Check List the journal of biodiversity data

LISTS OF SPECIES

Check List 11(2): 1601, March 2015 doi: http://dx.doi.org/10.15560/11.2.1601
ISSN 1809-127X

List of marine crabs (Decapoda: Anomura and Brachyura) of shallow littoral of Santiago de Cuba, Cuba

Yander Luis Diez García[1, 2*] and **Abdiel Jover Capote**[2]

1 Santiago de Cuba Port Authority, Alameda Business Center, Ave. Jesús Menéndez s/n, CP 90100, e/ Jagüey and Enramadas, Santiago de Cuba, Cuba
2 Biology Department, Natural Science Faculty, Universidad de Oriente, Ave. Patricio Lumumba s/n, CP 90500, Santiago de Cuba, Cuba
* Corresponding author. E-mail: yander.diez@cnt.uo.edu.cu, yanderluis87@gmail.com

Abstract: Marine crustaceans constitute one of the best studied groups in the Cuban waters. However, the level of systematic knowledge about them differs among the ecoregions of the platform. This paper presents the systematic list of hermit, porcelain and brachyuran crabs of the coast of Santiago de Cuba, on the southeast platform of Cuba. The records of the species have been compiled between 2009 and 2013, in ten locations, which differ in the type of habitats. Additional material was examined in the collection of the Universidad de Oriente Museum Charles Ramsdem. Eighty-one species are represented (seven hermits, eight porcelains and sixty-six true crabs). Data on their local and global distribution, their habitat, and notes on their reproductive period and fishing use are also provided.

Key words: marine biodiversity, crustaceans, Caribbean Sea, fishery, platform

INTRODUCTION

Cuban crustaceans have been studied since the 19th century and are one of the best known marine invertebrate groups in the country (Varela et al. 2003). Despite this statement, there are significant differences in the level of knowledge of the same group in different regions of the Cuban platform. Especially in the east coast, like with most marine zoological groups in this region, little is known about its composition. The carcinology of the central and western region of the island is best known through studies of Martínez-Iglesias and Gómez (1986), Ortiz (2001) and Lalana et al. (2007).

The marine coastal area of Santiago de Cuba is very diverse and includes bays, beaches, estuaries, rocky shores, islets and reefs, as well as wetlands and grass (Gómez et al. 2001). The presence of a large terrace karst implies the existence of abrasive coasts with exposed beaches. The main activities throughout the coastal strip are fishing (commercial, recreational or subsistence) as well as tourism. Thereare also port activities and water sports in Santiago de Cuba Bay, the main geographical accident of this shoreline (Gómez et al. 2009; Diez et al. 2013).

The most current systematic list of decapods collected in Cuban waters was compiled by Lalana and Ortiz (2000), who also account the bibliography that place each species in the Cuban shelf. To date only two carcinological studies are known in Santiago de Cuba, the first refers to the portunids genus *Callinectes* Stimpson, 1860 (Gómez et al. 2009) and the second the distribution of porcellains crabs (Diez and Jover 2013). The current research aims to present a complete list of marine crabs in this region.

MATERIALS AND METHODS

Material from numerous sampling locations collected between 2009 and 2013 in the coastal zone of Santiago de Cuba was analyzed. The sampling locations include Buey Cabón, Mar Verde, Santiago de Cuba Bay, Aguadores, Sardinero, Juticí, Siboney, Juraguá, Verraco and Baconao (Figure 1). In addition, material of the carcinogical collection of Universidad de Oriente Museum Charles Ramsdem de la Torre (MChR) was analyzed.

Direct and indirect sampling were conducted on different biotopes (e.g., supra and intertidal rocky, sandy, muddy, coral hillocks, angiosperms prairies, and mangroves) in the supralittoral zone were also sampled down to 3 m depth. Estuarine and semi-terrestrial species are included in the list because larval stages occur in the sea (Ortiz 2001).

The specific list of porcelain crabs presented here followed Diez and Jover (2013) with an update, and species of portunid crabs followed Gómez et al. (2009). All lists of species presented here followed specialized literature (e.g., Powers 1977; Williams 1984; Abele and Kim 1986; Juarrero and Ortiz 2003; Osawa and McLaughlin 2010).

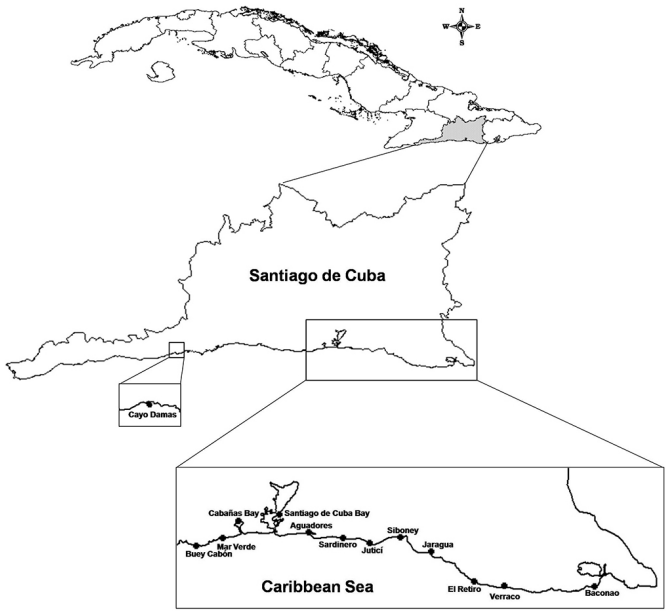

Figure 1. Map of the study locations, including the references in the literature and collection. Cayo Damas (19°58′7.48″N; 076°24′10.84″W), Buey Cabón (19°57′20.68″N; 075°58′21.74″W), Mar Verde (19°57′32.72″N; 075°57′23.34″W), Cabañas Bay (19°59′5.64″N; 075°56′3.71″W), Santiago de Cuba Bay (19°58′00″N; 072°52′00″W), Aguadores (19°57′51.5″N; 075°49′47.2″W), Sardinero (19°57′34.59″N; 075°47′00.92″W), Juticí (19°56′59.45″N; 075°45′08.77″W), Siboney (19°57′32″N; 075°42′15″W), Juraguá (19°57′32″N; 75°42′15″W), El Retiro (19°54′1.99″N; 075°36′58.75″W), Verraco (19°53′34″N; 075°34′47″W), and Baconao (19°53′55″N; 075°27′10″W).

Data on geographical distribution of species, habitat, food, reproductive period, and fishing use were added using criteria from literature (Rodríguez 1980; Gore 1982, 1983; Lira et al. 2001; Werding et al. 2003; Gómez et al. 2009) or field observations. Collected material was deposited in the MChR and Tomás Romay Museum, Santiago de Cuba. The systematic list of Brachyura followed Ng et al. (2008) and the family Mithracidae is actualized by Windsor and Felder (2014). The genus *Portunus* Weber, 1795 and *Achelous* de Haan, 1833 are actualized by Mantelatto et al. (2009).

RESULTS

Catalog of species

Order Decapoda Latreille, 1802
Suborder Pleocynemata Burkenroad, 1963
Infraorder Anomura MacLeay, 1838
Superfamily Coenobitoidea Dana, 1851
Family Coenobitidae Dana, 1851
Genus *Coenobita* Herbst, 1791

Coenobita clypeatus Herbst, 1791 (Figures 2a–2c)

Examined material: Fifteen adult and juvenile specimens collected along the coast. Two specimens deposited in the MChR, one from from Cayo Damas, Chivirico (IC55) and other from Santiago de Cuba Bay (ICo2).

Geographic distribution: Florida, Bermuda, Cuba and the Greater Antilles, and Venezuela.

Habitat: This species has its reproductive and larval stages in the sea, but later is terrestrial. *Coenobita clypeatus* ranks the empty shells of gastropods or other objects, which serve as protection. It is also commonly found in leaf litter and shrubs near the coast, but reaches several kilometers inland.

Remarks: Many populations of this species are threatened by their preferred use as bait for fishing. Similarly, there is some consumption of soft parts of the animal and as medicinal use.

Family Diogenidae Ortmann, 1892
Genus *Calcinus* Dana, 1851

Calcinus tibicen (Herbst, 1791) (Figure 2d)

Examined material: Numerous specimens collected along all localities studied, except inside the bay.

Geographic distribution: Florida, Bermuda, from the Greater Antilles to Brazil, and along the coast of Cuba.

Habitat: Intertidal rocky shore and shallow sublittoral.

Genus *Clibanarius* Dana, 1852

Clibanarius antillensis Stimpson, 1862 (Figure 2e)

Examined material: Nine specimens collected in Aguadores and five in Santiago de Cuba Bay.

Geographic distribution: From Florida to Brazil, Cuba.

Habitat: Shallow sandy-rocky bottoms.

Clibanarius sclopetarius (Herbst, 1796) (Figure 2f)

Examined material: One specimen collected in Aguadores and three in Santiago de Cuba Bay.

Geographic distribution: Florida, and from the Greater Antilles to Brazil.

Habitat: Sandy-rocky bottoms, mangrove, in shallow waters.

Remarks: This species was cited previously to Cuba as *Clibanarius cubensis* (Saussure, 1858).

Clibanarius tricolor (Gibbes, 1850) (Figure 2g)

Examined material: Numerous specimens collected along the coast.

Geographic distribution: Florida, Bermuda, coast of Cuba and the Greater Antilles.

Habitat: Shallow rocky bottoms and *Thalassia testudinum* Banks ex König prairies.

Genus *Dardanus* Paulson, 1875

Dardanus venosus (H. Milne Edwards, 1848) (Figure 2h)

Examined material: One specimen collected in Aguadores (March 13, 2014).

Geographic distribution: Bermuda, Florida, and from Antilles to Brazil, Cuba.

Habitat: Rocky-sandy and corallines bottoms, shallow waters to 40 m.

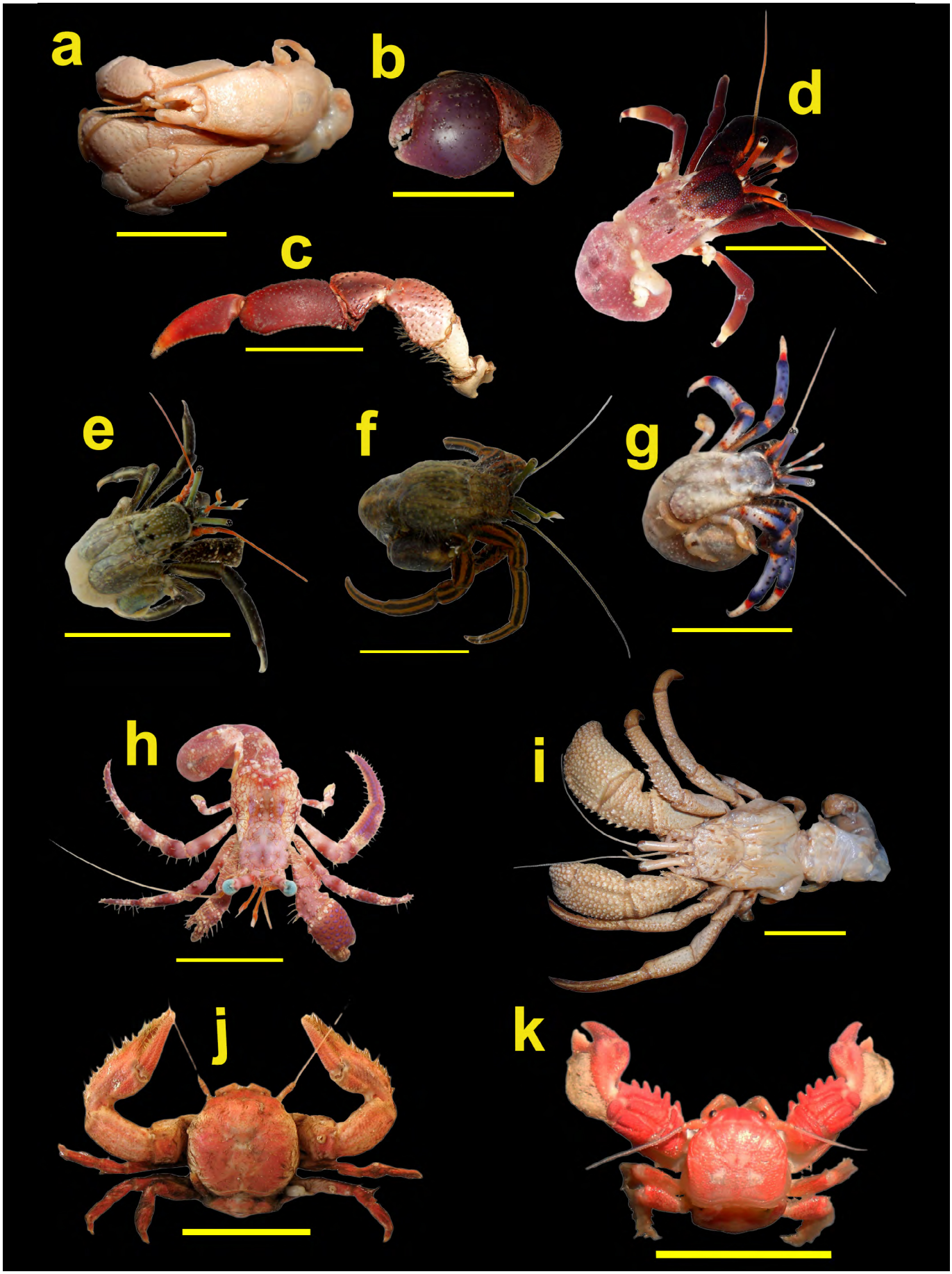

Figure 2. Anomurans (Coenobitidae, Diogenidae and Porcelanidae). **a–c**: *Coenobita clypeatus* (a: animal in dorsal view, b: major chaela and c: third leg), **d**: *Calcinus tibicen*, **e**: *Clibanarius antillensis*, **f**: *Clibanarius sclopetarius*, **g**: *Clibanarius tricolor*, **h**: *Dardanus venosus*, **i**: *Petrochirus diogenes*, **j**: *Megalobranchium poeyi*, and **k**: *Neopisosoma curaçaoense*. The color of the specimens is changed by the preservative solution. Each bar equals 1 cm.

