

Decapod crustaceans inventory of La Pecha Island, archipelago Los Frailes, Venezuela

Tagliafico¹, A.; Gassman, J.; Fajardo, C.; Marcano, Z.; Lira, C. and Bolaños, J.

Universidad de Oriente, Escuela de Ciencias Aplicadas del Mar, Laboratorio de Carcinología, Boca de Río, Isla de Margarita, Venezuela.

¹ E-mail: alejandrotagliafico@yahoo.com

Abstract

Only two species of crustaceans have been reported so far for the Archipelago Los Frailes: *Mithrax verrucosus* and *Speloeophorus pontifer*. To contribute to the knowledge of Venezuelan crustacean fauna, organisms were collected at "La Pecha", the second largest isle of the Archipelago, from the rocky shore to a maximum of 12 m in depth, using SCUBA diving and snorkelling. A total of 523 organisms were collected and 67 species were identified, included in 18 families. The families with highest species richness were: Porcellanidae (13 spp), Xanthidae (12 spp), Majidae (10 spp) and Alpheidae (7 spp). The presence of *Megalobrachium mortenseni* represents the second report of its species for Venezuelan waters. The occurrence of *Panulirus argus* is also relevant due to their commercial importance. The present work is the first crustacean inventory carried out in the Archipelago.

Key words: biodiversity, benthos, Caribbean sea.

Introduction

Studies of reef ecosystems have acquired greater importance internationally due in part to the lack of taxonomic information of such ecosystems and to the celebration of the Biological Diversity Convention of Río de Janeiro. Venezuela is a signatory of the Convention and is committed to carry out inventories and monitor its national biodiversity (UNESCO, 1992).

The study of Venezuelan island decapod crustaceans has received great attention, with systematic studies like those of Chace (1956), Scelzo and Varela (1988), García *et al.* (1998) and Lira *et al.* (2001). However, the Archipelago Los Frailes, a group of seven isles that occupy an approximate area of 45 hectares, located at 16 km northeast of Margarita Island (Cervigón, 1989; 1992) has been poorly studied. Only two species of decapod crabs have been reported so far: *Mithrax verrucosus* Milne Edwards, 1832 by Rodríguez, (1980) and *Speloeophorus pontifer* (Stimpson, 1871) by Bolaños *et al.*, (2000).

Within the frame of a scientific general program to study biodiversity, the Ministerio del Ambiente y Recursos Naturales (2001) emphasizes the need for studies that will increase the knowledge of regional species. This carcinologic summary seeks to contribute to the local biodiversity information of the taxa and therefore become the first step in the management and protection of the Archipelago Los Frailes.

Materials and Methods

The present study was carried out in the second largest isle (14 km²) known as La Pecha in the northwest of the Archipelago Los Frailes (63°45'N, 11°12'W). Six diurnal surveys were made between November 2003 and February 2004, amounting to a total sampling effort of 120 hours. The organisms were collected using SCUBA diving and snorkelling, from the

supralittoral zone to 12 m in depth. Rocks were also collected, along with dead corals for close inspection once they were out of water. Specimens were identified in the carcinology laboratory of the Instituto de Investigaciones Científicas (Universidad de Oriente), using descriptions, keys, figures and photographs of Rathbun (1918), Chace (1972), Rodríguez (1980), Williams (1984), Abele and Kim (1986), and Melo (1999).

Results and Discussion

A total of 523 samples were analysed and 67 species were identified belonging to 42 genera and 14 families (Table I). The species richness of the most representative families were: Porcellanidae (13 spp), Xanthidae (12 spp), Majidae (10 spp) and Alpheidae (7 spp).

