl. 136; Rodríguez, 1980: 355.

Material: 2♂, 1♀ in *A. cervicornis*; 1 juv. in *A. prolifera*.

Size: From 3.0 × 2.0 mm juv. to 18.9 × 16.7 mm ♂.

Range: Bahamas and Florida Keys, Caribbean sea.

Genus *Tetraxanthus* Rathbun, 1898

***Tetraxanthus bidentatus*** (A. Milne Edwards, 1880)

Ref.: Rathbun, 1930: 458, pl. 184.

Material: 1♂ in *A. cervicornis*.

Size: 3.8 × 2.5 mm.

Range: North Carolina and Gulf of Mexico to Cape Frio, Brazil.

Remarks: A new report for Venezuela.

Family PORTUNIDAE Rafinesque, 1815

Genus *Portunus* Weber, 1795

***Portunus vocans*** (A. Milne Edwards, 1878)

Ref.: Rathbun, 1930: 60, pl. 25 figs. 8, 9.

Material: 1♂ in *A. prolifera*.

Size: 8.7 × 5.6 mm.

Range: Cuba, Jamaica, Haiti, and Ascension Island in the South Atlantic; between 35 and 220 m.

Remarks: A new report for Venezuela; this tiny portunid can be found in calcareous sand, coral rubble and in sea grass flats.

Superfamily OXYRHINCHA

Family MAJIDAE; Subfamily Mithracinae

Genus *Mithrax* Latreille, 1817

***Mithrax sculptus*** (Lamarck, 1818)

Ref.: Rathbun, 1925: 442, figs. 125, 126, pl. 152.

Material: 226♂, 76♀, 11♀ ov., 130 juv. in *A. cervicornis*; 48♂, 37♀, 6♀ ov., 15 juv. in *A. prolifera*; 1♂, 1♀, 8 juv. in *A. palmata*.

Size: From 8.2 × 7.2 mm juv. to 26.9 × 24.9 mm ♂.

Range: Caribbean Sea; in grass flats, coral rubble and rocks; shallow water to 60 m.

Remarks: This crab was commonly found on the dead portions of the colonies, and was seen feeding on the associated algae.

***Mithrax forceps*** (A. Milne Edwards, 1875)

Refs.: Rathbun, 1925: 431, pl. 156; Williams, 1965: 258, figs. 238, 245e.

Material: 13♂, 6♀, 16 juv. in *A. prolifera*; 14♂, 15♀, 38 juv. in *A. cervicornis*.

Size: From 1.1 × 1.1 mm juv. to 12.3 × 11.2 mm ♀.

Range: From North Carolina to Rio de Janeiro, Brazil; shallow water to 50 m.

Remarks: As with *M. sculptus*, this species was commonly observed feeding on the dead portions of the colonies.

Genus *Microphris* H. Milne Edwards, 1851

***Microphris bicornutus*** (Latreille, 1825)

Refs.: Rathbun, 1925: 489, fig. 139, pl. 173; Williams, 1965: 259, figs. 239, 245 f; Rodríguez, 1980: 293, pl. 30.

Material: 26♂, 3♀ ov., 51 juv. in *A. cervicornis*; 1♂, 1♀, 1♀ ov., 2 juv. in *A. prolifera*; 1♀ in *A. palmata*.

Size: From 1.7 × 2.4 mm juv. to 17.8 × 23.9 mm ♂.

Range: North Carolina to Santa Catarina, Brazil; to 67 m in mangrove roots, coral and *Thalassia*.

Remarks: Observed only on the dead portions of the colonies.

## DISCUSSION

The 30 species found in 3 acroporid coral species in the Archipiélago de Los Roques is a surprisingly large number if compared to the 25



and 15 decapod species reported by Patton (1966) and Garth (1974) for acroporids in Sri Lanka and the Maldiv Islands respectively, located both in the Indo-Pacific where the pool of decapod species is considerably larger than in the Caribbean. However, their sampling methods appear not to be adequate enough to prevent the escape of the associated fauna. Thus, the lack of information on crustaceans found on acroporid corals in the Caribbean and for that matter in any other region of the world, plus the fact that different methods have been used in studying this fauna, renders difficult the comparative analysis of our findings.

Researches on the decapod community of coral species are few. In the Pacific, Abele (1976) found 55 species in the coral *Pocillopora damicornis* (Linnaeus, 1758), Edwards & Ember-ton (1980) sampled 47 species in *Stylophora pistillata* Esper, 1797, and Coles (1980) located 127 species in *Pocillopora meandrina* Dana, 1846, and indicated that both live and dead coral were sampled. In the subtropical Atlantic, Reed et al. (1982) reported 52 decapod species for the coral *Oculina varicosa* Lesueur, 1821, whereas McCloskey (1970) found 19 species on an apparently similar species, *Oculina arbuscula* (Dana, 1848).

At first hand it seems that the above coral species have a richer decapod community than the 3 species of *Acropora* in Los Roques. This difference could be due to the fact that the other coral species are structurally more complex than *Acropora*. However, at present it is impossible to make any solid comparison of decapod communities among coral species, or geographical areas.

Most of the decapod species found in the present study were located in the dead portions of the colonies. Possibly they utilize these areas as refuges against predators or as reproductive and feeding shelters. Only *Domecia acanthophora* seems to be a true commensal that depends on the live coral tissue, as reported by Patton (1967). It appears also that the structural deformations produced by this crab in branches of *A. palmata* are utilized as reproductive shelters by the large ovigerous females, and this could ac-

count for the fact that the ovigerous/non-ovigerous ratio of females collected in *A. palmata* was 2 : 1, while it was 1 : 1 in *A. prolifera* and *A. cervicornis*. This result was confirmed by our observations that most crevices in *A. palmata* were occupied by ovigerous females of *D. acanthophora*. Further research could prove that these crevices not only serve as resting places, as indicated by Patton (1967), but as shelters for reproduction and brood care as well.

The geographical distribution of the decapod species found in the three species of *Acropora* from the Archipiélago de Los Roques is primarily insular with a strong affinity in species composition with the South Florida (19 species shared), the Caribbean and Bermuda (18 species shared), and the West Indian Provinces (16 species shared). The weakest affinities seem to exist with the Tropical Brazilian (12 species shared) and the Caribbean Provinces (10 species shared). Three of the species also occur in the Eastern Atlantic and two in the South Atlantic. Although these affinities may indicate possible biogeographic relationships and patterns in population mixing and/or existence of biogeographic barriers, the relationships should be taken with caution as they might simply reflect differential sampling efforts conducted in the different provinces.

The caridean *Latreutes fucorum*, the palae-monid *Alpheus simus*, the anomuran *Pagurus brevidactylus* and the brachyurans *Portunus vocans* and *Tetraxanthus bidentatus* constitute new reports for Venezuela.

#### ACKNOWLEDGEMENTS

We thank the staff of the Fundación Científica Los Roques at Dos Mosquises, and at Caracas, for their help and enthusiasm throughout the project, particularly Ernesto Weil for his assistance in the logistics, Dr. Gilberto Rodríguez for confirming some of the identifications, and Pablo Rodríguez for drawing the map. This project was made possible by a grant of CONICIT.

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First draft received 24 February 1983

Revised draft received 15 May 1984