Genus *Petrochirus* Stimpson, 1858

Petrochirus diogenes (Linnaeus, 1758) (Figure 2i)

Examined material: One young specimen from Cayo Damas, Chivirico, deposited in the MChR (IC58).

Geographic distribution: From Florida to Lesser Antilles, and Venezuela, Cuba.

Habitat: Sandy-muddy bottoms and *Thalassia* beds, at depths ranging from 18 to 92 m.

Superfamily Galatheoidea Samouelle, 1819
Family Porcellanidae Haworth, 1825
Genus *Megalobranchium* Stimpson, 1958

Megalobranchium poeyi (Guerin, 1855) (Figure 2j)

Examined material: Four males and two females from Aguadores and Santiago de Cuba Bay.

Geographic distribution: Cuba is the type locality. Western Atlantic, from Florida and Caribbean Sea to Brazil. Eastern Pacific, from Bahia Salinas in Costa Rica to Panama.

Habitat: Rocky bottoms (with detritus), mud and mangroves to 46 m deep.

Remarks: Ovigerous females were reported between the months of April and July.

Genus *Neopisosoma* Haig, 1960

Neopisosoma angustifrons (Benedict, 1901)

Geographic distribution: Southwestern Gulf of Mexico, West Indies (Trinidad, Cubagua, Turtle Islands, Bonaire, and Curaçao), Panama and Venezuela. In Cuba, the species is known only from Santiago de Cuba.

Habitat: Intertidal rocky shore, associated with macroalgae (*Valoniopsis pachynema* (Martens) Børgesen), to 1m deep.

Neopisosoma curacaoense(Schmitt, 1924) (Figure 2k)

Geographic distribution: Lesser Antilles. In Cuba, the species is known only from Santiago de Cuba and Boca de Canasí on the northwest coast (Barro et al. 2013).

Habitat: Intertidal rocky shore, associated with macroalgae (*Valoniopsis pachynema* (Martens) Børgesen), to 1m deep.

Genus *Petrolisthes* Stimpson, 1858

Petrolisthes armatus (Gibbes, 1850)

Examined material: Although Diez and Jover (2013) recognized that this species was no longer observed in the Socapa (Santiago de Cuba Bay), many specimens have been collected after the pier at Cayo Granma in the own bay. In addition four specimens deposited in the MChR (IC03).

Geographic distribution: West coast of Africa. Western Atlantic: Florida, Gulf of Mexico and from Antilles to Brazil, abundant along the coast of Cuba. Pacific: from Gulf of California to Peru.

Habitat: Sandy, muddy, rocky bottoms and mangroves, from the foreshore to 30 m deep. In the greatest depths, is common to find specimens associated with anemones.

Petrolisthes marginatus Stimpson, 1858

Geographic distribution: West coast of Africa. Western Atlantic: from Cuba to northern Brazil. To date the report of Diez and Jover (2013) forms the northern boundary of the distribution of the species and it is the first report in the Greater Antilles.

Habitat: Rocky bottoms, from the intertidal to 3 m depth.

Remarks: Ovigerous females are reported in the Americas region in the months of January and February and April to July.

Petrolisthes politus (Gray, 1831)

Geographic distribution: Florida, Gulf of Mexico, Cuba and from the rest of the Antilles to Venezuela, and Panama.

Habitat: Rocky bottoms, from the intertidal to 1 m depth.

Remarks: Ovigerous females found during the month of May in Juticí, Santiago de Cuba (the same was reported by Diez and Jover (2013)).

Petrolisthes quadratus Benedict, 1901

Geographic distribution: Florida, Bahamas, Cuba and from Antilles to the northern coast of South America.

Habitat: Rocky and sandy bottoms in the intertidal and very shallow sublittoral.

Remarks: Ovigerous females registered by Diez and Jover (2013) to the months of April and May.

Petrolisthes tridentatus Stimpson, 1859

Geographic distribution: Western Atlantic: Bahamas, Cuba and from Antilles to the northern coast of South America (Venezuela). Eastern Pacific: from Nicaragua to Ecuador.

Habitat: Rocky and sandy bottoms in the intertidal and sublittoral to 1 m depth.

Remarks: Ovigerous females were found from February to June in the Atlantic region.

Infraorder Brachyura Latreille, 1803
Section Eubrachyura Saint Laurent, 1980
Subsection Heterotremata Guinot, 1977
Superfamily Aethroidea Dana, 1851
Family Aethridae Dana, 1851
Genus *Hepatus* Latreille, 1802

Hepatus pudibundus (Herbst, 1785) (Figure 3a)

Examined material: Many males and females from Santiago de Cuba Bay deposited in the MChR (IC29).

Geographic distribution: Eastern Atlantic: Africa. Western Atlantic: from Gulf of Mexico to Santa Catarina (Brazil), Great and Lesser Antilles, north and south coast of Cuba.

Habitat: Muddy and sandy-muddy bottoms, shallow waters to 49 m. Commonly with anemones and cirripedies on the carapace.

Remarks: Holthuis (1959) reports ovigerous females from Suriname in April. Lalana et al. (2004) reported specimens of this specie from Cuba, collected by the "Atlantis Expedition", as *H. princeps* (Herbst, 1784), however *H. princeps* is synonym junior of *H. pudibundus* (Ng et al. 2008).

Superfamily Calappoidea de Haan, 1833
Family Calappidae de Hann, 1833
Genus *Calappa* Weber, 1795

Calappa flammea (Herbst, 1794) (Figure 3b)

Examined material: A specimen collected at the mouth of the river at Buey Cabón.

Geographic distribution: From Massachusetts to Florida Keys, Gulf of Mexico, Bahamas and Bermuda, along the coast of Cuba.

Habitat: Hard and sandy bottoms, from shallow waters to 73 m depth, rarely 229 m, river mouths and estuaries.

Calappa gallus (Herbst, 1803) (Figure 3c)

Examined material: Three specimens collected on the coast between Verraco and Baconao beach. A male from Siboney deposited in the MChR (IC09).

Geographic distribution: American Atlantic: Bermuda, Bahamas, Florida Keys and Dry Tortugas, Jamaica, Puerto Rico, from St. Croix to Barbados Campeche Bank, from Panama to Venezuela, Netherlands Antilles, from Ceará to Bahia (Brazil), St. Helena Island, western Cuba. African Atlantic: from Senegal to Angola, South Africa. Red Sea. Persian Gulf: Reunion and Seychelles. Pacific: India and Maldives, the Philippines, Formosa, Japan, Marshall Islands, Samoa, Hawaii Islands.

Habitat: Hard, rocky and sandy bottoms, middens and reefs, from the tide line to 218 m depth.

Genus *Cryptosoma* Brullé, 1837

Cryptosoma vairdii (Stimpson, 1860) (Figure 3d)

Examined material: A male from Siboney, collected on March 20, 2014.

Geographic distribution: Western Atlantic: Bermuda, from North Carolina to Espirito Santo (Brazil), Cuba. Eastern Pacific: from Baja California to Ecuador and Galapagos Islands, including Clarion, Socorro, and Cocos Islands.

Habitat: Sandy and corallines bottoms, from shallow waters to 228 m depth.

Superfamily Eriphioidea MacLeay, 1838
Family Eriphidae MacLeay, 1838
Genus *Eriphia* Latreille, 1817

Eriphia gonagra (Fabricius, 1781) (Figures 3e–g)

Examined material: Nine specimens collected along the coast.

Geographic distribution: From North Carolina to the Patagonia, Argentina, through The Antilles and Cuba.

Habitat: Mesolittoral pools and shallow coral reefs, under rocks and between sponges and macroalgae.

Remarks: Ovigerous females have been observed in Florida and the Greater Antilles from March to September, in Santiago have been observed in February.

Family Menippidae Ortmann, 1893
Genus *Menippe* De Haan, 1833

Menippe mercenaria (Say, 1818) (Figure 3h)

Examined material: Six juveniles collected in La Socapa, Santiago de Cuba Bay (February 2014), a male from Cabañas Bay deposited in the MChR (IC38).

Geographic distribution: Bahamas, from North Carolina to Yucatán, Gulf of Mexico, Jamaica and Cuba (west and central south coast).

Habitat: Adult crabs burrow into the muddy bottoms, below the low tide line, reefs, under stones or in the coral reefs, shell deposits. Young specimens do not burrow, live in deep waters or mesolittoral, seagrass, under rocks. The species is well adapted to the range of salinity of estuaries and can survive from extremely low to greater than 35‰. It extends from shallow waters to 51 m depth.

Remarks: Species of high commercial value. The total catches recorded in the western Atlantic between 1984 and 1998 were 38,699 MT (an average production of 2,579 MT/year). Individuals caught with fishing gear (such as networks) or directly with hands, sold fresh. This species is considered Endangered by the IUCN.

Family Oziidae Dana, 1851
Genus *Ozius* H. Milne Edwards, 1834

Ozius reticulatus (Desbonne & Schramm, 1867) (Figure 3i)

Examined material: Five specimens collected in Juticí (April 2012).

Geographic distribution: Bahamas, Cuba and from the other Antilles to north coast of South America.

Habitat: Mesolittoral rocky shore to 20 m depth.

