

The shallow-water echinoids (Echinodermata: Echinoidea) of Cuba

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This paper provides the most up to date list of the Cuban echinoid fauna. Habitat, depth range, distribution and localities in Cuba are presented for this group. I present here the most recent list of shallow-water sea urchins for the Cuban Archipelago. This catalogue increases the number of shallow-water sea urchins for Cuba to 23 species (subspecies included) distributed in seven orders and 19 genera. I have added the occurrence of the sea urchin Schizaster floridiensis for Cuban shallow waters, and expand the known regional distribution range for this species. Furthermore, I report here two new depth ranges for Schizaster floridiensis and Astropyga magnifica that now begin at ten and two metres depth respectively.

Keywords: Echinodermata, Echinoidea, new record, *Schizaster floridiensis*, *Astropyga magnifica*, Cuba

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INTRODUCTION

Echinoderms are exclusively marine invertebrates with more than 7,000 extant species and more than 13,000 extinct species distributed in five classes (Durham *et al.*, 1966; Hendler *et al.*, 1995). Members of this phylum inhabit in different biotopes from the intertidal zone to the abyssal regions in all latitudes, and their presence is relevant in coral reef and other shallow waters ecosystems (Pawson, 1982; Miller & Pawson, 1989). The first studies in Cuba began with expeditions conducted by the US vessels 'Blake', 'Fish Hawk' and 'Albatross', during the second half of the 19th Century and the first quarter of the 20th Century (Del Valle *et al.*, 2005). Inconsistent fieldworks before the 1960s decreased the number of new reports and/or new species.

The class Echinoidea is represented in Cuba by 63 species distributed in 13 orders, 23 families and 35 genera (Del Valle-García *et al.*, 2013); and where 21 species of them inhabit in shallow-waters (Del Valle *et al.*, 2005). Hence, a new record of the genus *Schizaster* (former *Paraster*) was added in the last decade (Rodríguez-Barreras *et al.*, 2007). This small sea urchin remains burrowed in sandy substrates (Hendler *et al.*, 1995), and they are usually found because of the presence of the remains (tests) on the surface sediments (Chesher, 1966; Rodríguez-Barreras *et al.*, 2013). The genus *Schizaster* has been reported at several localities in the Caribbean and the Gulf of Mexico (Chesher, 1966; Kier, 1975; Hendler *et al.*, 1995; Alvarado *et al.*, 2008; Solís-Marín *et al.*, 2013), but not yet for the Cuba Archipelago.

Recently a new catalogue of the Cuban crinoids was published by Rodríguez-Barreras & Messing (2013). Now, the present paper represents a second effort to provide the most updated list of the Cuban shallow-water sea urchins, and include a new record for Cuba. Furthermore, I provide valuable information

about habitat, depth range, general distribution, and localities in Cuba where the species have been previously reported.

MATERIALS AND METHODS

This new list is based on information from marine collections in Cuba at the National Aquarium of Cuba, and the 'Felipe Poey' Museum at the University of Havana (Del Valle *et al.*, 2005). The taxonomic classification was updated following Solís-Marín *et al.*, (2013) and the *World Register of Marine Species* (WoRMS, www.marinespecies.org). The criterion for shallow-water was set at 60 m depth (Rodríguez-Barreras *et al.*, 2013). Two tests under the name of *Paraster doederleini* Chesher 1972, and deposited in the collection of the National Aquarium of Cuba were reanalysed in detail.

RESULTS

The present study presents a list of 23 echinoids (subspecies included), distributed in 7 orders and 19 genera. In addition, I add a new record (*Schizaster floridiensis*) for Cuban shallow waters.

Phylum ECHINODERMATA Klein, 1754
Class ECHINOIDEA Leske, 1778
Order CIDAROIDEA Claus, 1880
Family CIDARIDAE Gray, 1825
Genus *Eucidaris* Pomel, 1883

Eucidaris tribuloides tribuloides (Lamarck, 1816)

HABITAT

In small holes and crevices of rocky bottoms, seagrass beds, sandy bottoms and rubble (Hendler *et al.*, 1995; Solís-Marín *et al.*, 2013).

