



Revista mexicana de biodiversidad

ISSN: 1870-3453

ISSN: 2007-8706

Instituto de Biología

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Revista mexicana de biodiversidad, vol. 89, no. 2, 2018, pp. 382-392
Instituto de Biología

DOI: 10.22201/ib.20078706e.2018.2.2149

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Taxonomy and systematics

An updated checklist of the reef fishes of the Southeastern Reefs Marine Sanctuary of the Dominican Republic

Lista actualizada de los peces arrecifales del Santuario Marino Arrecifes del Sureste, República Dominicana

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Received: 23 February 2017; accepted: 3 noviembre 2017

Abstract

This work presents an updated taxonomic list of the fish fauna of the coral reefs in the Southeastern Reefs Marine Sanctuary (SMASE) in the Dominican Republic. The inventory is the result of 360 visual surveys of coral reefs during the period 2013-2016. We recorded 150 species from 86 genera and 47 families, including 14 new records for the southeast coastline of the Dominican Republic. The families of fishes with the highest species number comprised Serranidae (16 species), Haemulidae (12 species) and Pomacentridae (10 species).

Key words: Coral reefs; Biodiversity; Caribbean; Ichthyofauna, Marine Protected Area

Resumen

En este trabajo se presenta una lista taxonómica actualizada de la ictiofauna para los arrecifes de coral del Santuario Marino Arrecifes del Sureste (SMASE) en República Dominicana. El inventario es resultado de 360 censos visuales realizados en los arrecifes coralinos entre 2013 y 2016. Se incluyen 150 especies, pertenecientes a 86 géneros y 47 familias, conteniendo 14 nuevos registros para la costa sureste dominicana. Las familias de peces con mayor número de especies fueron Serranidae (16 especies), Haemulidae (12 especies) y Pomacentridae (10 especies).

Palabras clave: Arrecifes coralinos; Biodiversidad; Caribe; Ictiofauna; Área Marina Protegida

Introduction

The southeastern (SE) reefs of the Dominican Republic are located along the coast of Hispaniola, in the Caribbean Sea. These reefs are distributed along a semi-continuous fringing reef dominated by the rocky and coral substrate and are fringing reefs with some small and dispersed coral

patches (Geraldes, 2003). The region forms part of the Southeastern Reefs Marine Sanctuary (SMASE), covering an area of 7,855.31 km². In 2009, this region was declared a Protected Marine Area by Dominican Government Decree 571-09 to conserve the natural habitat and unique environment that exists along the continental shelf on the SE part of the island (SINAP, 2014). Additionally, this

region is regarded as an area of great importance due to its biodiversity, its variety of marine and coastal ecosystems (mangrove, sea grasses, rocky/sandy beaches, coral reefs), and its economic value, which originates from coastal and touristic development (Vargas, 2011).

Several studies of fish fauna have been conducted in the area; Williams et al. (1983) provided the first checklist of 172 marine fishes of the south coast of Dominican Republic. Another study reported the abundance of fishes in shallow (algal/seagrass) habitats (León et al., 1996). Bustamante et al. (1998) and Chiappone et al. (1998) provided information about reef fish assemblages. More recently, Schmitt et al. (2002) listed a total of 125 species in 36 families of reef fishes in 4 reefs (Dominicus Reef, La Raya, Rubén, and El Toro) of the SE Dominican Republic. However, little data has been gathered about the overall marine biodiversity, and there is a lack of information about the fish fauna in particular.

In this work, we generated an updated checklist of fish fauna associated with the coral formations of the SMASE. The checklist was based on field surveys and including the reefs of Catalina Island (La Pared) and adjacent to the municipality of Bayahibe (Coralina, Atlantic Princess, Magallán, and Pepito I and II) for the first time.

Materials and methods

The SMASE is formed by a reef system located near the SE part of the island Hispaniola (SINAP, 2014), between 18°22'9" - 18°11'4" N, 68°51'9" - 68°38'15" W (Fig. 1). This region is part of the Central Province of the Greater Caribbean; the area is located between Saona Island in the Cotubanama National Park and east of Puerto Rico, where the Mona Passage is located (Geraldine &

Vega, 2004). This area is characterized by shallow sand banks, meadows of sea grasses, and coral reefs. To the southeast of Saona Island, there are fringing reefs with a deeper and wider shelf, where beds are mixed with low-lying hard corals and sea grasses (Chiappone, 2001; Vega et al., 1997).

The study site was a 35 Km section of the coastline located between the eastern portion of Catalina Island and the southern part of Saona Island. Expeditions were carried out from 2013-2016. A total of 360 visual surveys were conducted (daytime, between 9 a.m. and 1 p.m.) via the Roving Diver Technique (RDT), in the RDT method trained SCUBA divers swim around the reef site approximately 30-45 minutes recording all fish species observed (REEF, 2008). In this manner, 10 fringing reefs on the SE coast were selected for sampling by geographical location, the east-west location, reef type and depth (< 15 m of depth) (Table 1).