The present study reports 67 species of decapod crustaceans, of which only *M. verrucosus* was previously reported for the Archipelago by Rodríguez (1980). *S. pontifer* has also been reported, but it's known to be associated with an octopus (Bolaños *et al.*, 2000), and this explains why it was not found during this survey, as no octopus were sampled. Nevertheless, this study elevates the richness of crustacean fauna reported for the Archipelago to 68 species. Los Frailes, as in many Caribbean Islands, is under the influence of strong upwellings which fertilize coastal waters and increase productivity. This phenomenon might indirectly favour high diversity of benthic species in the ecosystem, as suggested by Margalef (1974).

This work ratifies the presence of *M. mortenseni* in Venezuelan waters; this species had only been reported once before by Lira *et al.* (2001) in Margarita Island.

Dromia erythropus was observed with a yellow sponge in its dorsal region, behaviour which, according to McLay (1983), is typical for dromids which have complex relationships with the sponges.

The spine lobster *P. argus* is an important commercial species for the fisheries of the Archipelago (Cervigón, 1992) while *M. verrucosus*, *M. caribbaeus* and *D. erythropus* are occasionally caught in fish traps and sold in the locals markets.

A few other species were observed, but could not be captured with the equipment and techniques used and the study did not focus on the examination of equinoderms, poriferous and gorgonies which can be potential hosts for decapod crustaceans. Therefore, we recommend a more profound systematic study of the crustaceans in the Archipelago to make the inventory as realistic as possible.

The present list of decapods gives additional zoogeographical notes for studies of crustacean distribution in the Caribbean. The considerable richness of species in the Isle opens the door for more studies in the Archipelago in an ecological approach, so as to obtain quantitative descriptions of the communities, estimates of abundance and distribution. We consider these aspects extremely important due to the tourist and fishery activities which are carried out in the Archipelago.

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Table I: Species of decapod crustaceans, number of specimens (by sex), sizes and substrate type from the survey of La Pecha isle, Archipelago Los Frailes, Venezuela.

Family	Genera and species	♂	♀	*Size ranges (mm)		Substrate
				L	W	
	<i>Microprosthema semilaeve</i> (von Martens, 1872)	1	-	12.7	7.3	crevices
Stenopodidae Claus, 1872	<i>Stenopus hispidus</i> (Olivier, 1811)	1	-	22.0	13.2	in caves associated <i>Diadema antillarum</i>
	<i>Stenopus scutellatus</i> Rankin, 1898	1	-	9.0	1.6	crevices
	<i>Alpheus amblyonyx</i> Chace, 1972	-	2	12.8 10.0	5.5 4.6	dead coral
	<i>Alpheus armatus</i> Rathbun, 1901	1	1	14.7 14.6	7.2 7.5	on anemone <i>Bartholomea annulata</i>
Alpheidae Rafinesque 1815	<i>Alpheus armillatus</i> Milne Edwards, 1837	4	3	12.0 9.2	5.4 4.1	on corals and rocks
	<i>Alpheus cristulifrons</i> Rathbun, 1900	-	1	2.1	1.0	on rocks
	<i>Alpheus ridleyi</i> (Podock, 1890)	-	1	6.0	2.1	on rocks
	<i>Synalpheus fritzmuelleri</i> Coutière, 1909	1	-	7.43	1.6	on rocks
	<i>Synalpheus minus</i> (Say, 1818)	-	2	10.5 9.1	5.8 5.3	corals and rocks
	<i>Brachycarpus biunguiculatus</i> (Lucas, 1849)	2	-	14.9 14	5.3 5.0	between rocks
Palaemonide Rafinesque, 1815	<i>Periclimenes pedersoni</i> Chace, 1958	-	2	6.3 5.0	1.3 1.2	on anemones
	<i>Periclimenes rathbunae</i> Schmitt, 1924.	2	-	7.2 5.6	2.9 2.1	on anemones
	<i>Periclimenes yucatanicus</i> (Ives, 1891)	-	1	8.2	1.5	on anemone <i>Epicystis</i> sp.
	<i>Pontonia mexicana</i> (Guérin-Méneville, 1855)	1	1	9.8 7.2	3.2 2.9	inside <i>Atrina seminuda</i>
Hippolytidae Dana, 1852	<i>Lysmata wurdemanni</i> (Gibbes, 1850)	-	1	16.7	3.5	between rocks
	<i>Thor amboinensis</i> (De Man, 1888)	1	1	3.0 2.4	1.6 1.3	on <i>Epicystis</i> sp.
Palinuridae Latreille, 1802	<i>Panulirus argus</i> (Latreille, 1804)	1	-	67.2	39.3	caves and rocks
	<i>Megalobrachium mortenseni</i> (Haig, 1962)	-	1	6.6	5.5	under dead corals
	<i>Megalobrachium poeyi</i> (Guérin-Méneville, 1855)	2	9	9.2 4.0	9.4 4.4	under dead corals
	<i>Pachycheles monilifer</i> (Dana, 1852)	13	11	7.0 2.6	7.4 2.0	on and between rock