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DEPTH RANGE

From 0 to 1500 m, but it is common in less than 50 m (Serafy, 1979; Solís-Marín *et al.*, 2013).

DISTRIBUTION

Cape Hatteras, North Carolina, Gulf of Mexico, Central America (Belize, Guatemala, Honduras, El Salvador, Nicaragua, Costa Rica and Panama), south throughout the Caribbean to Rio de Janeiro, Brazil (Abreu *et al.*, 2000; Borrero-Pérez *et al.*, 2002; Herrera-Moreno & Betancourt, 2004; Durán-González *et al.*, 2005; Laguarda-Figueras *et al.*, 2005; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

South of Guanahacabibes Peninsula, off Havana, north of Artemisa and Mayabeque provinces, Keys Diego Pérez, Cantiles, Juan García, Sigua, Guillermo, Media Luna, Fragoso, north coast of Boca Chica and Confitas Keys, and the east coast of Romano Key, Punta del Este (Isle of Youth), Canarreos Archipelago, Santa Clara Bay, Santa Lucía, Recalo, Strombus, and Maternillo beaches, north of Tortuguillas, Isabela de Sagua (Sabana-Camagüey Archipelago), Girón Beach (south of Matanzas), Jardines de La Reina, and Cape Cruz (Suárez, 1974; Del Valle *et al.*, 2005).

REMARKS

There is another sub-species (*Eucidaris tribuloides africana* Mortensen, 1909), distributed from the Cape Verde Islands and the Gulf of Guinea (Hendler *et al.*, 1995).

Genus *Stylocidaris* Mortensen, 1909

Stylocidaris affinis (Philippi, 1845)

HABITAT

Sandy substrates, coral reefs, muddy bottoms and among rubbles (Serafy, 1979; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 22 to 1000 m, but is most common between 50 and 200 m (Boone, 1933; Serafy, 1979).

DISTRIBUTION

Adriatic Sea, Aegean Sea, Central Mediterranean (France and Italy), Mediterranean Sea—Eastern Basin, Bay of Biscay and Cape Verde. Known from the Atlantic off Maryland and Bermudas; Bahamas, through the Gulf of Mexico to Flower Gardens off Texas; Greater and Lesser Antilles to Colombia, Venezuela, Nicaragua, Panama, Canary Islands, Cape Verde Islands and Cuba (Serafy, 1979; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Baracoa (north-east of Havana), Cochinos and Matanzas Bay, Caibarién, Punta Alegre (Villa Clara) and Tánamo Harbor (Suárez, 1974; Abreu *et al.*, 2000).

Order DIADEMATOIDA Duncan, 1889

Family DIADEMATIDAE Gray, 1855

Genus *Astropyga* Gray, 1825

Astropyga magnifica A.H. Clark, 1934

HABITAT

In muddy and sandy bottoms, limestones, seagrass beds and mixed substrates (Hendler *et al.*, 1995).

DEPTH RANGE

From 5 to 89 m (Solís-Marín *et al.*, 2013); however, the species has been found at 8 m in Cuba (Espinosa *et al.*, 1997). In addition, two adults were seen at 2 m in Culebra Island (18°19'1.91"N 65°19'2.53"W) during surveys in 2013. This personal observation could be considered a new shallowest depth range for the species.

DISTRIBUTION

This species has been reported from South Carolina, the south-eastern Gulf of Mexico, Panama, through the Greater and Lesser Antilles to Panama, Colombia, Venezuela and Surinam (Serafy, 1979; Borrero-Pérez *et al.*, 2002; Del Valle-García *et al.*, 2005; Durán-González *et al.*, 2005; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009).

CUBAN LOCALITIES

North-east coast of Havana (Municipio Playa) and Pinar del Río (La Ortigosa) (Espinosa *et al.*, 1997; Abreu *et al.*, 2000).

Genus *Diadema* Gray, 1825

Diadema antillarum Philippi, 1845

HABITAT

Coral reef ecosystems, associated with mangrove roots, sand flats and rocky hard grounds (Serafy, 1979; Hendler *et al.*, 1995). Occasionally, the species can be found within seagrass meadows associated with small rocky patches (personal observation).

