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Photographic Identification Guide to Some Common Marine Invertebrates of Bocas Del Toro, Panama

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This identification guide is the result of intensive sampling of shallow-water habitats in Bocas del Toro during 2003 and 2004. The guide is designed to aid in identification of a selection of common macroscopic marine invertebrates in the field and includes 95 species of sponges, 43 corals, 35 gorgonians, 16 nemerteans, 12 sipunculeans, 19 opisthobranchs, 23 echinoderms, and 32 tunicates. Species are included here on the basis on local abundance and the availability of adequate photographs. Taxonomic coverage of some groups such as tunicates and sponges is greater than 70% of species reported from the area, while coverage for some other groups is significantly less and many microscopic phyla are not included. Since this guide does not include microscopic structures such as spicule morphology in sponges and gorgonians, or internal soft anatomy which is often necessary for accurate identification of marine invertebrates, certain identification of many species will require subsequent detailed examination in the laboratory. We expect that the photographs and descriptions provided here will significantly increase the ease with which preliminary field identifications can be made.

PHYLUM PORIFERA

Clathrina primordialis (Haeckel, 1872)

Identification—Flat cushions (0.5-3 cm in diameter) comprised of a tightly knit trelliswork of tubes about 1 mm wide. Bright, lemon-yellow to pale yellow. Compressible, fragile. The surface is smooth. Few oscules (1-2 mm wide).
Distribution—Common, on peat banks and occasionally grow on other sponges.
Notes—Scale = 1 cm. Photo by M. C. Díaz

Plakortis angulospiculatus (Carter, 1882)

Identification—Thick encrusting (1-5 cm thick). Brown to greenish-gray, or yellowish externally, lighter brown to tan internally. Smooth surface, but it may have papillae or slits. Oscules (<1 cm wide), with a collar-membrane. Dense (like cheese) and compressible.
Distribution—Rare, found on mangrove roots, peat banks, and open reef environments (0.5-50 m deep). Wide Caribbean.
Notes—Close species are *P. halichondroides* (Wilson, 1902) a dark-chocolate species, with a dark exhudate, and *P. zygompha* (De Laubenfels, 1934) a thin species (3-6 mm in thickness). Scale = 3 cm. Photo by M. C. Díaz.

Plakinastrella onkodes Ulizka, 1929

Identification—Thick encrusting to massive-lobate (up to 15 cm high). Brown to gray-black externally, tan internally. Some specimens show darker spots. Oscules with a membrane (1-2 cm wide). Smooth, but slightly rough surface to the touch. Compressible and dense.
Distribution—Rare, found on reefs open habitats (>10 m deep). Belize, Colombia, Panama, West Indies.
Notes—Contracts when touched. Scale = 1 cm. Photo by M. C. Díaz.

Aiolochroia crassa Hyatt, 1875

Identification—Massive to lobate. Bright yellow, brown, or purple externally, yellow internally. Surface has knob-shaped conules (3-4 mm high, and up to 1 cm apart). Dense like cheese. Oscules with membranes (1-2 cm wide) on top of lobes.
Distribution—Open reef and seagrass (3-30 m deep). Caribbean, Bermuda, and Brazil.
Notes—Out of the water the specimens turn dark purple to black. Scale = 5 cm. Photo by M. C. Díaz.

Aplysina cauliformis Carter, 1882

Identification—Ramose, with erect or repent branches (0.5-3 cm wide and 20-60 cm long). Brownish-pink to purple externally, tan internally. Microconulose surface (0.1-0.2 mm high, <0.5 mm wide). Skeletal mesh with mean area of 0.4 mm^2.
Distribution—Common on reefs, 2-20 m deep. Caribbean, Bermuda, Brazil.
Notes—Similar to *A. fulva*, but oscules usually in rows and much tighter mesh system. Scale = 8 cm. Photo by M. C. Díaz.

Aplysina aff insularis

Identification—Massive with digitate projections (1-3 cm long and 0.5-3 mm wide). Yellow with reddish spots externally, and yellow internally. Compressible. Microconulose surface with membrane-bearing oscula (3-6 mm wide).
Distribution—Panama.
Notes—*A. insularis* has single or aggregated tubes >10 cm high and longer fistulose projections. Further study is required to evaluate this species. Scale = 2 cm. Photo by M. C. Díaz.

Aplysina fulva (Pallas, 1776)

Identification—Ramose, with erect branches mostly (up to 2 cm wide, and 20-60 cm long). Bright yellow to ochre externally, and bright yellow internally. Surface conulose (0.5 mm high, 1 mm wide). Fiber network with meshes of 1 mm^2 in mean area.
Distribution—Open reefs, 2-15 m deep. Caribbean, Bermuda, Brazil.
Notes—Hard to distinguish from *A. cauliformis*. Oscules tend to be spread all around the branches. Turn black when out of the water. Scale = 4 cm. Photo by M. C. Díaz.

Aplysina lacunosa (Lamarck, 1815)

Identification—Hollow cylinders (up to 1 m high). Surface with deep grooves (0.5-1 cm deep), and finely conulose (0.5 mm high and 0.5-1 m apart). Yellow, green, ochre, or reddish-brown, externally, tan-yellowhish internally. Oscules with membrane on top of of the tube (2-8 cm in diameter). Compressible but tough.
Distribution—Deeper parts of reefs (> 5 m deep). Caribbean, Brazil.
Notes—In Bocas the species occurs shallower that in other Caribbean localities reported. Scale = 5 cm. Photo by M. C. Díaz.