The individuals observed were identified following the Cervigón et al. (1992), Humann and Deloach (2002) and Robertson et al. (2016) identification guides and were systematically ordered according to FishBase criteria (Froese & Pauly, 2016). For interpretation of the biogeographic affinities of the species, analysis of the following regions in Eschmeyer and Fricke's catalog of fishes (2016) was used: WA = Western Atlantic, EA = Eastern Atlantic, CIRC = Circumtropical, and IS = Invasive species (De Freitas & Lotufo, 2014).

Results

A total of 150 species of reef fishes from 86 genera and 47 families were observed in the transects (Table 2).

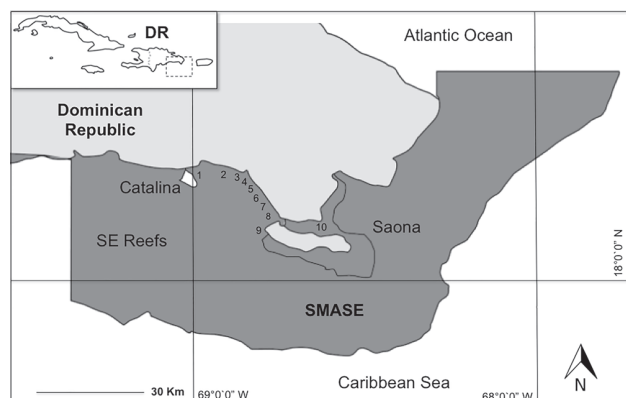


Figure 1. Geographic location of the SMASE in the Dominican Republic. Each number corresponds to 1 of the 10 selected reefs under study (Table 1).

Table 1

Sites of study (visual surveys) of fish associated with coral reefs in the SMASE. Geographical coordinates (decimal degrees) and depths (m) are included.

Reef	Latitude (N)	Longitude (W)	Depth
1. La Pared	18°15'28.8"	68°46'55.2"	6
2. Coralina	18°22'12"	68°50'49.2"	4
3. Atlantic Princess	18°22'8.4"	68°51'7.2"	13
4. Magallán	18°21'43.2"	68°50'45.6"	13
5. Pepito I	18°20'42"	68°49'58.8"	14
6. Pepito II	18°20'34.8"	68°49'48"	14
7. Dominicus Reef	18°20'34.8"	68°49'58.8"	13
8. El Peñón	18°15'10.8"	68°46'44.4"	13
9. Punta Cacón	18°10'37.2"	68°47'31.2"	14
10. Cayo Ratón	18°11'42"	68°38'13.2"	4

Table 2

Taxonomic list of fish fauna observed in the SMASE coral reefs of La Pared (LP), Coralina (C), Atlantic Princess (AP), Magallán (M), Pepito I (PI), Pepito II (PII), Dominicus Reef (DR), El Peñón (EP), Punta Cacón (PC), and Cayo Ratón (CR). An * indicates a new record for the area.

Order, family and species	
Order Anguilliformes	
Family Congridae	
<i>Hetecococonger longissimus</i> (Günther, 1870)	C, LP, PII
Family Muraenidae	
<i>Echidna catenata</i> (Bloch, 1795)	EP, PC
<i>Gymnothorax funebris</i> (Ranzani, 1839)	AP, PI, PII
<i>Gymnothorax miliaris</i> (Kaup, 1856)	EP, PII
<i>Gymnothorax moringa</i> (Cuvier, 1829)	EP, LP
<i>Gymnothorax vincinus</i> (Castelnau, 1855)	EP
Family Ophichthidae	
<i>Myrichthys breviceps</i> (Richardson, 1848)	DR
Order Aulopiformes	
Family Synodontidae	
<i>Synodus foetens</i> (Linnaeus, 1766)	EP, CR, PII
<i>Synodus intermedius</i> (Spix & Agassiz, 1829)	EP, PC, DR, C, AP, LP, M, PI, PII
Order Beloniformes	
Family Belonidae	
<i>Ablennes hians</i> (Valenciennes, 1846)	C, M
Family Hemiramphidae	
* <i>Hemiramphus balao</i> (Lesueur, 1821)	EP, C, AP
* <i>Hemiramphus brasiliensis</i> (Linnaeus, 1758)	EP, PC, DR, AP, M, PI
Order Beryciformes	
Family Holocentridae	
<i>Myripristis jacobus</i> (Cuvier, 1829)	EP, PC, DR, C, AP, CR, PI
<i>Sargocentron coruscum</i> (Poey, 1860)	EP, PC, DR, AP, LP, M, PI, PII
Order Lophiiformes	
Family Antennariidae	
<i>Antennarius multiocellatus</i> (Valenciennes, 1837)	EP
Order Myliobatiformes	
Family Dasyatidae	
<i>Dasyatis americana</i> (Hildebrand & Schroeder, 1928)	EP, PII
Family Myliobatidae	
<i>Aetobatus narinari</i> (Euphrasen, 1790)	DR, M, PI, PII
Family Urotrygonidae	
<i>Urobatis jamaicensis</i> (Cuvier, 1816)	EP, PC, CR
Order Orectolobiformes	
Family Ginglymostomatidae	
<i>Ginglymostoma cirratum</i> (Bonnaterre, 1788)	PC, CR

Table 2

Continues.