Porcellanidae Howorth, 1825	<i>Pachycheles riisei</i> (Stimpson, 1858)	1	1	4.0 3.8	5.0 4.6	on and between rock
	<i>Petrolisthes amoenus</i> (Guérin-Méneville, 1855)	3	2	9.0 5.0	9.1 5.2	under rocks
	<i>Petrolisthes armatus</i> (Gibbes, 1850)	2	0	5.4 4.4	5.2 4.2	under rocks
	<i>Petrolisthes galathinus</i> (Bosc, 1802)	4	8	12.5 5.2	12.5 5.0	under rocks and <i>Millepora</i> sp.
	<i>Petrolisthes magdalenensis</i> Werdinger, 1978	3	1	7.0 4.4	10.0 4.2	under rocks
	<i>Petrolisthes jugosus</i> Streets, 1872	-	3	4.1 3.2	4.4 3.2	under rocks
	<i>Petrolisthes politus</i> (Gray, 1831)	1	3	10.2 9.7	9.0 8.7	under rocks
	<i>Petrolisthes quadratus</i> (Benedict, 1901)	5	7	8.0 4.1	8.1 4.3	under rocks
	<i>Petrolisthes tonsorius</i> (Haig, 1960)	1	1	6.2 3.0	7.5 2.7	under rocks
<i>Porcellana sayana</i> (Leach, 1820)	-	1	6.2	5.3	under dead coral	
Diogenidae Ortmann, 1892	<i>Calcinus tibicen</i> (Herbst, 1791)	7	6	7.5 2.0	6.0 1.6	on <i>Millepora</i> sp. and inside <i>Thais</i> <i>deltoida</i> conch
	<i>Dardanus fucosus</i> Biffar and Provenzano, 1972	1	-	17.8	15.1	on rocks inside <i>Leucozonia naza</i> conch
	<i>Paguristes tortugae</i> Schmitt, 1933	2	-	1.8 1.7	1.9 1.3	on rocks and inside <i>Druppa</i> <i>nodulosa</i> conch
Paguridae Latreille, 1802	<i>Pagurus brevidactylus</i> (Stimpson, 1859)	3	-	2.6 2.2	1.9 1.7	on <i>Millepora</i> sp. and inside <i>T.</i> <i>deltoida</i> conch
	<i>Pagurus stimpsoni</i> (A. Milne Edwards and Bouvier, 1893)	-	1	5.2	2.5	on rocks and inside <i>T. deltoida</i> conch
Dromiidae De Haan, 1833	<i>Dromia erythropus</i> George Edwards, 1771)	-	1	79.1	86.2	cave of rocks
Nauplius	<i>Acanthonyx petiverii</i> H. Milne Edwards, 1834	-	1	12.0	9.6	on rocks
	<i>Microphrys bicornutus</i> (Latreille, 1825)	2	2	12.1 8.6	9.0 5.5	on <i>Millepora</i> sp
	<i>Mithraculus cinctimanus</i> (Stimpson, 1860)	1	-	10.5	9.4	between rocks
	<i>Mithraculus coryphe</i> (Herbst, 1801)	16	19	17.6 7.4	21.5 9.2	on rocks
	<i>Mithraculus forceps</i> (A. Milne Edwards, 1875)	74	65	40.3 2.0	40.1 2.4	between rocks and corals
	<i>Mithraculus ruber</i> (Stimpson, 1871)	5	6	15.2 3.9	19.0 4.4	on rocks
	<i>Mithrax caribbaeus</i> Rathbun, 1920	3	3	30.3 1.1	37.4 1.4	under rocks and dead coral