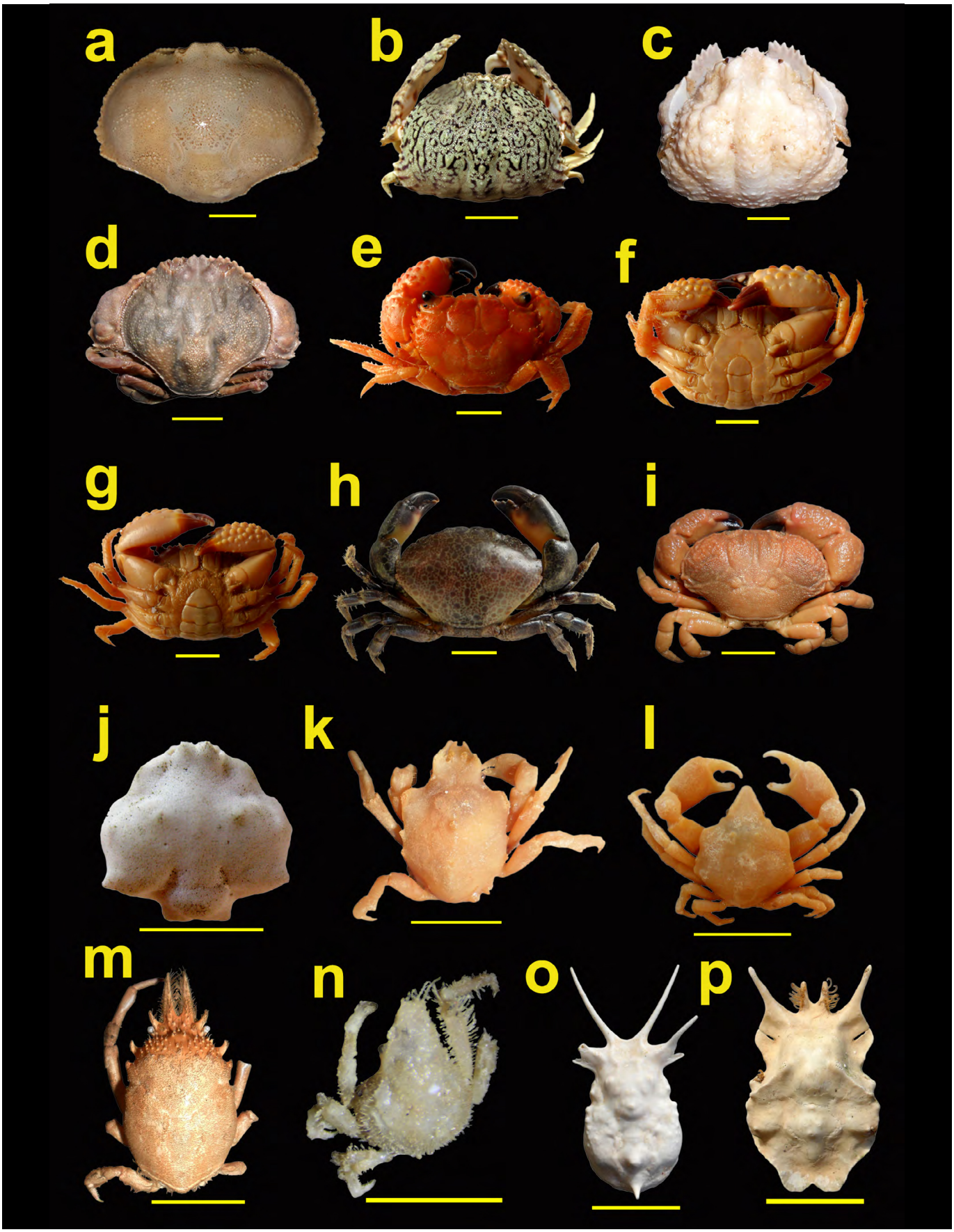

Figure 3. Brachyurans (Aethridae, Calappidae, Eriphidae, Menippidae, Oziidae, Leucosiidae and Epialtidae). **a**: *Hepatus pudibundus* (carapace), **b**: *Calappa flammea*, **c**: *Calappa gallus*, **d**: *Cryptosoma vairdii*, **e–f**: *Eriphia gonagra* (e: male in dorsal view, f: male in ventral view, and g: female in ventral view), **h**: *Menippe mercenaria* (juvenile), **i**: *Ozius reticulatus*, **j**: *Speloeophorus pontifer* (carapace), **k**: *Acanthonyx petiverii*, **l**: *Epialtus bituberculatus*, **m**: *Chorinus heros*, **n**: *Pelia mutica*, **o**: *Picroceroides tubularis* (carapace), and **p**: *Tyche emarginata* (carapace). The color of the specimens is changed by the preservative solution. Each bar equals 1 cm.

Superfamily Leucosioidea Samouelle, 1819
Family Leucosiidae Samouelle, 1819
Subfamily Ebalinae Stimpson, 1871
Genus *Speloeophorus* A. Milne Edwards, 1865

Speloeophorus pontifer (Stimpson, 1871) (Figure 3j)

Examined material: A specimen found dead in Siboney after the Hurricane Sandy (October 2012).

Geographic distribution: From North Carolina to west Florida, from Antilles to Barbados, and Cuba.

Habitat: Sandy, rocky and corallines bottoms, shallow waters to 229 m.

Superfamily Majoidea Samouelle, 1819
Family Epialtidae MacLeay, 1938
Subamily Epialtinae MacLeay, 1838
Genus *Acanthonyx* Latreille, 1825

Acanthonyx petiverii H. Milne Edwards, 1834 (Figure 3k)

Examined material: Two males and three females collected in the intertidal rocky shore, along the coast except in the bay.

Geographic distribution: Western Atlantic: Florida and from the West Indies to Rio de Janeiro, Brazil, Cuba. Eastern Pacific: from Baja California to Valparaiso, Chile, and Galapagos Islands.

Habitat: Tide pools, rocky shores, sand and coral bottoms. Intertidal rocky shore with strong waves, associated with macroalgae community (e.g., *Sargassum* sp. and *Turbinaria* sp.), to 29 m depth.

Genus *Epialtus* H. Milne Edwards, 1834

Epialtus bituberculatus H. Milne Edwards, 1834 (Figure 3l)

Examined material: Fifteen males and seventeen females collected in the intertidal rocky shore along the coast, except in inland waters of the bay.

Geographic distribution: Florida, Puerto Rico, Panama, Colombia, from Venezuela to Brazil. Cuba, south of Peninsula de Guanahacabibes (Antonio, El Resguardo and El Holandés beaches).

Habitat: Tide pools, found in logs drilled by borers, *Thalassia testudinum* Banks ex Köning prairies. *Epialtus bituberculatus* is common in the intertidal rocky shore subjected to strong waves and associated to macroalgal community (*Sargassum* spp., *Turbinaria* spp., *Valoniopsis pachinema* (Martens) Børgesen)). In Cuba, this species was found to 20 m depth.

Subfamily Pisinae Dana, 1851
Genus *Chorinus* Latreille, 1825

Chorinus heros (Herbst, 1790)

Examined material: One specimen collected in Mar Verde.

Geographic distribution: Bermuda, Florida, Yucatan, Greater Antilles to Venezuela and Brazil.

Habitat: Sandy, rocky and corallines bottoms, shallow waters to 50 m depth.

Genus *Pelia* Bell, 1935

Pelia mutica (Gibbes, 1850) (Figures 3m and 3n)

Examined material: One specimen collected in Santiago de Cuba Bay.

Geographic distribution: From Massachusetts to Florida, north cost to Cuba, Jamaica, Puerto Rico, St. Thomas, Virgin Islands.

Habitat: Sandy, muddy, rocky and corallines bottoms, associated with hydroids and sponges, shallow waters to 51 m depth.

Genus *Picroceroides* Miers, 1886

Picroceroides tubularis Miers, 1886 (Figure 3o)

Examined material: A specimen found dead in Siboney after the Hurricane Sandy (October 2012).

Geographic distribution: Bahamas, Florida, Antilles, north and south cost of Cuba, from Maranhão to Espírito Santo (Brazil).

Habitat: Rocky and corallines bottoms, shallow waters to 110 m depth.

Subfamily Tychinae Dana, 1851
Genus *Tyche* Bell, 1835

Tyche emarginata White, 1847 (Figure 3p)

Examined material: A male and a female were found dead in Siboney after the Hurricane Sandy (October 2012).

Geographic distribution: North Carolina, Bahamas, Florida, from the West Indies to Cape St. Roque, Brazil, south coast of Cuba.

Habitat: Rocky and shell bottoms, shallow waters to 36 m depth.

Family Inachidae MacLeay, 1938
Genus *Podochela* Stimpson, 1860

Podochela macrodera Stimpson, 1860 (Figure 4a)

Examined material: One male from Cayo Damas deposited in the MChR (IC63).

Geographic distribution: Bahamas, Florida, Greater and from Lesser Antilles to Brazil, Cuba.

Habitat: Sandy, rocky and coralline bottoms, on sponges, shallow waters to 53 m depth.

Genus *Stenorhynchus* Lamarck, 1818

Stenorhynchus seticornis (Herbst, 1788) (Figure 4b)

Examined material: Six specimens collected along the coast. The adults are always found in pairs on the

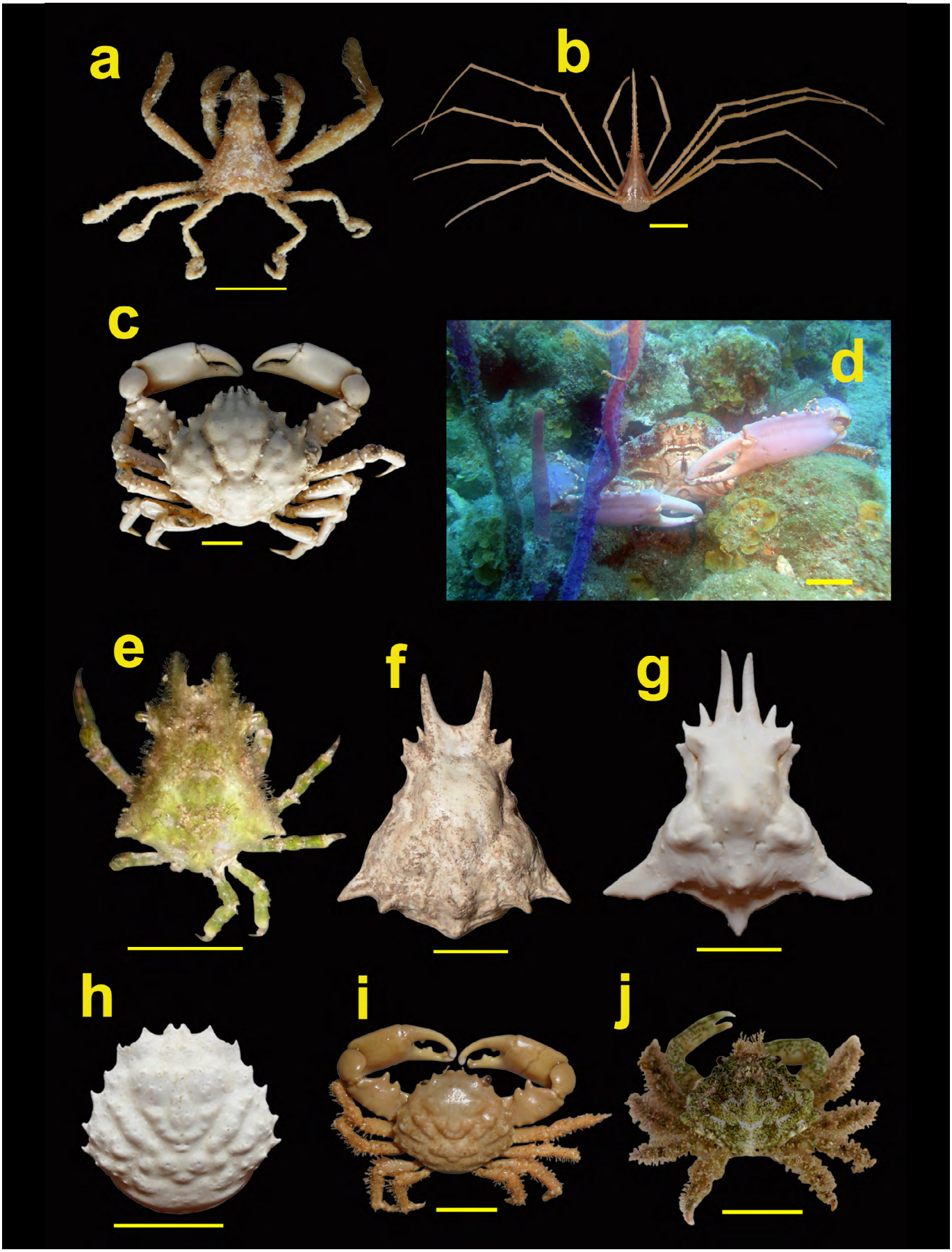

Figure 4. Brachyurans (Inachidae and Mithracidae). **a**: *Podochela macrodera*, **b**: *Stenorhynchus seticornis*, **c**: *Damithtax hispidus*, **d**: *Damithtax spinosissimus* (in a rocky bottom), **e–f**: *Macrocoeloma subparallelum* (e: juvenile specimen, and f: adult carapace), **g**: *Macrocoeloma trispinosum* (carapace), **h**: *Mithraculus cinctimanus* (carapace), **i**: *Mithraculus coryphe*, and **j**: *Mithraculus sculptus*. The color of the specimens is changed by the preservative solution. Each bar equals 1 cm.

sides and under large rocks. Deposited in the MChR: one male and one ovigerous female from El Níspero, Santiago de Cuba Bay (IC12) and three males and one female from this bay (IC34).

Geographic distribution: North Carolina, through the Antilles to Santa Catarina (Brazil), Bermuda. Well represented along the coast of Cuba.

Habitat: The species has been found on funds varied, rocky, coral fragments, sand and shells, both beaches and estuarine areas, from shallow waters to a maximum depth of 1,489 m.

Family Mithracidae MacLeay, 1938
Genus *Damithtax* Windsor & Felder, 2014

Damithtax hispidus (Herbst, 1790) (Figure 4c)

Examined material: Numerous specimens collected between Siboney and Baconao. A male from La Socapa, Santiago de Cuba Bay, and a juvenile from Cayo Damas, Chivirico, deposited in the MChR (IC27 and IC59, respectively).

Geographic distribution: From Antilles to the northern coast of South America, in Cuba is recorded from the central north coast to the southwest.

Habitat: Rocky and coral bottoms, from shallow waters to 33 m depth.

Damithtax spinosissimus (Lamarck, 1818) (Figure 4d)

Examined material: Two specimens collected in Aguadores and Baconao. According to local fishermens, this species is well represented along all the coast of Santiago de Cuba.

Geographic distribution: North Carolina and from Florida to Nicaragua, from Antilles to Barbados, north and south coast of Cuba.