Order, family and species	
Order Perciformes	
Family Acanthuridae	
<i>Acanthurus bahianus</i> (Castelnau, 1855)	EP, PC, DR, C, AP, LP, CR, M, PI
<i>Acanthurus chirurgus</i> (Bloch, 1787)	EP, DR, C, LP, CR
<i>Acanthurus coeruleus</i> (Bloch & Schneider, 1801)	EP, PC, DR, C, AP, LP, CR, M, PI
Family Apogonidae	
<i>Astrapogon stellatus</i> (Cope, 1867)	PC, C, CR
Family Carangidae	
<i>Caranx bartholomaei</i> (Cuvier, 1833)	PI, PII
<i>Caranx ruber</i> (Bloch, 1793)	EP, PC, DR, C, AP, LP, CR, PII
* <i>Seriola dumerili</i> (Risso, 1810)	M
<i>Trachinotus blochii</i> (Lacepède, 1801)	EP, PC, CR, PI, PII
Family Chaenopsidae	
<i>Acanthemblemaria spinosa</i> (Metzelaar, 1919)	EP, PC, DR, AP, LP, CR, M, PI
* <i>Emblemariopsis</i> sp. (Longley, 1927)	DR
Family Chaetodontidae	
<i>Chaetodon aculeatus</i> (Poey, 1860)	PC, DR, C, AP, PII
<i>Chaetodon capistratus</i> (Linnaeus, 1758)	CR, PII
<i>Chaetodon ocellatus</i> (Bloch, 1787)	EP, PC, DR, C, AP, LP, CR, M, PI, PII
<i>Chaetodon sedentarius</i> (Poey, 1860)	EP, PC, DR
<i>Chaetodon striatus</i> (Linnaeus, 1758)	EP, PC, DR, C, AP, LP, CR, M, PI
Family Cirrhitidae	
<i>Amblycirrhitus pinos</i> (Mowbray, 1927)	C, CR
Family Echeidae	
<i>Echeneis naucrates</i> (Linnaeus, 1758)	PI, PII
Family Gobiidae	
<i>Coryphopterus personatus</i> (Jordan & Thompson, 1905)	EP, PC, DR, AP, LP, M, PI, PII
<i>Elacatinus prochilos</i> (Böhlke & Robins, 1968)	EP, PC, DR, C, AP, LP
Family Haemulidae	
<i>Anisotremus surinamensis</i> (Bloch, 1791)	AP
<i>Anisotremus virginicus</i> (Linnaeus, 1758)	DR, AP, PII
<i>Haemulon album</i> (Cuvier, 1830)	EP, DR, C, AP, LP, CR, M, PI, PII
<i>Haemulon aurolineatum</i> (Cuvier, 1830)	PC, AP, PII
<i>Haemulon carbonarium</i> (Poey, 1860)	EP, PC, DR, AP, PI
<i>Haemulon chrysargyreum</i> (Günther, 1859)	EP, C, CR, PII
<i>Haemulon flavolineatum</i> (Desmarest, 1823)	EP, DR, C, AP, LP, M
<i>Haemulon macrostomum</i> (Günther, 1859)	EP, PC, DR, C, AP, LP, CR, M, PI, PII
<i>Haemulon melanurum</i> (Linnaeus, 1758)	EP, DR, LP
* <i>Haemulon parra</i> (Desmarest, 1823)	EP, DR
<i>Haemulon plumieri</i> (Lacepède, 1801)	EP, DR, PII

Table 2

Continues.