DEPTH RANGE

From 0 to 800 m (Solís-Marín *et al.*, 2013), but is most common in shallow water no deeper than 50 m (Hendler *et al.*, 1995).

DISTRIBUTION

It has been reported in the western Atlantic from eastern Florida to Brazil, Bahamas, Bermudas, the Caribbean coast of Central America, Cuba, Dominican Republic, Puerto Rico, Jamaica, and the Lesser Antilles (Hendler *et al.*, 1995; Herrera-Moreno & Betancourt, 2004; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Off Havana, Punta del Este (Isle of Youth), Ensenada de Corrientes and Guanahacabibes (Pinar del Río), Diego Pérez, Cantiles, and Juan García Keys (Gulf of Batabanó), Recalo, Strombus, and Maternillo beaches (Sabana-Camagüey Archipelago), north of Artemisa and Mayabeque provinces, and Jardines de la Reina Archipelago (south-east of Cuba).

REMARKS

The species used to be present in the eastern Atlantic (Madeira, the Gulf of Guinea, Cape Verde, Canary and Annabón Island) under the name *Diadema* aff. *antillarum*. Now, populations of the eastern Atlantic belong to the new

species *Diadema africanum* (Rodríguez *et al.*, 2013), and this change restricted the distribution of *D. antillarum* only for the western Atlantic.

Order ARBACIOIDA Gregory, 1900

Family ARBACIIDAE Gray, 1855

Genus *Arbacia* Gray, 1835

Arbacia punctulata (Lamarck, 1816)

HABITAT

The purple sea urchin (common name) occurs in seagrass beds of the turtle grass, but also on coral reefs, rocky, rubble, sandy, or shelly bottoms (Hendler *et al.*, 1995; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 0 to 225 m, but the species is most common in less than 50 m (Serafy, 1979; Solís-Marín *et al.*, 2013).

DISTRIBUTION

It occurs in shallow water from Massachusetts to Cuba, Bahamas, Yucatan Peninsula and the Gulf of Mexico, from Panama to French Guiana, the Lesser Antilles, and the north of Barbados (Serafy, 1979; Hendler *et al.*, 1995; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

North coast of Pinar del Río, Cabañas Bay and Hicacos Peninsula (Abreu *et al.*, 2000; Del Valle *et al.*, 2005).

Genus *Podocidaris* A. Agassiz, 1869

Podocidaris sculpta A. Agassiz, 1869

HABITAT

Occurs under rocks, coral reefs, muddy, or sandy bottoms (Espinosa *et al.*, 1997; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 8 to 780 m (Solís-Marín *et al.*, 2013).

DISTRIBUTION

They are distributed around the world in the western Atlantic including the Caribbean Sea, the Gulf of Mexico, Florida, Colombia, Cuba and European waters (Hansson, 2001; Miloslavich *et al.*, 2010; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Cove San Lázaro and El Chivo Beach, both sites in the western part of the Havana Bay (Espinosa *et al.*, 1997; Del Valle *et al.*, 2005).

Family TOXOPNEUSTIDAE Troschel, 1872

Genus *Lytechinus* A. Agassiz, 1863

Lytechinus variegatus variegatus (Lamarck, 1816)

HABITAT

Common in low-wave action zones, particularly in seagrass meadows, rocky bottoms under rocks, rubble, coral reefs, or muddy substrates (Serafy, 1979; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 0 to 580 m, but it is most common in waters no deeper than 50 m (Serafy, 1979; Solís-Marín *et al.*, 2013).

DISTRIBUTION

Beaufort, North Carolina, southward throughout the Caribbean to Santos, Brazil. Also occurs in Bermudas, Gulf of Mexico, Central America: Belize, Guatemala, Honduras, Salvador, Costa Rica and Panama (Serafy, 1979; Hendler *et al.*, 1995; Laguarda-Figueras *et al.*, 2005; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Off Havana coast, Siguanea Bay (Isle of Youth), Matanzas and Cárdenas bays, Ensenada de Santa Lucía, Beach Recalo (north of Confitas Key). Las Morlas (Hicacos Peninsula), Carahatas Bay, Iguana and Pajonal Keys, Nuevitas Bay, Conuco, Ratón, Fragoso and Guillermo Keys (Sabana-Camagüey Archipelago), Diego Pérez, Cantiles, and Juan García Keys (Gulf of Batabanó) and Santa Clara Bay (Del Valle *et al.*, 2005).