Habitat: Sandy, rocky and coral bottoms, the species can be covered by barnacles, bryozoans, serpulid worms, and foraminifera, shallow waters to 179 m depth.

Remarks: This species is of interest to local fisheries, but not commercial, because of its large size reached.

Genus *Macrocoeloma* Miers, 1879

Macrocoeloma subparallelum (Stimpson, 1860) (Figures 4e and 4f)

Examined material: One female from Verraco, collected in April 2012, in a rocky bottom covered with seaweed.

Geographic distribution: From Antilles to Venezuela and Brazil, north and south coast of Cuba.

Habitat: Coral reefs, tidal pools, sandy bottoms with macroalgae and angiosperms, mesolittoral to 22 m depth.

Macrocoeloma trispinosum (Latreille, 1825) (Figure 4g)

Examined material: A specimen found died in Siboney after the Hurricane Sandy (October 2012).

Geographic distribution: From Beaufort North Carolina to Florida, Yucatan and from West Indies to Bahia (Brazil), west and north coast of Cuba.

Habitat: The species was found floating together with masses of *Sargassum* in oceanic waters, dredged in deep reefs, on mangrove roots, and in a variety of sandy-rocky bottoms. Usually found covered in sponges. From shallow waters to 82 m depth.

Remarks: Rathbun (1925) discusses the changes in *Macrocoeloma trispinosum* Latreille, 1825 based on their geographical distribution and morphology of the posterolateral projections of the carapace, tubercles and spines, among other characters. This study considered the subspecies *Macrocoeloma trispinosum trispinosum* Latreille, 1825, *M. trispinosum nodipes* (Desbonne, 1867) and a non-named variety (Rathbun variety), actually are considered the species *M. trispinosum* Latreille, 1825 and *M. nodipes* (Desbonne, 1867) (Ng et al. 2008).

Genus *Mithraculus* White, 1847

Mithraculus cinctimanus (Stimpson, 1860) (Figure 4h)

Examined material: Many specimen were found dead in Siboney after the Hurricane Sandy (October 2012).

Geographic distribution: Bahamas, Florida, the Antilles, and Cuba.

Habitat: Rocky and corallines bottoms, shallow waters to 20 m depth.

Mithraculus coryphe (Herbst, 1801) (Figure 4i)

Examined material: Seven specimens collected along the coast, except in the interior of the bay.

Geographic distribution: Bahamas, Florida, from the West Indies to São Paulo (Brazil), north and south coast of Cuba, from Panama to Colombia.

Habitat: Reefs, rocky, sandy, shell, angiosperm meadows, on sponges, shallow waters to 55 m depth.

Mithraculus sculptus (Lamarck, 1818) (Figure 4j)

Examined material: Seven specimens collected along the coast.

Geographic distribution: Bahamas, Florida, from the West Indies to Bahia (Brazil), north and south coast of Cuba.

Habitat: Coral reefs, under rocks, sandy, muddy, shell, angiosperm meadows, shallow waters to 55 m depth.

Genus *Mithrax* Latreille, 1817

Mithrax aculeatus (Herbst, 1790) (Figure 5a)

Examined material: Numerous specimens collected between Siboney and Baconao.

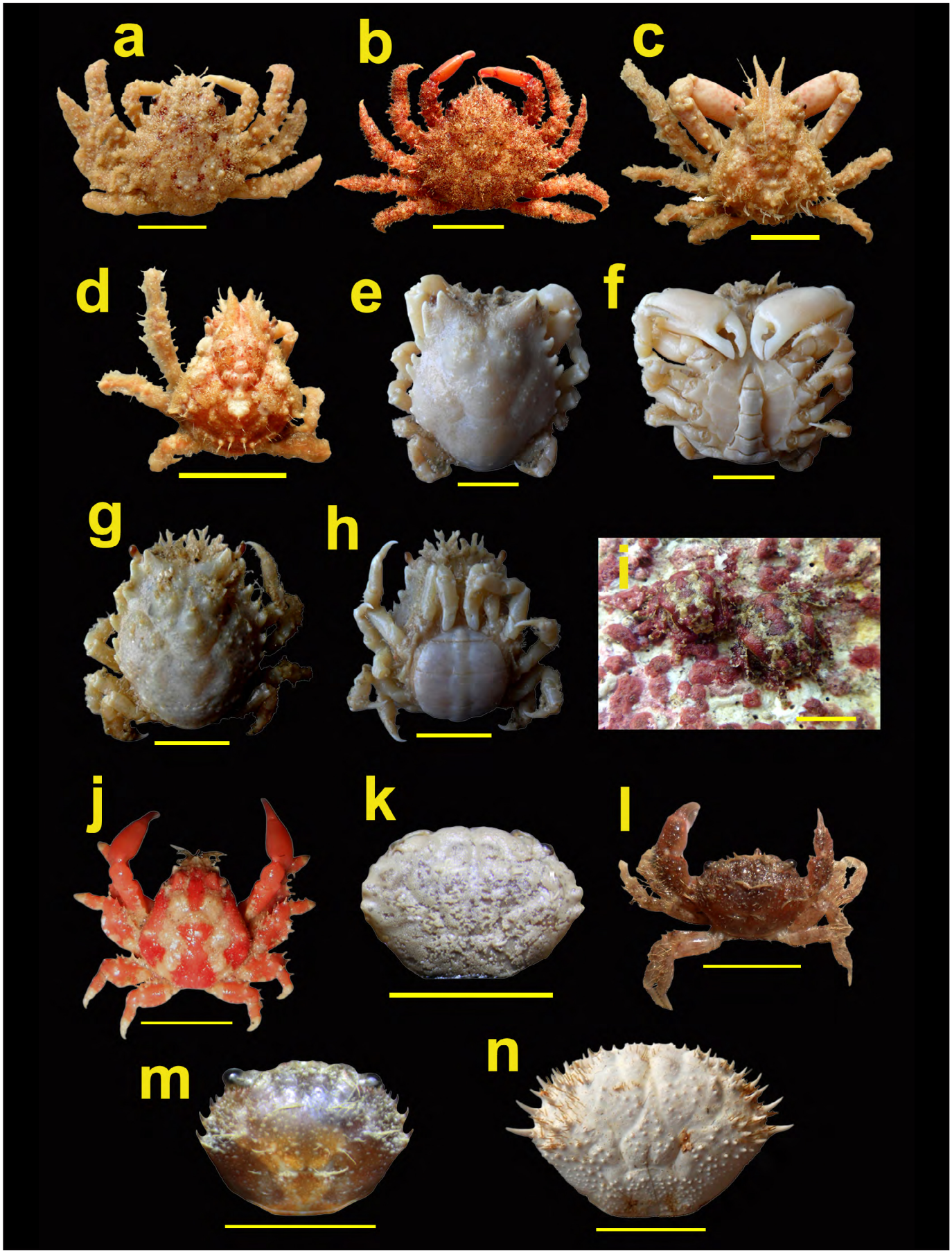

Figure 5. Brachyurans (Mithracidae and Pilumnidae). **a**: *Mithrax aculeatus*, **b**: *Mithrax verrucosus*, **c–d**: *Omalacantha bicornuta* (c: male, and d: female), **e–h**: *Pitho lherminieri* (e: male in dorsal view, f: male in ventral view, g: female in dorsal view, and h: female in ventral view), **i–j**: *Thoe puella* (i: a pair in typical habitat, note the camouflage, and j: animal), k: *Pilumnus floridanus* (carapace), **l–m**: *Pilumnus lacteus* (l: animal, and m: carapace), and **n**: *Pilumnus spinossisimus* (carapace). Each bar equals 1 cm.

Geographic distribution: Bahamas, Florida, Vera Cruz in Mexico, Antilles, from Caribbean Panama to Venezuela, north and south coast of Cuba.

Habitat: Rocky bottoms and reefs, to 20 m depth.

Mithrax verrucosus H. Milne Edwards, 1832 (Figure 5b)

Examined material: Ten juveniles and three adults collected from Sardinero to Juraguá.

Geographic distribution: South Carolina, Florida, Bahamas, from West Indies to Rocks and Fernando de Noronha (Brazil), north and south coast of Cuba; Campeche Bank.

Habitat: Rocky and reef bottoms, hide in the holes of the rocks and corals, juveniles are commonly found on the intertidal rocky shore under rocks. The species is nocturnal and occurs in shallow waters to 20 m depth.

Remarks: Berried females were found in Santiago de Cuba in the months of March and April. The largest specimens are subject of subsistence fishing, but this activity is not representative.

Genus *Omalacantha* Streets, 1871

Omalacantha bicornuta (Latreille, 1825) (Figures 5c and 5d)

Examined material: Numerous specimens collected along the coast, including the input channel of the bay. Also, were found individuals of *M. bicornutus* in the Baconao Lagoon, and this is an evidence of faunal exchange of this lagoon system with the sea. Two young males from Cayo Damas, Chivirico, are deposited in the MChr (IC52).

Geographic distribution: Beaufort, North Carolina, Gulf of Mexico, and from Antilles to Florianópolis, Santa Catarina (Brazil), Bermuda, abundant along the coast of Cuba.

Habitat: Common in coral reefs, rocky, sandy, and meadows of angiosperms and macroalgae, in mangrove roots, mesolittoral to 30 m depth. Many specimens are fully covered with macroalgae.

Remarks: Ovigerous females were collected in February.

Genus *Pitho* Bell, 1835

Pitho aculeata (Gibbes, 1850)

Examined material: A male found dead in Siboney after the Hurricane Sandy (October 2012).

Geographic distribution: Bahamas, Florida, Antilles, north and south coast of Cuba, Colombia, Curaçao.

Habitat: Muddy, sandy, shell, coral and angiosperm meadows, on macroalgae (*Sargassum*), shallow waters to 20 m depth.

Pitho mirabilis (Herbst, 1794)

Examined material: One male collected between Siboney and Juticí (January 2013).

Geographic distribution: Bahamas and Florida Keys, from arc of the Antilles to Guadeloupe, southern coast of Cuba, Curaçao and Venezuela.

Habitat: Rocky and coral bottoms, shallow waters to 20 m depth.

Pitho lherminieri (Schramm, 1867) (Figures 5e-5h)

Examined material: One male and three ovigerous females from Cayo Damas, Chivirico, deposited in the MChR (IC57).

Geographic distribution: From North Carolina to west Florida, Veracruz, Mexico, from Antilles to Rio de Janeiro (Brazil), north and south coast of Cuba.

Habitat: Sandy, muddy and corallines bottoms, angiosperm prairies, shallow waters to 51 m depth, rarely to 220 m.

Remarks: Williams (1965) reported ovigerous females from Bahamas and Florida in May to November and from Brazil in December. The ovigerous females from Cayo Damas were collected in November.

Genus *Thoe* Bell, 1835

Thoe puella Stimpson, 1860 (Figures 5i and 5j)

Examined material: Numerous specimens collected along the coast, except within the bay.

Geographic distribution: Florida Keys and Dry Tortugas, Greater Antilles, Guadeloupe and
Curaçao.

Habitat: Rocky and corallines bottoms, reef corals, in shallow waters.

Remarks: Sometimes the observation of this species is difficult on rocky bottoms due its similar coloration with red encrusting protozoans.

Superfamily Pilumnoidea Samouelle, 1819
Family Pilumnidae Samouelle, 1819
Subfamily Pilumninae Samouelle, 1819
Genus *Pilumnus* Leach, 1815

Pilumnus floridanus Stimpson, 1871 (Figure 5k)

Examined material: Three specimens from Santiago de Cuba Bay.

Geographic distribution: From North Carolina to Florida, south cost of Cuba.

Habitat: Sandy, muddy, rocky, corallines and shells bottoms, marine prairies, on sponges, from the tide line to 146 m depth.

Remarks: Ovigerous females were reported from Florida from March to August and North Carolina in February.

Pilumnus lacteus Stimpson, 1871 (Figures 5l and 5m)

Examined material: Three specimens from Santiago de Cuba Bay.

Geographic distribution: Cuba is the type locality. From North Carolina to Florida.

Habitat: Sandy, shells, rocky, coral and muddy bottoms, over sponges and macroalgae, under rocks, in prairies, from the tide line to 32 m depth.

Pilumnus spinossisimus Rathbun, 1898 (Figure 5n)

Examined material: Two specimens collected in Siboney after the Hurricane Sandy (October 2012).

Geographic distribution: From Florida to Cuba.

Habitat: Rocky, corallines and shells bottoms, between 5 and 11 m depth.

Superfamily Portunoidea Rafinesque, 1815
Family Portunidae Rafinesque, 1815
Subfamily Portuninae Rafinesque, 1815
Genus *Achelous* De Hann, 1833

Achelous depressifrons (Stimpson, 1859) (Figures 6a and 6b)

Examined material: One ovigerous female from Cayo Damas, Chivirico, deposited in the MChR (IC53).