Order, family and species	
<i>Haemulon sciurus</i> (Shaw, 1803)	EP, DR, AP, CR, PII
Family Kyphosidae	
<i>Kyphosus</i> sp. (Lacepède, 1801)	EP, PC, DR
Family Labridae	
<i>Bodianus rufus</i> (Linnaeus, 1758)	CR, PII
<i>Clepticus parrae</i> (Bloch & Schneider, 1801)	EP, PC, DR, AP, LP, M, PI
<i>Halichoeres bivittatus</i> (Bloch, 1791)	EP, PC, DR, C, AP, CR, PII
<i>Halichoeres garnoti</i> (Valenciennes, 1839)	EP, C, LP, PII
<i>Halichoeres radiatus</i> (Linnaeus, 1758)	EP, PC, DR, C, AP, LP, CR, PI, PII
<i>Lachnolaimus maximus</i> (Walbaum, 1792)	EP, C
<i>Thalassoma bifasciatum</i> (Bloch, 1791)	EP, PC, DR, C, AP, LP, CR, M, PI
Family Labrisomidae	
<i>Malacoctenus triangulatus</i> (Springer, 1959)	EP
Family Lutjanidae	
<i>Lutjanus analis</i> (Cuvier, 1828)	PC, AP
<i>Lutjanus apodus</i> (Walbaum, 1792)	EP, PC, DR, C, AP, CR
* <i>Lutjanus cyanopterus</i> (Cuvier, 1828)	EP
<i>Lutjanus griseus</i> (Linnaeus, 1758)	EP, PC, CR
<i>Lutjanus jocu</i> (Bloch & Schneider, 1801)	EP, C, AP
<i>Lutjanus mahogoni</i> (Cuvier, 1828)	EP, DR, C, AP, M, PI, PII
<i>Lutjanus synagris</i> (Linnaeus, 1758)	EP, DR, AP, M, PII
<i>Ocyurus chrysurus</i> (Bloch, 1791)	EP, PC, DR, C, AP, LO, DR, PI
Family Malacanthidae	
<i>Malacanthus plumieri</i> (Bloch, 1786)	EP, PC, PI, PII
Family Mullidae	
<i>Mulloidichtys martinicus</i> (Cuvier, 1829)	EP, PC, DR, AP, LP, PI, PII
<i>Pseudupeneus maculatus</i> (Bloch, 1793)	EP, PC, DR, AP, CR, PI, PII
Family Opistognathidae	
* <i>Ophioblennius macclurei</i> (Silvester, 1915)	C, LP, CR
<i>Opistognathus aurifrons</i> (Jordan & Thompson, 1905)	EP, DR
Family Pomacanthidae	
<i>Holacanthus ciliaris</i> (Linnaeus, 1758)	EP, DR
<i>Holacanthus tricolor</i> (Bloch, 1795)	CR
<i>Holocentrus adscensionis</i> (Osbeck, 1765)	EP, PC, DR, CR, M, PI
<i>Holocentrus rufus</i> (Walbaum, 1792)	EP, AP, CR
<i>Neoniphon marianus</i> (Cuvier, 1829)	EP
<i>Pomacanthus arcuatus</i> (Linnaeus, 1758)	CR
<i>Pomacanthus paru</i> (Bloch, 1787)	CR
Family Pomacentridae	
<i>Abudefduf saxatilis</i> (Linnaeus, 1758)	EP, C, AP, LP, CR, PII

Table 2

Continues.

Order, family and species	
<i>Chromis cyanea</i> (Poey, 1860)	EP, DR, CR
<i>Chromis multilineata</i> (Guichenot, 1853)	DR
<i>Microspathodon chrysurus</i> (Cuvier, 1830)	EP, PC, DR, C, AP, LP, CR, M, PI, PII
* <i>Stegastes adustus</i> (Troschel, 1865)	
<i>Stegastes diencaeus</i> (Jordan & Rutter, 1897)	EP, PC, DR, C, AP, LP, CR, M, PI, PII
EP, PC, DR, C, AP, LP, CR, M, PI	
<i>Stegastes leucostictus</i> (Müller & Troschel, 1848)	EP, PC, DR, C, AP, LP, CR, M, PI
<i>Stegastes partitus</i> (Poey, 1868)	EP, PC, DR, C, AP, LP, CR, M, PI
<i>Stegastes planifrons</i> (Cuvier, 1830)	EP, PC, DR, C, AP, LP, CR, M, PI
<i>Stegastes variabilis</i> (Castelnau, 1855)	EP, PC, DR, C, AP, LP, CR, M, PI
Family Priacanthidae	
<i>Heteropriacanthus cruentatus</i> (Lacepède, 1801)	EP, PC, DR, PI, PII
<i>Priacanthus arenatus</i> (Cuvier, 1829)	EP
Family Scaridae	
<i>Scarus guacamaia</i> (Cuvier, 1829)	EP
<i>Scarus iseri</i> (Bloch, 1789)	EP, PC, DR, C, AP, LP, CR, M, PII
<i>Scarus taeniopterus</i> (Desmarest, 1831)	EP, PC, DR, C, AP, LP, M, PI, PII
<i>Scarus vetula</i> (Bloch & Schneider, 1801)	LP, M
<i>Sparisoma atomarium</i> (Poey, 1861)	EP, PC, DR
<i>Sparisoma aurofrenatum</i> (Valenciennes, 1840)	EP, PC, DR, C, AP, LP, CR, M, PI
<i>Sparisoma chrysopterus</i> (Bloch & Schneider, 1801)	EP, PC, DR, C, CR, PII
<i>Sparisoma rubripinne</i> (Valenciennes, 1840)	EP, C
<i>Sparisoma viride</i> (Bonnaterre, 1788)	EP, PC, DR, AP, LP, CR, M, PI, PII
Family Sciaenidae	
<i>Equetus punctatus</i> (Bloch & Schneider, 1801)	AP, CR, M, PII
<i>Pareques acuminatus</i> (Bloch & Schneider, 1801)	EP, PC, DR, PI
Family Scombridae	
<i>Scomberomorus regalis</i> (Bloch, 1793)	C, AP, LP
Family Serranidae	
<i>Cephalopholis cruentata</i> (Lacepède, 1802)	EP, PC, DR, AP, LP, DR, M, PI, PII
<i>Cephalopholis fulva</i> (Linnaeus, 1758)	EP, PC, DR, AP, PII
<i>Epinephelus adscensionis</i> (Osbeck, 1765)	EP, PC
<i>Epinephelus guttatus</i> (Linnaeus, 1758)	EP, PC, DR, C, AP, LP, CR, M, PI
<i>Epinephelus striatus</i> (Bloch, 1792)	EP, PC, DR, AP, LP, PII
<i>Hypoplectrus indigo</i> (Poey, 1851)	EP
<i>Hypoplectrus puella</i> (Cuvier, 1828)	EP, PC, DR, C, PI, PII
<i>Hypoplectrus unicolor</i> (Walbaum, 1792)	EP, PC, DR, C, AP, LP, M, PI
* <i>Mycteroperca bonaci</i> (Poey, 1860)	DR
<i>Mycteroperca tigris</i> (Valenciennes, 1833)	EP, AP
<i>Paranthias furcifer</i> (Valenciennes, 1828)	PC, AP