Lytechinus variegatus carolinus A. Agassiz, 1863

HABITAT

Common in rubble, seagrass beds, sandy and muddy bottoms (Serafy, 1979; Hendler *et al.*, 1995; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 0 to 250 m (Solís-Marín *et al.*, 2013).

DISTRIBUTION

From Cape Hatteras in North Carolina, south of Florida, Gulf of Mexico, Cuba (Serafy, 1979).

CUBAN LOCALITIES

In front of the Institute of Oceanography (Playa), Alamar neighbourhood (East Havana), and close to the mouth of the River El mosquito, all three sites off Havana (Espinosa *et al.*, 1997; Abreu *et al.*, 2000; Del Valle *et al.*, 2005).

Lytechinus williamsi Chesher, 1968

HABITAT

Occurs in rocky areas, under rubbles, sandy bottoms, or on exposed surfaces of corals from the genera *Millepora* or *Agaricia* spp. (Hendler *et al.*, 1995; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 3 to 256 m (Serafy, 1979; Solís-Marín *et al.*, 2013).

DISTRIBUTION

Dry Tortugas and the Florida Keys, Gulf of Mexico, Belize, Colombia, Cuba, Dominican Republic, Haiti, Panama, and Colombia (Hendler *et al.*, 1995; Herrera-Moreno & Betancourt, 2004; Alvarado *et al.*, 2008; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Punta Seboruco in Jardines de la Reina Archipelago (Abreu-Pérez & Del Valle, 1998).

Genus *Tripneustes* L. Agassiz, 1841

Tripneustes ventricosus (Lamarck, 1816)

HABITAT

Common in sand bottoms of seagrass meadows (Hendler *et al.*, 1995), but also in back reef zones where wave exposure is low (personal observation).

DEPTH RANGE

From 0 to 842 m (Solís-Marín *et al.*, 2013), but it is more common in less than 15 m (Serafy, 1979).

DISTRIBUTION

Florida, Bermudas south to Brazil. Cuba, Dominican Republic, Jamaica, Haiti, Puerto Rico, Belize, Honduras, Salvador, Costa Rica, and Panama. Also off West Africa, Ascension, Fernando de Noronha, and Trinidad Islands (Serafy, 1979; Hendler *et al.*, 1995; Herrera-Moreno & Betancourt, 2004; Durán-González *et al.*, 2005; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009).

CUBAN LOCALITIES

Off Havana, Diego Pérez and Cantiles Keys, Punta del Este (Isle of Youth), Los Canarreos Archipelago (Gulf of Batabanó), Girón Beach (south of Matanzas), Recalo, Santa Lucia, Strombus, and Maternillo beaches, west of Guajaba Key, and the north of Boca Chica, Flores, Santa María, Media Luna, north of Artemisa and Mayabeque Provinces, and Fragooso Keys in Sabana-Camagüey Archipelago (Arango & Molina, 1877; Suárez, 1974; Del Valle *et al.*, 2005).

Order ECHINOIDA Troschal, 1872

Family ECHINOMETRIDAE Gray, 1825

Genus *Echinometra* Gray, 1825

Echinometra lucunter lucunter (Linnaeus, 1758)

HABITAT

Common in intertidal zones, where the species occurs at high densities in small holes created by its erosive action in limestone rocks generally, but also in rocky patches within seagrass beds and reef crests.

DEPTH RANGE

From 0 to 45 m (Serafy, 1979).