Geographic distribution: Bahamas, from North Carolina to Florida, Yucatán and Campeche Gulf, Lesser Antilles, Bermuda, north and south cost of Cuba.

Habitat: Sandy, rocky and corallines bottoms, angiosperm prairies, from shallow waters to 93 m depth.

Remarks: Rathbun (1930) reported ovigerous females to Florida between June and August, and Williams (1965) to Campeche in the same period. The ovigerous females from Cayo Damas were collected in November.

Genus *Callinectes* Stimpson, 1860

Callinectes marginatus (A. Milne Edwards, 1861)

Geographic distribution: Beaufort, North Carolina, from West Indies to São Paulo (Brazil), Bermuda, north and south coast of Cuba.

Habitat: Shallow water, rarely more than 15 m depth, usually at depths of 5 m or less and often in intertidal pools, on muddy and sandy with algae and marine angiosperms, also sandy-rocky beaches and mangroves. Gómez et al. (2009) founded this specie in salinities above 19 ups.

Feeding: Varied diet, including molluscs, benthic invertebrates, fish, carrion and detritus.

Remarks: This species is reported from Santiago de Cuba as *Callinectes larvatus* Ordway, 1863 by Gómez et al. (2009) but this is a junior synonym (Ng et al. 2008). There are no separate statistics on catch volumes in the Caribbean (Tavares 2002).

Callinectes rathbunae Contreras, 1930

Geographic distribution: East coast of Mexico, from Rio Grande to Veracruz. The species was cited to Santiago de Cuba by Gómez et al. (2009).

Habitat: Estuaries, lagoons and river mouth, in shallow waters.

Feeding: Varied diet, including molluscs, benthic invertebrates, fish, carrion and detritus.

Remarks: Probably, this species is part of local fisheries. This species is confused with others more abundant of the same genus.

Callinectes sapidus Rathbun, 1896

Geographic distribution: Western Atlantic, throughout coast from Nova Scotia to Argentina, including Florida, Bahamas, Gulf of Mexico, Antilles, and Cuba. East Atlantic, Denmark, Netherlands, North Sea, southeast of France, Gulf of Genova. Adriatic Sea. Aegean Sea. Western of Black Sea. Eastern Mediterranean. Pacific, Japan.

Habitat: Sandy and rocky bottoms, angiosperms prairies, mangrove. At the mouth of rivers, estuaries and shallow ocean waters, shallow waters to 90 m depth, most abundant until 35 m. The egg-laying and hatching occur at the mouths of rivers; larval development is oceanic, followed by migration of juveniles to estuaries to molt and mature as adults. It is likely that all species of the genus have a similar development on this species (Williams 1984).

This species is tolerant to extreme salinities, from fresh to hypersaline water between 44 and 48 ‰. The maximum record of salinity where the species had been found was 117 ‰ in Laguna Madre de Tamaulipas (Mexico). *Callinectes sapidus* tolerates temperatures from 3°C to 35°C and oxygen concentrations as low as 8 mgL^{-1}.

Feeding: Varied diet, including oysters, clams, benthic invertebrates, fish, vascular plants and macroalgae, carrion and detritus.

Remarks: This species has great commercial interest. Traditionally the largest catches are made in the Chesapeake Bay. In the Caribbean from 1984 to 1998, were captured 750,449 MT (an average of 50,029 MT/year). Specimens of *C. sapidus* can be caught with trawls, traps and/or hand nets, and are marketed fresh (Tavares 2002). The period of greatest interest to capture this species is when the body is soft, increasing their commercial value. In Santiago de Cuba, the species is subject of subsistence and commercial fisheries. *Callinectes sapidus* is also widely used in the preparation of dishes from the seafood restaurant (cocktails, tea crab, and paellas).

Callinectes similis Williams, 1966

Geographic distribution: From Delaware Bay to Key West, Florida to Gulf of Mexico, Yucatan and Campeche, from Cuba and Jamaica to Santa Catarina (Brazil), Colombia.

Habitat: Distributed in sandy or muddy shores, rarely in estuarine waters, in salinities of 24.9 to 37.4 ‰ and temperatures of 13.2–29.0°C; shallow waters to 92 m depth,

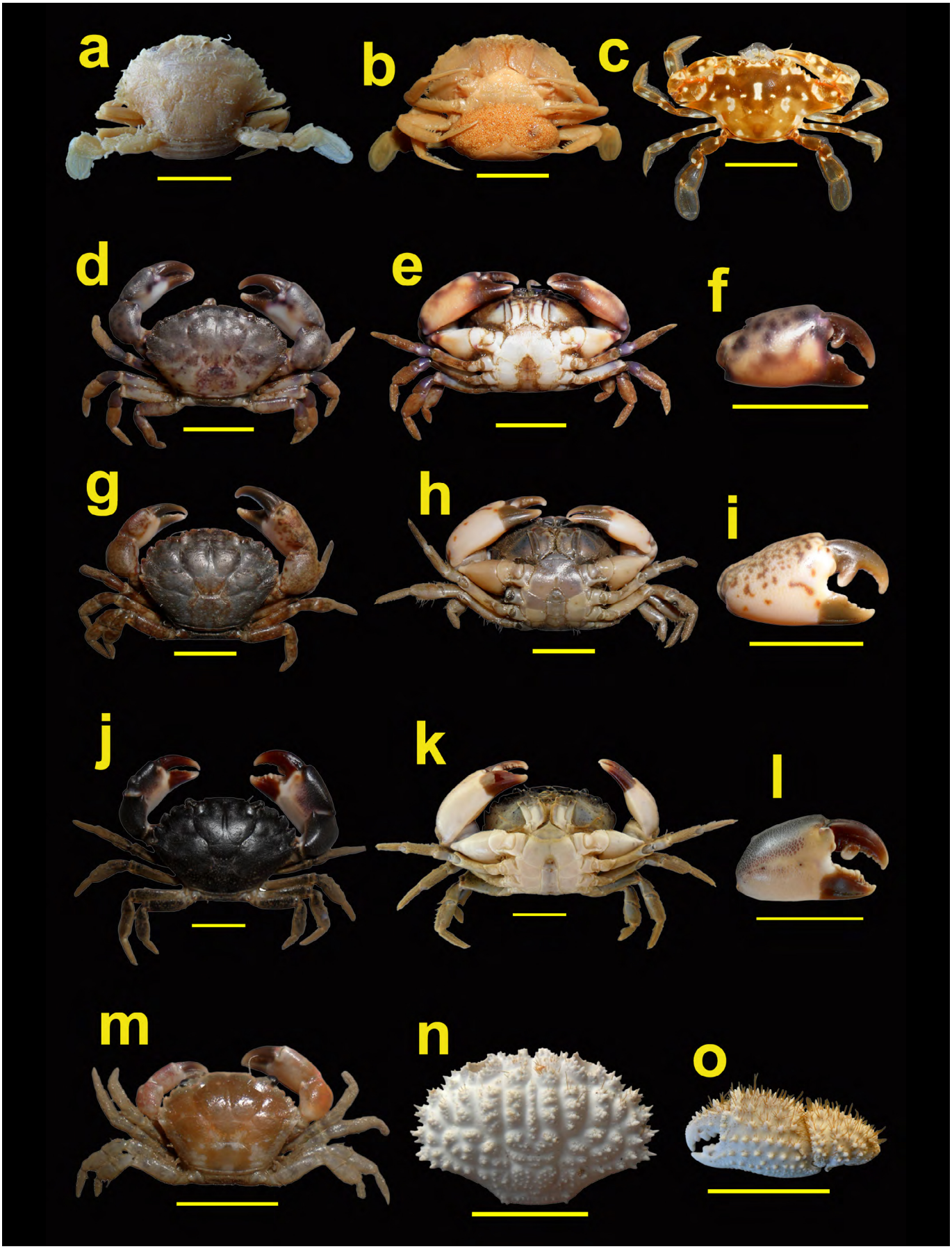

Figure 6. Brachyurans (Portunidae, Panopeidae and Xanthidae). **a–b**: *Achelous depressifrons* (a: dorsal view, and b: ventral view), **c**: *Portunus sayi*, **d–f**: *Eurypanopeus abbreviatus* (d: dorsal view, e: male in ventral view, and f: major chaela), **g–i**: *Panopeus hartii* (g: dorsal view, h: male in ventral view, and i: major chaela), **j–l**: *Panopeus herbstii* (j-dorsal view, k: male in ventral view, and l: major chaela), **m**: *Panopeus occidentalis*, **n–o**: *Actaea acantha* (n: carapace, and o: chaela). The color of the specimens is changed by the preservative solution. Each bar equals 1 cm.

rarely to 379 m. This species is associated with *C. sapidus*.

Feeding: Varied diet, analysis of stomach contents indicated the presence of fragments of plants, fish remains, polychaetes, crustaceans (*Farfantepenaeus aztecus* (Ives, 1891) and *Portunus gibbesii* (Stimpson, 1859)), molluscs and detritus.

Remarks: *Callinectes similis* is considered a potential resource for human consumption in the Gulf of Mexico where is great interest to fisheries. There are no separate statistics on volumes of catches of the species. Specimens of this species are caught with trawls and traps. Usually catches separated due to their small size or marketed fresh (Tavares 2002). In Santiago de Cuba is also consumed to be caught with their peers.

Genus *Portunus* Weber, 1795

Portunus sayi Gibbes, 1850 (Figure 6c)

Geographic distribution: Western Atlantic: from Nova Scotia through the Gulf of Mexico and the Antilles to Brazil. Eastern Atlantic: Canary Islands and Morocco.

Habitat: This species is normally pelagic, living among *Sargassum* masses, occasionally in littoral areas and marine prairies.

Remarks: Ovigerous females are reported from February to September.

Superfamily Xanthoidea Dana, 1851
Family Panopeidae Ortmann, 1893
Subfamily Panopeinae Ortmann, 1893
Genus *Eurypanopeus* A. Milne Edwards, 1880

Eurypanopeus abbreviatus (Stimpson, 1860) (Figures 6d–6f)

Examined material: Eight specimens collected in Santiago de Cuba Bay, Siboney and Juraguá, one female from Cayo Damas, Chivirico, deposited in the MChR (IC64).

Geographic distribution: South Carolina, The Antilles and Cuba, from Gulf of Mexico to Santa Catarina (Brazil).

Habitat: Rocky and sandy shore, in oyster beds, under rocks and between sponges and bryozoans, intertidal to shallow waters.

Remarks: Williams (1965) reported ovigerous females from the Greater Antilles between April and November and from Brazil between August and November. Ovigerous females were recorded in Santiago de Cuba in January.

Genus *Panopeus* H. Milne Edwards, 1834

Panopeus hartii Smith, 1869 (Figures 6g–6i)

Examined material: Many specimens collected in Aguadores (January 2014) and Santiago de Cuba Bay (February 2014).

Geographic distribution: Florida, Cuba and from The Antilles to São Paulo (Brazil).

Habitat: Coral reefs, rocky bottoms, tide line and shallow waters.

Panopeus herbstii H. Milne Edwards, 1834
(Figures 6j–6l)

Examined material: Fourteen specimens collected in La Socapa, Santiago de Cuba Bay (May 2012) and Aguadores (January 2014). A male from La Estrella, Santiago de Cuba Bay and many males and females from Aguadores deposited in MChT (IC11 and IC31, respectively).

Geographic distribution: Bermuda, Bahamas, from Massachusetts to Florida and Veracruz, Mexico, north and south coast of Cuba, from The Antilles to Brazil and Uruguay, Caribbean coast of Panama to Venezuela.

Habitat: Sandy-rocky, shells and muddy bottoms of bays and estuaries, in oyster beds, mangroves and coral reefs, mesolittoral to 22 m depth.

Panopeus occidentalis Saussure, 1857 (Figure 6m)

Examined material: Two specimens collected in Juraguá and one male in Santiago de Cuba Bay.

Geographic distribution: From North Carolina and Florida to Santa Catarina (Brazil), through The Antilles, north and south coast of Cuba.

Habitat: Sandy, rocky and shells funds, mangroves, in sponges, macroalgae and ascidians, mesolittoral to 18 m depth.

Family Xanthidae Dana, 1851
Subfamily Acteinae Alcock, 1898
Genus *Actaea* De Haan, 1833

Actaea acantha (H. Milne Edwards, 1834) (Figures 6n and 6o)

Examined material: A female collected in Siboney after the Hurricane Sandy (October 2013).

Geographic distribution: Florida and from The Antilles to Fernando de Noronha (Brazil), western coasts of Cuba.

Habitat: Rocky, sandy, shell, coral, mud and meadows funds, from shallow waters to 50 m depth.