Table 2

Continues.

Order, family and species	
<i>Rypticus saponaceus</i> (Bloch & Schneider, 1801)	EP, PC, DR, C, PII
<i>Serranus baldwini</i> (Evermann & Marsh, 1899)	EP, PII
<i>Serranus tabacarius</i> (Cuvier, 1829)	EP, PC, DR
<i>Serranus tigrinus</i> (Bloch, 1790)	EP, PC, DR, AP, LP M, PI
Family Sparidae	
<i>Calamus bajonado</i> (Bloch & Schneider, 1801)	EP, PC, DR
<i>Calamus calamus</i> (Valenciennes, 1830)	EP
<i>Calamus penna</i> (Valenciennes, 1830)	EP, PII
<i>Calamus pennulata</i> (Guichenot, 1868)	EP
Family Sphyraenidae	
<i>Sphyraena barracuda</i> (Walbaum, 1792)	EP, CR, PII
Order Pleuronectiformes	
Family Bothidae	
<i>Bothus lunatus</i> (Linnaeus, 1758)	EP, DR, C, AP, M, PII
Order Scorpaeniformes	
Family Dactylopteridae	
<i>Dactylopterus volitans</i> (Linnaeus, 1758)	EP, PC, DR, C, AP, LP, CR, M, PI
Family Scorpaenidae	
* <i>Pterois volitans</i> (Linnaeus, 1758)	EP, PC, DR, C, AP, LP, CR, M, PI
<i>Scorpaena plumieri</i> (Bloch, 1789)	EP, PC, DR
Order Syngnathiformes	
Family Aulostomidae	
<i>Aulostomus maculatus</i> (Valenciennes, 1837)	EP, PC, DR, C, AP, LP, CR, M, PI
Family Syngnathidae	
* <i>Cosmocampus elucens</i> (Poey, 1868)	DR
* <i>Hippocampus reidi</i> (Ginsburg, 1933)	EP, PC, DR, AP, M
* <i>Halicampus crinitus</i> (Jenyns, 1842)	DR
Order Tetraodontiformes	
Family Balistidae	
<i>Balistes vetula</i> (Linnaeus, 1758)	EP, CR, PII
<i>Canthidermis sufflamen</i> (Mitchill, 1815)	PC, PII
<i>Melichthys niger</i> (Bloch, 1786)	EP, PC, DR, PII
* <i>Balistes capriscus</i> (Gmelin, 1789)	PC, DR
Family Diodontidae	
<i>Diodon holocanthus</i> (Linnaeus, 1758)	EP, PC, DR, LP, PII
<i>Diodon hystrix</i> (Linnaeus, 1758)	EP, PC, DR, C, AP, LP, PII
Family Monacanthidae	
<i>Aluterus schoepfii</i> (Walbaum, 1792)	C, PII
<i>Aluterus scriptus</i> (Osbeck, 1765)	EP, PC, DR, AP, M, PI, PII
<i>Cantherhines macrocerus</i> (Hollard, 1853)	EP, DR

Table 2

Continues.