DISTRIBUTION

Beaufort, from North Carolina and Bermudas throughout the Gulf of Mexico, southward throughout the Caribbean (Cuba, Dominican Republic, Haiti, Jamaica and Puerto Rico) and eastern Central America (Belize, Guatemala, Honduras, Nicaragua, Salvador, Costa Rica and Panama), Colombia, Venezuela, Surinam, the Lesser Antilles down to Desterra (Brazil), and West Africa (Serafy, 1979; Hendler *et al.*, 1995; Laguarda-Figueras *et al.*, 2005; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Guanahacabibes Peninsula, Ensenada de Corrientes (south of Pinar del Río), Las Morlas (south of Punta Hicacos), Matanzas Bay, Girón Beach, Punta del Este (Isle of Youth), Cantiles Key (Gulf of Batabanó), off Havana, north of Artemisa and Mayabeque provinces, and Sabana-Camagüey Archipelago (Arango & Molina, 1877; Del Valle *et al.*, 2005).

Echinometra viridis A. Agassiz, 1863

HABITAT

Coral reefs and other rocky areas, crevices, under rubble, on blanching corals, or in sandy areas associated with shell or rocky patches, and associated with mangrove keys (Hendler *et al.*, 1995).

DEPTH RANGE

From 0 to 40 m (Serafy, 1979).

DISTRIBUTION

From southern Florida throughout the Gulf of Mexico, Lesser and Greater Antilles, Central America (Belize, Guatemala, Honduras, Costa Rica and Panama), and throughout the West Indies to Venezuela (Hendler *et al.*, 1995; Laguarda-Figueras *et al.*, 2005; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Canales de Barlovento, Canarreos Archipelago (Gulf of Batabanó), off Havana, north of Artemisa and Mayabeque Provinces, Isle of Youth, south of Hicacos Peninsula, Girón and Larga beaches, Cochin Bay (south of Matanzas), Jururú Beach (north of Holguín), and Sabana-Camagüey Archipelago (Del Valle *et al.*, 2005).

Order HOLECTYPOIDA Duncan, 1889

Family ECHINONEIDAE Agassiz & Désor, 1847

Genus *Echinoneus* van Phelsum, 1774

Echinoneus cyclostomus Leske, 1778

HABITAT

Usually under rock slabs or fragments of coral rubble, sandy bottoms, seagrass beds, muddy substrates, coral reefs, and in coarse substrates with or without vegetation (Hendler *et al.*, 1995; Solís-Marín *et al.*, 2013).

DEPTH RANGE

It is most common in shallow waters from 0.5 m up to 585 m (Serafy, 1979; Solís-Marín *et al.*, 2013).

DISTRIBUTION

Occurs throughout the tropics of the world (Hendler *et al.*, 1995). It has been reported for the Gulf of Mexico, Central America (Belize, Honduras, Costa Rica and Panama), the Greater (Cuba, Dominican Republic and Puerto Rico), and the Lesser Antilles (Serafy, 1979; Hendler *et al.*, 1995; Abreu *et al.*, 2000; Herrera-Moreno *et al.*, 2004; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Rodríguez-Barreras *et al.*, 2012; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

La Francesita Beach, on north-west coast of Havana (Del Valle *et al.*, 2005).

Order CLYPEASTEROIDA A. Agassiz, 1872

Family CLYPEASTERIDAE L. Agassiz, 1835

Genus *Clypeaster* Lamarck, 1801

Clypeaster rosaceus (Linnaeus, 1758)

HABITAT

In turtle grass beds, or sand fields bordering turtle grass beds (Hendler *et al.*, 2005).

DEPTH RANGE

From 0 to 285 m, but it is most common in shallow waters (Serafy, 1979).

DISTRIBUTION

From South Carolina up to Barbados, Gulf of Mexico, Greater Antilles (Cuba, Jamaica, Dominican Republic and Puerto Rico), Central America (Belize and Panama), Colombia, Venezuela (Serafy, 1979; Hendler *et al.*, 1995; Borrero-Pérez *et al.*, 2002; Herrera-Moreno & Betancourt, 2004; Laguarda-Figueras *et al.*, 2005; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Solís-Marín *et al.* 2013).