Genus *Platyactaea* Guinot, 1967

Platyactaea setigera (H. Milne Edwards, 1834) (Figures 7a–7c)

Examined material: One female collected in Sardinero (June 2010), one male in Juticí (April 2012) and one pair and two juveniles in Juraguá (May 2012).

Geographic distribution: Bermuda, Bahamas and Florida, From The Antilles to Trinidad and Curaçao,

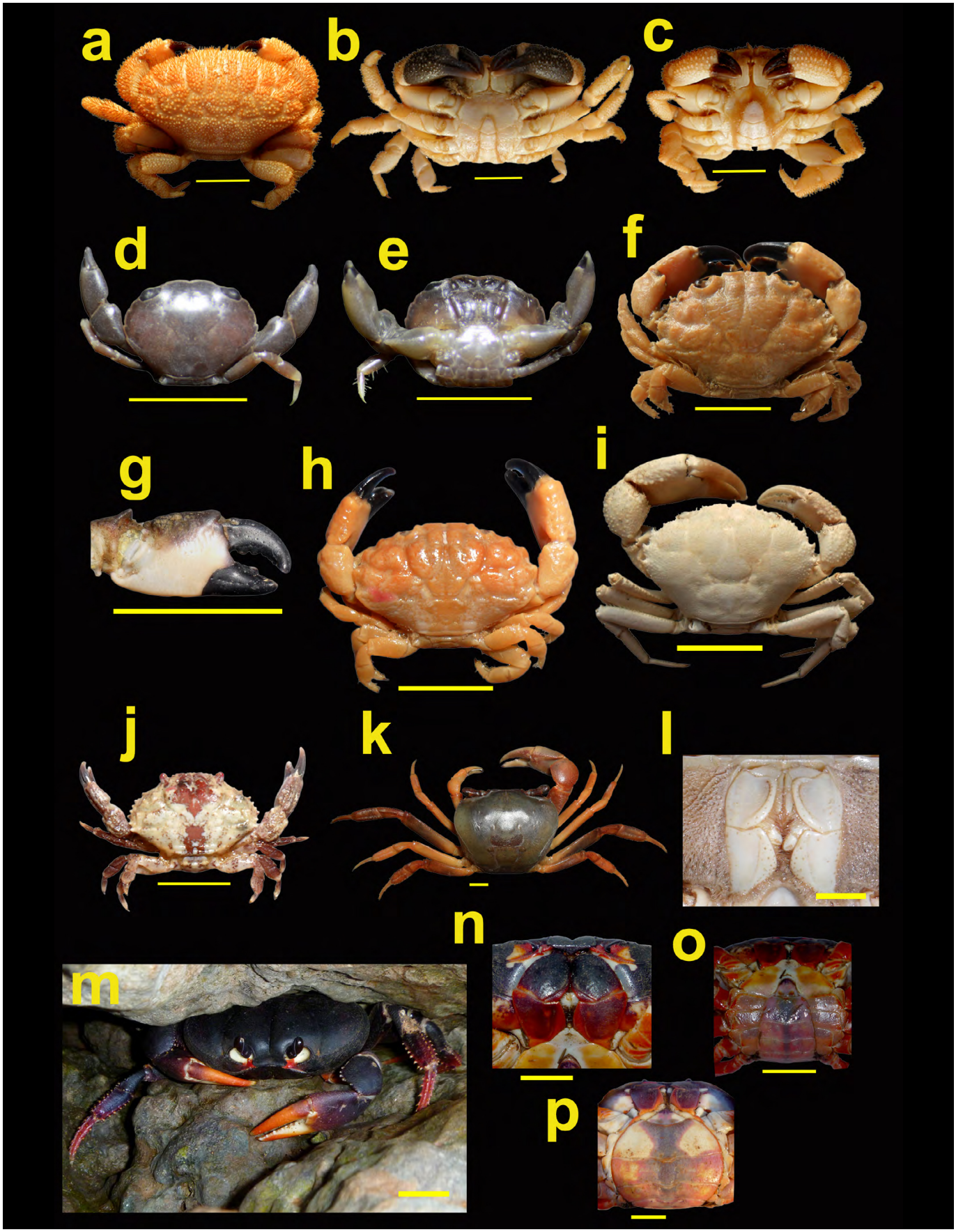

Figure 7. Brachyurans (Xanthidae and Gecarcinidae). **a–c**: *Platyactaea setigera* (a: dorsal view, b: male in ventral view, and c: female in ventral view), **d–e**: *Paraliomera dispar* (d: dorsal view, and e: male in ventral view), **f–g**: *Cataleptodius floridanus* (f: dorsal view, and g: major chaela), **h**: *Cataleptodius parvulus*, **i**: *Microcassiope granulimana*, **j**: *Xanthodius denticulatus*, **k–l**: *Cardiosoma guanhumi* (k: dorsal view, and l: maxilas), **m–p**: *Gecarcinus ruricola* (m: animal in a rocky habitat, n: maxilas, o: male abdomen, and p: female abdomen). The color of the specimens is changed by the preservative solution. Each bar equals 1 cm.

north and south coast of Cuba, Caribbean coast of Colombia.

Habitat: Coral reefs and rocky bottoms, to 20 m depth.

Subfamily Liomerinae Sakai, 1976
Genus *Paraliomera* Rathbun, 1930

Paraliomera dispar (Stimpson, 1871) (Figures 7d and 7e)

Examined material: One male and a female collected in Santiago de Cuba Bay.

Geographic distribution: Cuba is the type locality. From Florida to South America.

Habitat: Rocky, sandy and muddy bottoms, marine praries and coral reef, shallow wathers to 154 m depth.

Subfamily Xanthinae MacLeay, 1838
Genus *Cataleptodius* Guinot, 1968

Cataleptodius floridanus (Gibbes, 1850) (Figures 7f and 7g)

Examined material: Numerous specimens collected along the coast; one male from Cayo Damas, deposited in the MChR (IC65).

Geographic distribution: From Florida to Sao Paulo (Brazil), The Antilles, western coasts of Cuba.

Habitat: Sandy, rocky and reef bottoms, on sponges, associated with *Sargassum*, muddy areas and meadows of macroalgae and angiosperms, in mesolittoral pools to 50 m depth.

Cataleptodius parvulus (Fabricius, 1793) (Figure 7h)

Examined material: A male collected in Juraguá (March 2012) and other in Aguadores (January 2014).

Geographic distribution: Florida, Cuba and from the other Antilles to Fernando de Noronha, (Brazil), Bermuda.

Habitat: Mesolittoral, in tide pools and under rocks, shallow waters.

Genus *Microcassiope* Guinot, 1967

Microcassiope granulimana (Stimpson, 1871) (Figure 7i)

Examined material: One specimen collected in Siboney after the Hurricane Sandy (October 2012).

Geographic distribution: Bahamas, from southwest coast of Cuba to Curazao, Venezuela.

Habitat: Rocky bottoms to 20 m depth.

Genus *Xanthodius* Stimpson, 1859

Xanthodius denticulatus (White, 1848) (Figure 7j)

Examined material: One male and one female collected in Juraguá (March 2012) and one ovigerous female in Mar Verde (February 2014).

Geographic distribution: Bermuda, Bahamas, Florida, north and south coast of Cuba, from The Antilles to Pernambuco and Abrolhos Islands (Brazil), Colon (Panama), Gulf of Guinea.

Habitat: Tide pools, coral reefs, and rocky bottoms, mesolittoral to 12 m deep.

Remarks: Ovigerous females were collected in February.

Subsection Thoracotremata Guinot, 1977
Superfamily Grapsoidea McLeay, 1838
Family Gecarcinidae McLeay, 1838
Genus *Cardisoma* Latreille, 1825

Cardiosoma guanhumi Latreille, 1828 (Figures 7k and 7l)

Examined material: Two males and one female collected in Juraguá, one male from Sardinero deposited in the MChR (IC06).

Geographic distribution: Bermuda, Bahamas, Florida, Louisiana and South Texas, from Mexico to Colombia, the entire coastline of Cuba and The Antilles, from Colombia to São Paulo (Brazil).

Habitat: This species is almost completely terrestrial and lives in large concentrations in caves to 1.5 m deep, along channels and among stones, common in mangrove areas. The caves can be up to 8 km from the sea but always near water bodies. Despite its terrestrial habitat, specimens of *C. guanhumi* need gills wet occasionally, but they can survive long periods of immersion and easily adapt to large variations in salinity. Its spawning occurs at sea.

Feeding: Feed on a wide variety of plants, occasionally carrion and there have been reports of cannibalism.

Remarks: The species has local fishing interest, mostly in the spring months where they begin to leave the rest after rains for feeding and spawning.

Genus *Gecarcinus* Leach, 1814

Gecarcinus ruricola (Linnaeus, 1758) (Figures 7m–7p)

Examined material: Three males and two females collected along the coast, one female from not specified site in Santiago de Cuba, deposited in the MChR (IC26)

Geographic distribution: Bahamas, southern Florida, north and south coasts of Cuba, Jamaica, Hispaniola, Cayman Islands, Barbados and Curaçao.

Habitat: The adult state of this species occurs in land, meso and supralittoral sandy, muddy, between the cracks and karst holes, under rocks and logs, wooded areas, mountainous areas reaches 500 m altitude.

Remarks: Between March and April, the species migrate from the forest areas where they refugee and feed, sometimes many kilometers inland, to the beaches to spawn. During this migration, thousands of specimens die crushed on the roads.

Family Grapsidae McLeay, 1838
Subfamily Grapsinae MacLeay, 1838
Genus *Geograpsus* Stimpson, 1858

Geograpsus lividus (H. Milne Edwards, 1837) (Figure 8a)

Examined material: Five specimens collected along the coast, except inside the bay.

Geographic distribution: Western Atlantic, Florida Keys, north and south of Cuba, Colombia and from Venezuela to São Paulo (Brazil). Eastern Pacific, from Baja California to Chile, Hawaii.

Habitat: Supra and mesolittoral, sandy-rocky shore.

Remarks: Ovigerous females were found in the months of March and April.

Genus *Goniopsis* De Haan, 1833

Goniopsis cruentata (Latreille, 1803) (Figure 8b)

Examined material: Four specimens collected in mangroves and river mouths in Buey Cabón, Juraguá and Baconao.

Geographic distribution: Western Atlantic, Florida, Bahamas, Mexico, Honduras, north and south coast of Cuba, from The Antilles to Venezuela, from Suriname to São Paulo (Brazil). Eastern Atlantic, from Senegal to northern Angola.

Habitat: Supra and mesolittoral rocky shore, estuarine areas, mangrove roots and trunks.

Genus *Grapsus* Lamarck, 1801

Grapsus grapsus (Linnaeus, 1758) (Figures 8c and 8d)

Examined material: Five specimens collected along the coast, two male and one female from Siboney deposited in the MChR (IC05).

Geographic distribution: Western Atlantic, Bermuda, Bahamas, from Florida to Texas, Cuba, the entire coastline of Cuba, from Colombia to Brazil. Eastern Atlantic, from Portugal to Angola, Green Cape and Azores, St. Helena Island, Ascension Island. American Pacific, Baja California to Chile, Galapagos, Clipperton Island.

Habitat: Supra and mesolittoral rocky shore and cliffs.

Genus *Pachygrapsus* Randall, 1839

Pachygrapsus gracilis (Saussure, 1858) (Figure 8e)

Examined material: Many specimens collected in Santiago de Cuba Bay (January and February 2014).

Geographic distribution: Western Atlantic, Bahamas, from Florida to Texas, Greater Antilles, north and south coast of Cuba, Virgin Islands, from Colombia to Bahia (Brazil), Bermuda. Eastern Atlantic, from Senegal to Zaire.

Habitat: Supralittoral, intertidal rocky shore, mangrove; salinities 5–10‰.

Remarks: Ovigerous females were collected in February.

Pachygrapsus transversus (Gibbes, 1850) (Figure 8f)

Examined material: Fifteen specimens collected along the coast.

Geographic distribution: Western Atlantic, Bermuda, Bahamas, North Carolina and from Florida to Louisiana, north and south of Cuba, from The Antilles to Bahia (Brazil), and Uruguay. Eastern Atlantic, from Mediterranean to Angola. Eastern Pacific, from California to Peru, Galapagos Islands.

Habitat: Mesolittoral, sandy-rocky shore, in mangrove.

Remarks: Ovigerous females are record in Santiago de Cuba in December.

Family Plagusiidae Dana, 1851
Subfamily Plagusiinae Dana, 1851
Genus *Plagusia* Latreille, 1804

Plagusia depressa (Fabricius, 1775) (Figures 8g and 8h)

Examined material: Three specimens collected along the coast, one specimen from La Socapa, Santiago de Cuba Bay, deposited in the MChR (IC24).