Order, family and species	
<i>Cantherhines pullus</i> (Ranzani, 1842)	EP
<i>Monacanthus tuckeri</i> (Bean, 1906)	M
Family Ostraciidae	
<i>Lactophrys bicaudalis</i> (Linnaeus, 1758)	EP, DR, AP, PII
<i>Lactophrys trigonus</i> (Linnaeus, 1758)	EP, PII
<i>Lactophrys triqueter</i> (Linnaeus, 1758)	EP, PC, DR, C, AP, LP, PI
Family Tetraodontidae	
<i>Acanthostracion polygonia</i> (Poey, 1876)	EP, PC, DR, AP, PII
<i>Acanthostracion quadricornis</i> (Linnaeus, 1758)	EP, PC, DR
<i>Canthigaster rostrata</i> (Bloch, 1786)	EP, PC, DR, C, AP, LP, PI
<i>Chilomycterus antennatus</i> (Cuvier, 1816)	EP, PC, DR, C, LP, CR, M, PI, PII

The greatest number of species counted in the surveys belonged to the order Perciformes, with 105 species (70%), followed by the Tetraodontiformes with 18 (12.1%) and the Anguilliformes with 7 (4.7%). Determination of the species richness indicated that the families Serranidae (16 species; 10.7%), Haemulidae (12 species; 8.1%), and Pomacentridae (10 species; 6.3%) were the most speciose. The remaining families had lower levels of species richness (< 9). *Haemulon* and *Lutjanus*, with 7 species each, were the most species-rich genera, followed by *Chaetodon*, *Stegastes*, and *Sparisoma* with 5 species. The genera *Calamus*, *Scarus*, and *Gymnothorax*, were represented by 4 species (Fig. 2), while the rest (78 genera) were represented by not more than 3 species in the area (Fig. 3).

We documented 14 new records for the area of influence of the SMASE (9.4% of the total): *Cosmocampus elucens* Poey, 1868, *Emblemariopsis* sp. Longley, 1927, *Haemulon parra* Desmarest, 1823, *Hemiramphus balao* Lesueur, 1821, *Hemiramphus brasiliensis* Linnaeus, 1758, *Hippocampus reidi* Ginsburg, 1933, *Lutjanus cyanopterus* Cuvier, 1828, *Halicampus crinitus* Jenyns, 1842, *Mycteroperca bonaci* Poey, 1860, *Ophioblennius macclurei* Silvester, 1915, *Seriola dumerili* Risso, 1810, *Stegastes adustus* Troschel, 1865, *Balistes capricornis* Gmelin, 1789 and *Pterois volitans* Linnaeus, 1758 (Fig. 4).

Discussion

The list of species registered in this work constitutes the first record for the reefs La Pared, Coralina, Atlantic Princess, Magallán, Punta Cacón, and Pepito I and II, all in the SE region of the Dominican Republic.



Figure 2. Some fish species belonging to species-rich genera in the SMASE: A) the Smallmouth grunt *Haemulon chrysargyreum*; B) the Princess parrotfish *Scarus taeniopterus*; C) the Four-eye butterflyfish *Chaetodon capistratus*; D) the Green moray *Gymnothorax funebris*; E) the Threespot damselfish *Stegastes planifrons*, and F) the initial phase of the Redband parrotfish *Sparisoma aurofrenatum*. Photos: J. Calle-Triviño (C), B. Jiménez (A, D, E) and C. Cortés-Useche (B, F).

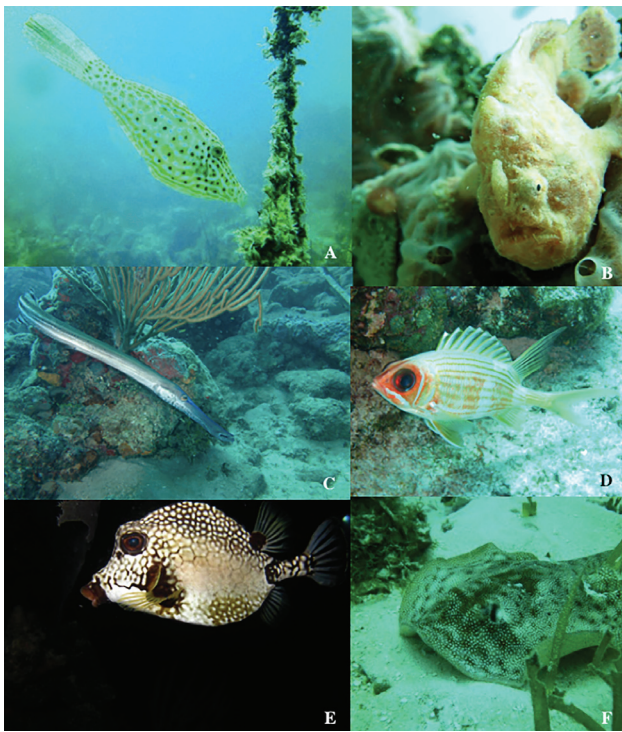


Figure 3. Some fish species in the SMASE: A) the Scrawled filefish *Aluterus scriptus*; B) the Longlure frogfish *Antennarius multiocellatus*; C) the Atlantic trumpetfish *Aulostomus maculatus*; D) the Longspine squirrelfish *Holocentrus rufus*; E) the Smooth trunkfish *Lactophrys triqueter*, and F) the Yellow stingray *Urobatis jamaicensis*. Photos: J. Calle-Triviño (A), B. Jiménez (B, D, E) and C. Cortés-Useche (C, F).