CUBAN LOCALITIES

Guanahacabibes Peninsula, Diego Pérez Lagoon, Punta del Este (Isle of Youth), Cabañas Bay (Pinar del Río), off Havana, north coast of Artemisa and Mayabeque Provinces, Las Morlas, Hicacos Peninsula, Recalo, Santa Lucía, Strombus, and Maternillo beaches, north of La Tortuguilla, west of Guajaba Key, north of Confitas Key, Santa Clara Bay, Fragoso Key, east of Santa María Key, north of Flores Key, Media Luna, and Guillermo Keys in Sabana Camagüey Archipelago (Suárez, 1974; Del Valle *et al.*, 2005).

Clypeaster subdepressus (Gray, 1825)

HABITAT

Shallow areas of sand fields, shelly sediment, with little or no seagrass meadows, but also in muddy bottoms, seagrass meadows, or under rubbles (Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 1 to 50 m (Hendler *et al.*, 1995). This depth range was increased up to 210 m; however, this new limit (210 m) has been refused by Hopkins (1988).

DISTRIBUTION

North Carolina, south of Florida through the Caribbean, Central America (Belize, Honduras and Panama) up to Río de Janeiro, Brazil, Cuba, Puerto Rico, and Dominican Republic (Serafy, 1979; Hendler *et al.*, 1995; Herrera-Moreno & Betancourt, 2004; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Rodríguez-Barreras *et al.*, 2013; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Off Havana and off Banes in the north-east part of Cuba (Suárez, 1974; Abreu *et al.*, 2000).

Family MELLITIDAE Stefanini, 1911

Genus *Encope* L. Agassiz, 1840

Encope michelini L. Agassiz, 1841

HABITAT

Occurs in fine to coarse sand with little or no seagrass beds or filamentous algae (Hendler *et al.*, 1995).

DEPTH RANGE

From 0 to 240 m (Phelan, 1972; Solís-Marín *et al.*, 2013).

DISTRIBUTION

North Carolina, south of Florida, Gulf of México, Cozumel, and Cuba (Hendler *et al.*, 1995; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Undetermined specific sites according to Del Valle *et al.* (2005).

Genus *Leodia* Gray, 1852

Leodia sexiesperforata (Leske, 1778)

HABITAT

Usually buried in sand bottoms with little seagrass or filamentous algae (Hendler *et al.*, 1995), but also in rubble substrates (Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 0 to 180 m, but it is more common in areas no deeper than 25 m (Serafy, 1979; Solís-Marín *et al.*, 2013).

DISTRIBUTION

Cape Hatteras, North Carolina, Bermudas, southward around the tip of Florida into the south-eastern Gulf of Mexico as far north as Sanibel Island, the Yucatan Peninsula, Central America (Belize, Honduras, El Salvador, Costa Rica and Panama), the Greater Antilles (Cuba, Puerto Rico and Dominican Republic), the Lesser Antilles, and from the coast of northern South America to Uruguay (Serafy, 1979; Hendler *et al.*, 1995; Herrera-Moreno & Betancourt, 2004; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Rodríguez-Barreras *et al.*, 2013; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

The 'Thelman', Travieso, and Dios Keys, Punta del Este (Isle of Youth), Matanzas Bay, Hicacos Peninsula, Strombus, Maternillo Keys, the north coast of La Tortuguilla, and Santa María in Sabana-Camagüey Archipelago (Arango & Molina, 1877; Corvea *et al.*, 1990; Abreu *et al.*, 2000; Del Valle *et al.*, 2005).

Genus *Mellita* L. Agassiz, 1841

Mellita quinquesperforata (Leske, 1778)

HABITAT

Shallow waters siliceous sediments, in zones of high wave action, but also in muddy bottoms or rubble (Hendler *et al.*, 1995; Solís-Marín *et al.*, 2003).

DEPTH RANGE

From 0 to 180 m (Pawson *et al.*, 2009; Solís-Marín *et al.* 2013).

DISTRIBUTION

From Cape Cod, to Florida, the Gulf of Mexico, east coast of Mexico, the Greater and Lesser Antilles (Cuba, Dominican Republic, Puerto Rico and Jamaica), the Central American (Honduras, Nicaragua, Costa Rica and Panama), and South American coast to São Paulo, Brazil (Serafy, 1979; Hendler *et al.*, 1995; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Rodríguez-Barreras *et al.*, 2013; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Matanzas and Santa Clara Bays, north of Camagüey (Arango & Molina, 1877; Suárez, 1974; Corvea *et al.*, 1990; Abreu *et al.*, 2000; Del Valle *et al.*, 2005).