Geographic distribution: Western Atlantic, Beaufort, North Carolina, Bermuda, Gulf of Mexico, Cuba and from the West Indies to Pernambuco (Brazil), Azores. Eastern Atlantic, Madeira, from Morocco to northern Angola, St. Helena Island.

Habitat: Mesolittoral, rocky shore, in tide pools and hollows.

Subfamily Percninae Števčić, 2005
Genus *Percnon* Gistel, 1848

Percnon gibbesi (H. Milne Edwards, 1853) (Figure 8i)

Examined material: Seven specimens collected along the coast.

Geographic distribution: Western Atlantic, North Carolina, Florida, Bermuda, Bahamas, north coast of Cuba, Jamaica, Puerto Rico, Colon (Panama), Brazil. Eastern Atlantic, from Azores to South Africa. Eastern Pacific, from Baja California to Chile, Galapagos, Clipperton Island.

Habitat: Mesolittoral and shallow waters, rocky areas, associated with *Diadema antillarum* Phillipi, 1845.

Family Sesarmidae Dana, 1851
Genus *Aratus* H. Milne Edwards, 1853

Aratus pisonii (H. Milne Edwards, 1837) (Figure 8j)

Geographic distribution: Western Atlantic: Bahamas, Florida and the Antilles to Brazil. Eastern Pacific: Nicaragua to Peru.

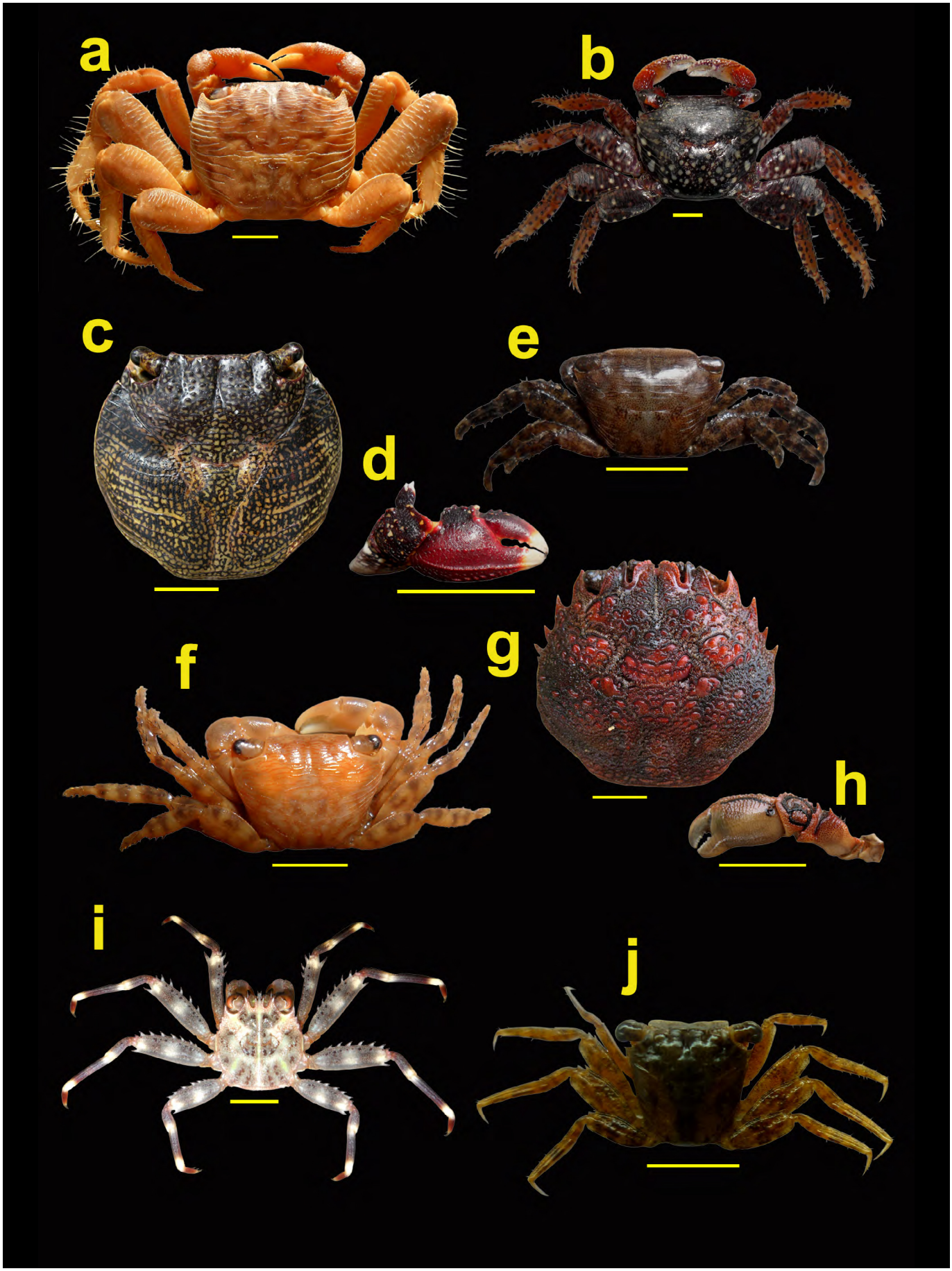

Figure 8. Brachyurans (Grapsidae and Plagusiidae). **a**: *Geograpsus lividus*, **b**: *Goniopsis cruentata*, **c–d**: *Grapsus grapsus* (c: carapace, and d: chaela), **e**: *Pachygrapsus gracilis*, **f**: *Pachygrapsus transversus*, **g–h**: *Plagusia depressa* (g: carapace, and h: chaela), **i**: *Percnon gibbesi*, **j**: *Aratus pisonii*. The color of the specimens is changed by the preservative solution. Each bar equals 1 cm.

Habitat: Estuarine areas, in mangroves, woods and supralittoral rocky shore.

Genus *Armases* Abele, 1992

Armases angustipes (Dana, 1852) (Figure 9a)

Examined material: Many specimens collected in La Socapa, Santiago de Cuba Bay, including ovigerous females (May 2012) and in Juraguá (March 23, 2014).

Geographic distribution: Jamaica, Cuba, St. Tomas, Mexico, Belize, Nicaragua and Venezuela.

Habitat: Intertidal sandy and rocky shores, under woods, estuarine zones.

Remarks: Ovigerous females were found in May and June.

Genus *Sesarma* Say, 1817

Sesarma curacoense de Man, 1892 (Figure 9b)

Examined material: Three specimens collected along the coast, two young specimens from Cayo Damas, Chivirico, deposited in the MChR (IC66).

Geographic distribution: Florida, north and south coast of Cuba, Jamaica, Puerto Rico, Curaçao, from Venezuela to Bahia (Brazil).

Habitat: Mesolittoral and shallow waters, muddy and rocky coasts, mangroves.

Family Varunidae H. Milne-Edwards, 1853
Subfamily Cyclograpsinae H. Milne-Edwards, 1853
Genus *Cyclograpsus* H. Milne Edwards, 1837

Cyclograpsus integer H. Milne Edwards, 1837 (Figure 9c)

Examined material: twenty-four specimens collected along the coast, one male and one ovigerous female from Cayo Damas, Chivirico, deposited in the MChR (IC56).

Geographic distribution: Bahamas, Florida, Cuba and other Greater Antilles, from Colombia to Brazil.

Habitat: Sandy-muddy supra and mesolittoral shore, under rocks and woods.

Remarks: Ovigerous females were found between May and January. The species occurs in oily water with a high degree of organic pollution on beaches and very clear water.

Superfamily Ocypodoidea Rafinesque, 1815
Family Ocypodidae Rafinesque, 1815
Subfamily Ocypodinae Rafinesque, 1815
Genus *Ocypode* Weber, 1795

Ocypode quadrata (Fabricius, 1787) (Figure 9d)

Examined material: Five specimens collected along the coast, except inside the bay. Two females and one male from Caney, and three young specimens from Siboney deposited in the MChR (IC07 and IC08, respectively).

Geographic distribution: From Rhode Island to Santa Catarina (Brazil), Bermuda, Cuba and throughout The Antilles, northern and southern coast of Cuba.

Habitat: Meso and supralittoral of sandy beaches, excavate galleries that have two openings close to each other.

Remarks: The species presents a clear color, depending of the color of sand inhabited, ranges from milky white to gray and cream, as a measure of camouflage.

Subfamily Ucinae Dana, 1851
Genus *Uca* Leach, 1814

Uca burgersi Holthuis, 1967 (Figures 9e–9g)

Examined material: thirteen specimens collected in Buey Cabón, Santiago de Cuba Bay, Sardinero, Siboney and Juraguá, two males from El Retiro deposited in the MChR (IC79).

Geographic distribution: East Florida, from northeast of Yucatán to Guatemala, Panama, from Venezuela to Rio de Janeiro (Brazil), Great and Lesser Antilles, north and south coast of Cuba.

Habitat: Supra and intertidal muddy and sandy-muddy littoral, in mangroves. This species is usually associated with *U. rapax* (Smith, 1870).

Remarks: *Uca burgersi* and *U. rapax* are consideredthe most common and widely distributed species in the West Indies. Until the description of this species in 1967, specimens of *U. burgersi* were usually identified as *U. mordax* (Smith, 1870).

Uca rapax (Smith, 1870) (Figures 9h–9j)

Examined material: Six specimens collected in Santiago de Cuba Bay.

Geographic distribution: Bahamas, Florida, from Mexico to Guatemala, from Panama to Santa Catarina (Brazil), Great and Lesser Antilles, north and south cost of Cuba.

Habitat: Supra and intertidal muddy and sandy-muddy littoral, in mangroves and river shore. This species is usually associated with *U. burgersi*.

Family Ucididae Števčić, 2005
Genus *Ucides* Rathbun, 1897

Ucides cordatus (Linnaeus, 1763) (Figure 9k)

Examined material: Three specimens collected in Buey Cabón and Baconao.

Geographic distribution: Florida, The Antilles including Cuba, South America to Santa Catarina (Brazil).

Habitat: Associated with mangroves, this species digs burrows up to 70 cm, in areas close to water or land

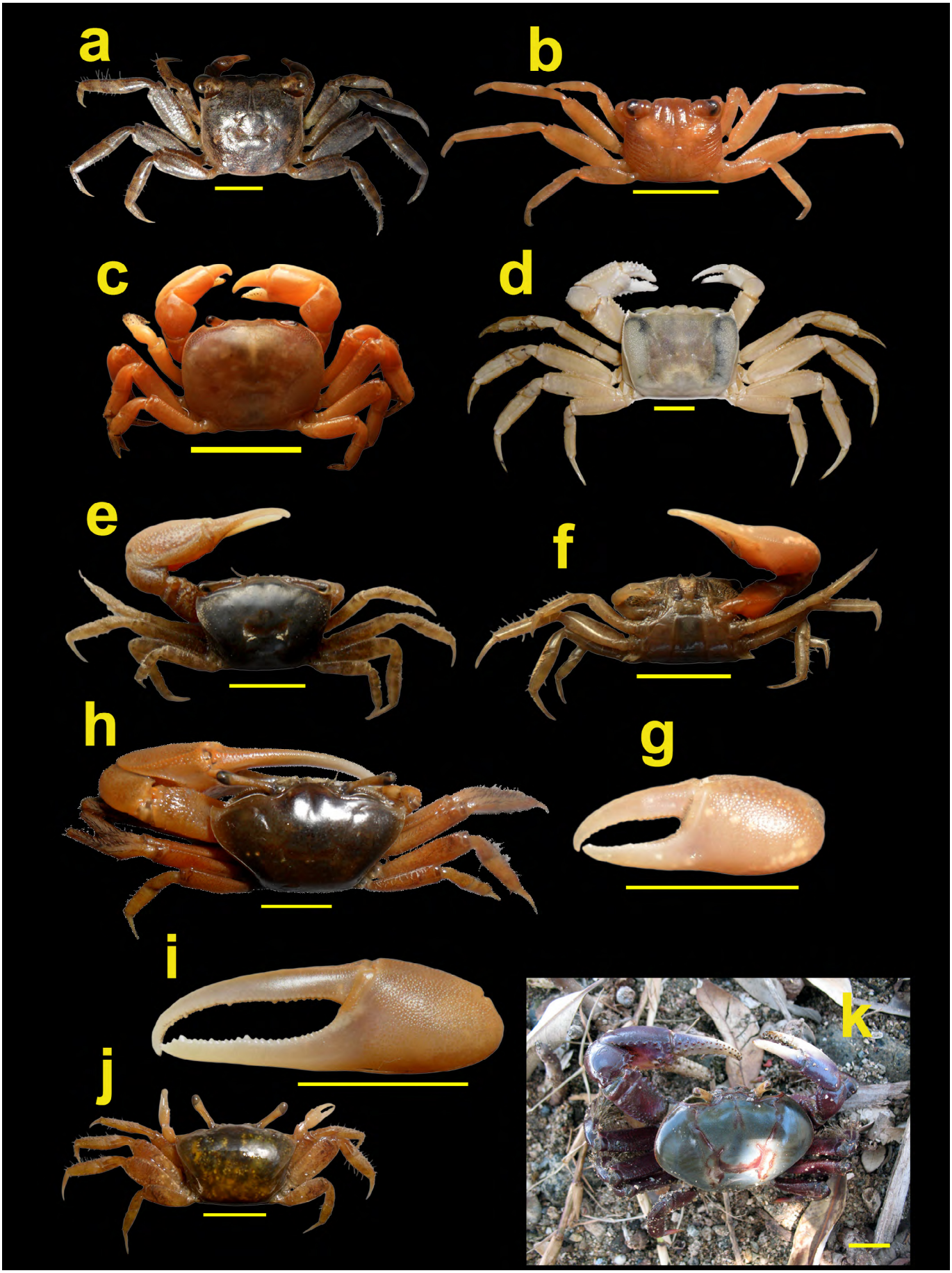

Figure 9. Brachyurans (Plagusiidae, Sesarmidae, Varunidae, Ocypodidae and Ucididae). **a**: *Armases angustipes*, **b**: *Sesarma curacoense*, **c**: *Cyclograpsus integer*, **d**: *Ocypode quadrata*, **e–g**: *Uca burgersi* (e: male in dorsal view, **f**: male in ventral view, and **g**: male major chaela), **h–j**: *Uca rapax* (h: male in dorsal view, i: male major chaela, and j: female), **k**: *Ucides cordatus*. The color of the specimens is changed by the preservative solution. Each bar equals 1 cm.

until further into the vegetation below and shares the habitat with other crabs (*Cardiosoma* Latreille, 1825, *Uca* Leach, 1814, *Goniopsis* De Haan, 1833).