The species richness (150) is consistent with other studies, including the most represented families being Serranidae, Scaridae, and Haemulidae (Bustamante et al., 1998; Schmitt et al., 2002; Williams et al., 1983). Additionally, most of the species observed in this study (93.3%) are widely distributed in coral reefs of the tropical western Atlantic (Joyeux et al., 2001), including the lionfish, which originated in the Indo-Pacific Ocean and has widely invaded the Atlantic coast and Caribbean region (Schofield, 2009). Only 6 species present in the SMASE are on the Red List of the International Union for Conservation of Nature (IUCN), 5 species are assessed as vulnerable (*Coryphopterus personatus* Jordan & Thompson, 1905, *Elacatinus prochilos* Böhlke & Robins, 1968, *Lachnolaimus maximus* Walbaum, 1792, *Lutjanus cyanopterus* Cuvier, 1828, and *Balistes capriscus* Gmelin, 1789) and 1 as endangered (*Epinephelus striatus* Bloch, 1792).

This study recorded 150 species, which represents a 17% increase in the number of species compared with the most recent previous study, which identified 125 species



Figure 4. Some newly recorded fish species in the SMASE: A) the Short pipefish *Cosmocampus elucens*; B) the Banded pipefish *Halicampus crinitus*; C) the Blackhead blenny *Emblemariopsis* sp.; D) the Dusky damselfish *Stegastes adustus*; E) the Longsnout seahorse *Hippocampus reidi*, and F) the Red Lionfish *Pterois volitans*. Photos: J. Calle-Triviño (C), B. Jiménez (B, F), A. Luis-Báez (E) and C. Cortés-Useche (D).

(Schmitt et al., 2002). However, it is worth noting that the use of other sampling techniques, such as a detailed cryptic survey or rotenone collections, would increase the number of species recorded (Del Moral-Flores et al., 2013). Nonetheless, the RDT is useful for species detection, and Schmitt et al. (2002) concluded that it is a good sampling method for achieving a better representation of the fish community (more species) (Francisco-Ramos & Arias - González, 2013).

Local species richness may be related to environmental conditions and ecological relationships (e.g., topographic complexity), with different reefs providing different amounts of habitat availability and diversity in which fishes can feed and reproduce (Gratwicke & Speight, 2005). These reefs present rough surfaces with holes that serve as refuges, and they have substrates with complex structures. Furthermore, their proximity to mangroves and sea grasses may increase species richness (Rogers et al., 2014).

This study adds 14 new records of fishes present in coral reefs of the SE region of the coast of the Dominican Republic. A comprehensive inventory of fish species is critical for an assessment of the biodiversity and ecological relationships on reefs and will play a significant role in the conservation of endangered coral reef habitats.

Acknowledgments

The authors thank the staff of Dominican Foundation for Marine Studies and the Coral Reefs Ecosystems Ecology Laboratory of the Center for Research and Advanced Studies - Campus Mérida (CINVESTAV-IPN). The authors also thank the National Council for Science and Technology (Conacyt) for their valuable contribution. Camilo Cortés-Useche thanks the mixed program grants provided by Conacyt (290936) and support of FOMIX (YUC-2014-C17-247043). We thank the Ministry of Environment and Natural Resources of the Dominican Republic for permission to work in the Marine Protected Area. We would also like to thank Dr. Benjamin C. Victor from the Nova Southeastern University (Florida) for their kind support identifying the chaenopsid blenny *Emblemariopsis* sp. Berlin Jiménez and Núria Torras Rovira for their photographs.