Order SPATANGOIDA Claus, 1876

Family BRISSIDAE Gray, 1855

Genus *Brissus* Gray, 1825

Brissus unicolor (Leske, 1778)

HABITAT

Under rocks or buried in sandy, rocky or muddy bottoms (Kier & Grant, 1965; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 0 to 250 m (Hendler *et al.*, 1995; Solís-Marín *et al.*, 2013).

DISTRIBUTION

Bermudas, Florida, the Gulf of Mexico, Greater (Cuba, Puerto Rico and Dominican Republic) and Lesser Antilles, Central America (Belize, Honduras, Costa Rica and Panama), and throughout the Caribbean to Brazil. In addition, the species occurs in the Mediterranean Sea, the Adriatic Sea, Cape Verde Islands, and the Azores (Hendler *et al.*, 1995; Herrera-Moreno & Betancourt, 2004; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Rodríguez-Barreras *et al.*, 2013; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Off Havana, La Bajada (south-west of Cuba), and Santa Clara Bay (Pérez-Farfante, 1959; Abreu *et al.*, 2000).

Genus *Meoma* Gray, 1851

Meoma ventricosa ventricosa (Lamarck, 1816)

HABITAT

Occurs in areas of coarse sand and shell fragments, associated with turtle grass beds or patch reef, in deep water sandy bottoms, or pockets on reef flats, muddy bottoms, or rubble substrates (Hendler *et al.*, 1995; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 0.3 to 293 m (Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

DISTRIBUTION

Fort Lauderdale, Florida, Bahamas, the Gulf of Mexico, east coast of Mexico, Central America (Belize, Guatemala, Honduras, Nicaragua, Costa Rica and Panama), the Greater (Cuba, Puerto Rico and Dominican Republic), the Lesser Antilles, and the River Orinoco which is considered the southern limit (Hendler *et al.*, 1995; Borrero-Pérez *et al.*, 2002; Herrera-Moreno & Betancourt, 2004; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Rodríguez-Barreras *et al.*, 2013; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Punta del Este (Isle of Youth), Diego Pérez, Cantiles, and Juan García Keys (Gulf of Batabanó), Strombus, and Maternillo Keys, north of la Tortuguilla, west of Guajaba Key, north of Confites Key, and Media Luna, and Guillermo Keys in Sabana-Camagüey Archipelago (Suárez, 1974; Corvea *et al.*, 1990; Abreu *et al.*, 2000; Del Valle *et al.*, 2005).

Genus *Plagiobrissus* Pomel, 1883

Plagiobrissus grandis (Gmelin, 1788)

HABITAT

Occurs in sandy areas whereas seagrass and algae are little abundant or absent (Hendler *et al.*, 1995).

DEPTH RANGE

From 1 to 210 m (Serafy, 1979).

DISTRIBUTION

Florida, the Gulf of Mexico, southward through the Caribbean, Central America (Belize and Panama), Greater (Cuba, Puerto Rico and Dominican Republic), Lesser Antilles, to South American coast to São Paulo, Brazil (Hendler *et al.*, 1995; Abreu *et al.*, 2000; Herrera-Moreno & Betancourt, 2004; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

Off Havana (Del Valle *et al.*, 2005).

Family SCHIZASTERIDAE Lambert, 1905

Genus *Moiria* (Lamarck, 1816)

Moiria atropos clotho Michelin, 1855

HABITAT

On muddy, rocky, mud-sand, and sandy substrates (Hendler *et al.*, 1995; Solís-Marín *et al.*, 2013).

DEPTH RANGE

From 0 to 445 m, but the species is most common in shallow water no deeper than 50 m (Serafy, 1979; Hendler *et al.*, 1995).

DISTRIBUTION

Cape Hatteras, Bermudas, Gulf of Mexico, Greater Antilles (Cuba, Dominican Republic and Puerto Rico), Central America (Belize, Honduras and Panama), southward throughout the Caribbean to São Paulo in Brazil (Serafy, 1979; Espinosa *et al.*, 1997; Herrera-Moreno & Betancourt, 2004; Benavides-Serrato, 2006; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Solís-Marín *et al.*, 2013).