Majidae Samouelle, 1819	<i>Mithrax verrucosus</i> Milne Edwards, 1832	7	8	1.1 49.0	56.0 1.2	between rocks and corals
	<i>Pitho aculeata</i> (Gibbes, 1850)	11	22	15.0 5.6	9.7 4.4	under rocks and sand
	<i>Stenorhynchus seticornis</i> (Herbst, 1788)	1	1	34.4 28.2	9.41 8.5	in rocks
Portunidae Rafinesque, 1815	<i>Cronius rubber</i> (Lamarck, 1818)	1	1	32.2 24.4	51.4 39.6	sand and rocks
	<i>Portunus sebae</i> (H. Milne Edwards, 1834)	2	-	44.1 34.9	84.6 66.6	on rocks
Xanthidae MacLeay, 1838	<i>Actaea setigera</i> (Milne Edwards, 1834)	-	1	9.1	13.7	on rocks
	<i>Cataleptodius floridanus</i> (Gibbes, 1850)	20	11	12.4 7.2	17.3 10.4	on rocks and dead corals
	<i>Chlorodiella longimana</i> (H. Milne Edwards, 1834)	-	1	9.6	13.9	sand
	<i>Domecia acanthophora</i> <i>acanthophora</i> (Desbonne and Schramm, 1867)	4	1	7.4 4.2	8.3 4.8	between rocks
	<i>Eurypanopeus abbreviatus</i> (Stimpson, 1860)	4	4	9.0 4.0	12.5 6.1	between rocks
	<i>Heteractaea ceratopus</i> (Stimpson, 1860)	10	16	9.0 2.4	6.4 3.5	on rocks
	<i>Ozius reticulatus</i> (Desbone and Schramm, 1867)	2	3	11.9 9.3	17.9 11.7	sand and rocks
	<i>Panopeus occidentalis</i> Saussure, 1857	1	-	10.0	1.3	under rock
	<i>Paraliomera dispar</i> (Stimpson, 1781)	-	1	4.8	5.1	under rocks
	<i>Phymodius maculatus</i> (Stimpson, 1860)	-	1	15.71	22.1	under dead corals
Pinnotheridae Haan, 1833	<i>Platypodiella spectabilis</i> (Herbst, 1794)	7	2	15.1 5.0	21.4 6.5	on corals and sponges
	<i>Xantho denticulatus</i> White, 1848	2	3	16.5 6.6	22.4 9.8	on rocks
	<i>Tunicotheres moseri</i> (Rathbun, 1918)	-	1	5.0	4.7	inside <i>Phallusia</i>
Grapsidae MacLeay, 1838	<i>Geograpsus lividus</i> (H. Milne Edwards, 1837)	2	-	20.7 7.9	23 16	on rocks
	<i>Grapsus grapsus</i> (Linnaeus, 1758)	5	-	61.6 7.1	69.4 8.0	on rocks
	<i>Pachygrapsus transversus</i> (Gibbes, 1850)	1	-	7.53	8.1	between rocks
	<i>Percnon gibbesi</i> (H. Milne Edwards, 1853)	4	1	21.1 7.9	18.6 7.1	under <i>D.</i> <i>antillarum</i>
	<i>Plagusia depressa</i> (Fabricius, 1775)	10	3	51.6 32.2	55.76 51.4	on rocks

* Length and width of carapace respectively.

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