Remarks: *Ucides cordatus* and *Callinectes bocourti* A. Milne Edwards, 1879 are the most important crabs in the fishery of Suriname, and *U. cordatus* is caught intensively in Guyana. The species is traditionally caught by hand in their burrows. They are sold fresh or processed. There are no statistics on the volume of catches (Tavares 2002).

DISCUSSION

The most recent samplings have allowed to add a kind of porcellain, *Megalobranchium poeyi*, to list the group in the study area (Diez and Jover 2013), which highlights the importance of Cuba's southeast coast (42% of the species recorded for Cuban waters) as part of the corridor of the Caribbean and West Indies. Hermit crabs continue as one of the least studied groups, with only seven species of the 37 recorded for Cuba. They are widely distributed from Florida to the entire Caribbean Sea. In future studies, with the exploration of biotopes at greater depths, the number of known species of hermit crabs may increase.

Lalana and Ortiz (2000) compiled 313 species and subspecies of brachyuran from Cuban waters; 309 of these were considered valid and four subspecies are not correctly defined. Following this review, we added another species to this list (Lalana et al. 2007) and Gómez et al. (2009) validated the presence of three other species of portunids collected in Santiago de Cuba (*Callinectes larvatus*, *C. rathbunae* and *C. similis*). According to the published literature, there are 313 species of true crabs in Cuba. With this necessary clarification, was determined that the 66 species (in 20 families) of brachyuran registered in Santiago de Cuba represent 21% of those contained in the Cuban shelf. This representation is more significant if we consider that many of the recorded species in Cuba have been collected only in deep water.

All sampled species are well represented in the West Indies and Caribbean Sea, and many from Florida to Brazil or to the Gulf of Mexico (Powers 1977; Williams 1984; Abele and Kim 1988). Until now, a large part of the marine fauna of the eastern coast of Cuba remains to be inventoried (Diez and Jover 2012, 2013). It shows the great significance of local systematic studies, which update the lists of species and their biogeography.

ACKNOWLEDGEMENTS

We thank Frank Soto Gómez for the use of the camera and the Centro Oriental de Biodiversidad y Ecosistemas (BIOECO) for ease of access to protected areas in their custody. We also thank Leticia Delgado Cobas for the English review and her valuables comments and the manuscript reviewers for their valuable suggestions.

LITERATURE CITED

Abele, L.G. and W. Kim. 1986. An illustrated guide to the marine decapod crustaceans of Florida. Florida: Florida State University. 225 pp.

Barro, A., E. Fonseca, M. Ortiz and R. Lalana. 2013. Lista de los crustáceos marinos y estuarinos (Arthropoda, Crustacea) de Boca Canací, Mayabeque, Cuba. Revista Cubana de Ciencias Biológicas 2(1): 38–42. http://www.rccb.uh.cu/index.php/RCCB/article/view/148/107

Diez, Y. and A. Jover. 2012. Moluscos marinos del sector Bahía de Puerto Padre-Bahía de Nipe, Cuba. Amici Molluscarum 20(1): 17–28. http://www.amicimolluscarum.com/app/download

Diez, Y. and A. Jover. 2013. Distribución de los cangrejos porcelánidos (Decapoda: Anomura) en la costa de Santiago de Cuba, con la adición de especies para Cuba. Revista de Investigaciones Marinas 33(1): 50–54. http://www.oceandocs.org/bitstream/1834/4925/1/(8)968.pdf

Diez, Y., I. Amador and R. Suárez. 2013. La Administración Portuaria de Santiago de Cuba como gestora de un desarrollo portuario ambientalmente responsable. Ciencia en su PC 2: 26–35. http://cienciapc.idict.cu/index.php/cienciapc/article/view/286

Gómez, L., A. Sosa, I. Moreno and A. Jover. 2009. Biodiversidad, morfometría y alimentación de los cangrejos del género *Callinectes* (Decapoda: Portunidae) en Santiago de Cuba. Revista de Biología Tropical 57(3): 671–686.

Gómez, L., Y. Larduet and N. Abrahantes. 2001. Contaminación y biodiversidad en ecosistemas acuáticos. El fitoplancton de la Bahía de Santiago de Cuba. Revista de Investigaciones Marinas 22(3): 191–197. http://www.cim.uh.cu/rim/pdf/2007/2/2007-097.pdf

Gore, R.H. 1982. Porcellanid crabs from the coasts of Mexico and Central America (Crustacea: Decapoda: Anomura). Washington: Smithsonian Contribution to Zoology 363: 34 pp. doi: 10.5479/si.00810282.363

Gore, R.H. 1983. The identity of *Petrolisthes marginatus* and the description of *Petrolisthes dissimulatus*, n. sp. (Crustacea Decapoda Porcellanidae). Proceedings of the Biological Society of Washington 96(1): 89–102. http://biodiversitylibrary.org/page/34593170

Holthuis, L. 1959. The Crustacea Decapoda of Suriname (Dutch Guiana). Zoologische Verhandelingen 44: 1–296. http://www.repository.naturalis.nl/record/317569

Juarrero, A. and M. Ortiz. 2003. Los cangrejos del género *Uca* (Crustacea: Brachyura: Ocypodidae) en Cuba. Apuntes taxonómicos. Cocuyo 13: 7–10. http://cerambycids.com/cocuyo/pdf/cocuyo_13_2003.pdf

Lalana, R. and M. Ortiz. 2000. Lista actualizada de los crustáceos decápodos de Cuba. Revista de Investigaciones Marinas 21(1–3): 33–44. http://www.cim.uh.cu/rim/OldSite/pdf/2000/1/2000-33.pdf

Lalana, R., M. Ortiz and C. Varela. 2007. Crustáceos (Arthropoda: Crustacea) de la playa María La Gorda, costa sur de la Península de Guanahacabibes, Pinar del Río, Cuba. Biología 21(1–2): 79–82. http://www.cim.uh.cu/rim/OldSite/pdf/2000/1/2000-33.pdf

Lalana, R., M. Ortiz, C. Varela and N. Tariche. 2004. Compilación sobre los invertebrados colectados en las expediciones del "Atlantis" en el archipiélago cubano. Revista de Investigaciones Marinas 25(1): 3–14. http://www.cim.uh.cu/rim/OldSite/pdf/2004/1/2004-3.pdf

Lira, C., G. Hernández and J. Bolaños. 2001. Cangrejos porcelánidos (Decapoda: Anomura) de las Islas Orientales de Venezuela. I — El género *Megalobrachium* Stimpson, 1858, con dos adiciones a la carcinofauna venezolana. Boletín del Instituto Oceanográfico de Venezuela 40: 55–66. http://ri.bib.udo.edu.ve/bitstream/123456789/3008/2/07-CANGREJOS%20PORCELANIDOS.pdf

Mantelatto, F., R. Robles, C. Schubart and D. Felder. 2009. Molecular Phylogeny of the Genus *Cronius* Stimpson, 1860, with Reassignment of *C. tumidulus* and Several American Species of *Portunus* to the Genus *Achelous* De Haan, 1833 (Brachyura: Portunidae); pp. 554–562, in: J. Martin, K. Crandall and D. Felder (*eds.*). Decapod crustacean phylogenetics. (Crustacean issues, S. Koenemann (ed.), Vol. 18). Boca Raton, London, New York: CRC Press, Taylor & Francis Group. doi: 10.1201/9781420092592-c29

Martínez-Iglesias, J.C. and O. Gómez. 1986. Los crustáceos decápodos del Golfo de Batabanó. Poeyana 332: 1–91.

Ng, P., D. Guinot and P. Davie. 2008. Systema Brachyurorum: Part I. An annotated checklist of extant brachyuran crabs of the world. The Raffles Bulletin of Zoology 17: 1–286. http://www.lkcnhm.nus.edu.sg/rbz/biblio/s17/s17rbz.pdf

Ortiz, M. 2001. Lista de invertebrados marinos, estuarinos y semiterrestres de la playa de Cojímar, en la costa norte de la provincia Ciudad de La Habana. Revista de Investigaciones Marinas 22(2): 93-102. http://www.cim.uh.cu/rim/OldSite/pdf/2001/2/2001-93.pdf

Osawa, M. and P. McLaughlin. 2010. Annotated checklist of anomuran decapod crustaceans of the world (exclusive of the Kiwaoidea and families Chirostylidae and Galatheidae of the Galatheoidea) Part II – Porcellanidae. The Raffles Bulletin of Zoology 23: 109–129. http://lkcnhm.nus.edu.sg/rbz/biblio/s23/s23rbz109-129.pdf

Powers, L. 1977. Crabs (Brachyura) of the Gulf of Mexico. Contributions in Marine Science 20. 190 pp.

Rathbun, M.J. 1925. The spider crabs of America. United States National Museum Bulletin 129: 1–613 pp. doi: 10.5479/si.03629236.129.i

Rathbun, M.J. 1930. The cancroid crabs of America of the families Euryalidae, Portunidae, Atelecyclidae, Cancridae and Xanthidae. United States National Museum Bulletin 152: 1–609. doi: 10.5479/si.03629236.152.i

Rodríguez, G. 1980. Crustáceos decápodos de Venezuela. Caracas: Instituto Venezolano de Investigaciones Científicas. 444 pp.

Tavares, M. 2002. True crabs; pp. 328–352, in: K.E. Carpenter (ed.). The living marine resources of the western central Atlantic Vol. 1: Introduction, molluscs, crustaceans, hagfishes, sharks, batoid fishes and chimaeras. Rome: FAO Species Identification Guide for Fishery Purposes and American Society of Ichthyologists and Herpetologists Special Publication No. 5.

Varela, C., M. Ortiz, and R. Lalana. 2003. Crustáceos (Peracarida y Decapoda), de la costa sur de la Península de Guanahacabibes, Cuba. Revista de Investigaciones Marinas 24(1): 73–76. http://www.cim.uh.cu/rim/OldSite/pdf/2003/1/2003-73.pdf

Werding, B., A. Hiller and R. Lemaitre. 2003. Geographic and depth distributional patterns of western Atlantic Porcellanidae (Crustacea: Decapoda: Anomura), with an updated list of species. Memoirs of Museum Victoria 60(1): 79–85. http://museumvictoria.com.au/pages/4039/60_1_werding.pdf

Williams, A. 1965. Marine decapod crustaceans of the Carolinas. Fishery Bulletin 65(l): 1–298.

Williams, A. 1984. Shrimps, lobsters, and crabs of the Atlantic coast of the eastern United States, Maine to Florida. Washington: Smithsonian Institution Press. 550 pp.

Windsor, A. and D. Felder. 2014. Molecular phylogenetics and taxonomic reanalysis of the family Mithracidae MacLeay (Decapoda: Brachyura: Majoidea). Invertebrate Systematics 28: 145–173. doi: 10.1071/IS13011

Authors' contribution statement: YLDG collected and idenfied the specimens and wrote in part the text, AJC wrote in part the text and performed the literature research.

Received: November 2014
Accepted: February 2015
Editorial responsibility: Luis E. Arruda Bezerra