References

- Bustamante, G., Chiappone, M., Geraldès, F. X., Pugibet, E., Schmitt, E., Sluka, R. et al. (1998). Reef fish assemblages and fisheries in Parque Nacional Del Este, Dominican Republic. *Proceedings of the 50th Gulf and Caribbean Fisheries Institute*, 50, 917–937.
- Cervigón, F., Cipriani, R., Fischer, W., Garibaldi, L., & Hendrickx, M. (1992). *Guía de campo de las especies comerciales marinas y de aguas salobres de la costa septentrional de Sur América*. Roma: Food and Agriculture Organization of the United Nations.
- Chiappone, M., Sluka, R., Sullivan-Sealey, K. M., Schmitt, E., Bustamante, G., Kelly, J. et al. (1998). Comparison of grouper assemblages in Northern areas of the wider Caribbean: a preliminary assessment. *Proceedings of the 50th Gulf and Caribbean Fisheries Institute*, 50, 427–451.
- Chiappone, M. (2001). *Coral reef conservation in marine protected areas a case study of Parque Nacional del Este*. Arlington, Virginia: The Nature Conservancy.
- De Freitas, J. E. P., & Lotufo, T. M. D. C. (2014). Reef fish assemblage and zoogeographic affinities of a scarcely known region of the western equatorial Atlantic. *Journal of the Marine Biological Association of the United Kingdom*, 95, 623–633.
- Del Moral-Flores, L. F., Tello-Musi, J. L., Reyes-Bonilla, H., Pérez-España, H., Martínez-Pérez, J. A., Horta-Puga, G. et al. (2013). Lista sistemática y afinidades zoogeográficas de la ictiofauna del Sistema Arrecifal Veracruzano, México. *Revista Mexicana de Biodiversidad*, 84, 825–846.
- Eschmeyer, W. N., & Fricke, R. (2016). Catalog of fishes: genera, species, references. Recuperado el 09 septiembre, 2016 de: <http://research.calacademy.org/research/ichthyology/catalog/fishcatmain.asp/>
- Francisco-Ramos, V., & Arias-González, J. E. (2013). Additive partitioning of coral reef fish diversity across hierarchical spatial scales throughout the Caribbean. *Plos One*, 8, e78761.
- Froese, R., & Pauly, D. (2016). Fishbase. World Wide Web electronic publication. Recuperado el 09 septiembre, 2016 de: <http://www.fishbase.org/>
- Geraldès, F. X. (2003). The coral reefs of Dominican Republic. In J. Cortés (Ed), *Latin American coral reefs* (pp. 77–110). Amsterdam: Elsevier.
- Geraldès, F. X., & Vega, M. (2004). *The coral reefs of Dominican Republic*. Santo Domingo, República Dominicana: Centro de Investigaciones de Biología Marina, Universidad Autónoma de Santo Domingo.
- Gratwicke, B., & Speight, M. R. (2005). Effects of habitat complexity on Caribbean marine fish assemblage. *Marine Ecology Progress Series*, 292, 301–310.
- Humann, P., & DeLoach, N. (2002). *Reef fish identification: Florida, Caribbean, Bahamas*, 3th Ed. Jacksonville: New World Publications.
- Joyeux, J. C., Floeter, S. R., Ferreira, C. E. L., & Gasparini, J. L. (2001). Biogeography of tropical reef fishes: the South Atlantic puzzle. *Journal of Biogeography*, 28, 831–841.
- León, Y., Pugibet, E., & Sluka, R. (1996). The abundance of fishes in shallow, algal/seagrass habitats in the waters surrounding Parque Nacional del Este, Dominican Republic. *Proceedings of the 48th Gulf and Caribbean Fisheries Institute*, 48, 259–271.
- REEF (Reef Environmental Education Foundation). (2008). Reef Environmental Education Foundation. Recuperado el 11 de septiembre, 2017 de: <http://www.reef.org>
- Robertson, R. D., Peña, E., Posada, J. M., & Claro, R. (2016). Peces: *Gran Caribe, una guía para peces costeros del Caribe y cercanías*. Instituto Smithsonian de Investigaciones Tropicales. Recuperado el 07 de octubre, 2016 de: http://stri.si.edu/espanol/personal_cientifico/personal_cientifico/cientifico.php/
- Rogers, A., Blanchard, J. L., & Mumby, P. J. (2014). Vulnerability of coral reef fisheries to a loss of structural complexity. *Current Biology*, 24, 1000–1005.
- Schmitt, E. F., Sluka, R., & Sullivan-Sealey, K. M. (2002). Evaluating the use of roving diver and transect surveys to assess the coral reef fish assemblage off southeastern Hispaniola. *Coral Reefs*, 21, 216–223.
- Schofield, P. J. (2009). Geographic extent and chronology of the invasion of non-native lionfish (*Pterois volitans* [Linnaeus 1758] and *P. miles* [Bennett 1828]) in the Western North Atlantic and Caribbean Sea. *Aquatic Invasions*, 4, 473–479.
- SINAP (Sistema Nacional de Áreas Protegidas República Dominicana). (2014). *Sistema Nacional de Áreas Protegidas*

- República Dominicana - Base Legal*. Santo Domingo, Rep. Dominicana: Ministerio de Medio Ambiente y Recursos Naturales.
- Vargas, R. (2011). *Management effectiveness of Parque Nacional del Este Dominican Republic*. Ontario: University of Waterloo.
- Vega, M., Chiappone, M., Delgado, G., Wright, R., & Sullivan, K. (1997). *Evaluación ecológica integral del Parque Nacional del Este República Dominicana*. Bahamas: The Nature Conservancy.
- Williams, E. H., Clavijo, I., Kimmel, J. J., Colin, P. L., Díaz-Carela, C., Bardales, A. T. (1983). A checklist of marine plants and animals of the south coast of the Dominican Republic. *Caribbean Journal of Science*, 19, 39–54.