CUBAN LOCALITIES

West of Levisa Key, Cárdenas Bay, Jururú Bay, and the south coast of the former Oriente region (Pérez-Farfante, 1959; Suárez, 1974; Espinosa *et al.*, 1997; Abreu *et al.*, 2000).

Genus *Schizaster* L. Agassiz, 1835

Schizaster floridiensis (Kier & Grant, 1965)

HABITAT

Inhabits burrows in mud or sand bottoms, and coral reefs (Hendler *et al.*, 1995).

DEPTH RANGE

Established between 12 to 65 m according to Solís-Marín *et al.* (2013), but Rodríguez-Barreras *et al.* (2007) found one test at 10 m.

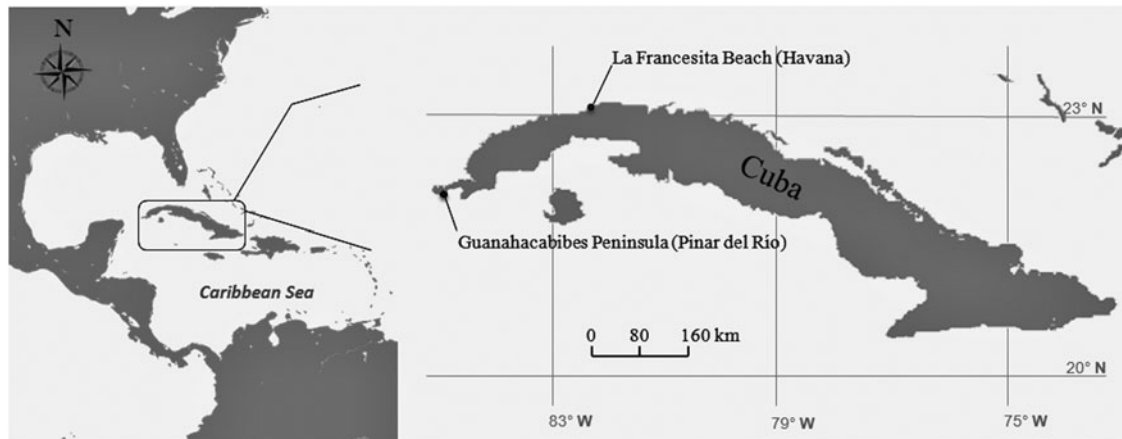


Fig. 1. Sites where the sea urchin *Schizaster floridiensis* has been collected in Cuba.

DISTRIBUTION

The Bahamas, Belize, Dominica, Florida Keys, Greater Antilles (Dominican Republic and Puerto Rico), Central America (Honduras and Panama), Venezuela, Dominica, and northern Brazil (Hendler *et al.*, 1995; Alvarado *et al.*, 2008; Pawson *et al.*, 2009; Rodríguez-Barreras *et al.*, 2013).

CUBAN LOCALITIES

North coast of Guanahacabibes (Pinar del Río), and off Havana (Rodríguez-Barreras *et al.*, 2007).

DISCUSSION

The present list reviews the Cuban shallow-water sea urchins and updates the existing knowledge with the addition of *Schizaster doederleini*. Furthermore, a new depth range is proposed for *Schizaster doederleini* and *Astropyga magnifica* that start now at 10 m and 2 m respectively. On the other hand, Rodríguez-Barreras *et al.* (2007) reported the occurrence of *Paraster doederleini*, now *Schizaster doederleini* (Chesher, 1972). Two intact tests were found in the western region of Cuba (Figure 1), and deposited in the collection of the National Aquarium of Cuba under the codes ANC-10.3.001 and ANC-10.3.002. Both tests were initially identified as *Paraster doederleini*. Nevertheless, a recent detailed reanalysis of the morphological features and dimensions of the tests concluded that in fact, both tests belong to *Schizaster floridiensis*. Therefore, *P. doederleini* should be removed from the Cuban list, whereas *S. floridiensis* should be added as a new record for the island.

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