Verongula rigida (Esper, 1794)

Identification—Massive-lobate, with membrane-bearing oscula (up to 3 cm wide). Yellow, to reddish-brown externally, and bright yellow internally. Surface with ridges (up to 5 mm high), that run straight, or sinuously, forming angular to honeycomb patterns.
Distribution—Common on open reef habitats more than 3 m deep. Caribbean, Florida, Brazil.
Notes—The sponge turns black when taken out of the water. Scale = 10 cm. Photo by M. C. Díaz.

Verongula reiswigi (Alcolado, 1984)

Identification—Tubes almost as wide as tall (10-15 cm high). Green with yellow, and bluish spots externally, yellow internally. Surface with ridges (2-4 mm high) that run parallel, or sinuously. Soft in consistency. Turns black when taken out of the water.
Distribution—Open reef, rare. Cuba, Panama, Belize.
Notes—Scale = 10 cm. Photo by M. C. Díaz.

Spongia tubulifera Hyatt, 1877

Identification—Massive sponge with oscular tubes (5 mm wide, 5-10 mm high). Brown to black in color externally, tan internally. Conulose surface, some tubercule-like projections (few mm high, 2-3 mm wide). Compressible.
Distribution—Common to rare on mangrove roots. Wide Caribbean, Florida, Mexico, North and South Carolina.
Notes—This species is similar to *Spongia pertusa* but is easily differentiated by its oscular tubes and tubercule like prominences found on the surface. Scale = 2 cm. Photo by M. C. Díaz.

Spongia pertusa Hyatt, 1877

Identification—Massive-amorphous to globular. Black externally and tan internally. Surface smooth to the eye, but microconulose under the microscope (conules 0.2 mm high, 1 mm apart). Membrane-bearing oscula (0.5-1 cm) dispersed irregularly over the sponge body. Compressible, easy to cut.
Distribution—Common on mangrove roots. Caribbean, Florida, Brazil.
Notes—Scale = 2 cm. Photo by K. Rützler.

Hyrtios proteus (Duchassaing & Michelotti, 1864)

Identification—Massive-amorphous to globular. Black externally, tan internally. Surface with conules 2-3 mm high, 1-4 mm apart. Membrane-bearing oscules (1-5 mm wide) scattered or on mound-like elevations. Compressible, tough to tear. Overgrown by other organisms.
Distribution—Common on mangrove, seagrass, and shallow reefs (0.5-5 m deep). Caribbean, Florida, Gulf of Mexico.
Notes—Similar to *Spongia* species but tougher. Scale = 10 cm. Photo by M. C. Díaz.

Ircinia campana (Lamarck, 1816)

Identification—Vase shaped. Reddish brown externally, tan internally. Oscules (1-5 mm wide) on the inner side. Surface conulose (1-5 mm high, 2-9 m apart). Compressible in consistency, tough to cut.
Distribution—Rare on mangroves, and reefs (5-15 m deep). Wide Caribbean, Florida, Gulf of Mexico, North Carolina.
Notes—All *Ircinia* spp. have a characteristic foul odor. Scale = 8 cm. Photo by M. C. Díaz.

Ircinia felix **((Duchassaing & Michelotti, 1864))**
Identification—Massive-amorphous, globular, encrusting, flabellate or ramose. Reddish-brown to grey externally and tan internally. Conulose surface (1-2 mm high, 2-3 mm apart). Membrane-bearing oscules (1-8 mm wide), with white or dark rims, scattered. Compressible but extremely tough to be cut.
Distribution—Common on mangroves, and shallow reefs**.** Caribbean, Bermuda, Florida, Gulf of Mexico, Brazil, North Carolina**.**
Notes—Scale = 12 cm. Photo by M. C. Díaz.

Ircinia strobilina **(Lamarck, 1816)**
Identification—Massive-globular with large sharp conules (up to 5 mm high) regularly spaced (up to 13 mm apart). Membrane-bearing oscules (2-15 mm wide) usually grouped onto a depression on top of the sponge. Dark gray to black externally, tan internally. Tough very hard to cut.
Distribution—Common on shallow reefs and seagrass beds**.** Caribbean, Bermuda, Florida, Gulf of Mexico, Brazil.
Notes—Scale = 15 cm. Photo by M. C. Díaz.

Dysidea etheria **De Laub., 1936**
Identification—Encrusting, to massive amorphous, or ramose. Grayish, bright blue externally, light blue to tan internally. Conulose surface (comules 1mm high, 2-3 mm apart). Membrane-bearing oscules scattered (1-5 mm wide). Soft and easily torn.
Distribution—Common on mangrove roots. Caribbean, Gulf of Mexico, Bermuda.
Notes—Scale = 2 mm. Photo by M. C. Díaz.

Halisarca caerulea **Vacelet & Donadey, 1989**
Identification—Thin encrusting sponge (1-2 mm in thickness), with a bright intense distinct cobalt blue, externally and internally. Smooth, and slippery surface, with regularly dispersed oscula (2-3 mm in diameter). A conspicuous star-shaped canal system surrounds each oscula.
Distribution—On dead coral in reef environments (2-15 m deep). Guadeloupe, Martinique, Belize, Panama.
Notes—No spicular skeleton. Scale = 1 cm. Photo by S. Duran and M. Becerro.

?Halisarca sp.

Identification—Thin encrusting (1-2 mm thick), smooth surface and leathery in consistency. Color tan externally and internally. Oscules not visible.
Distribution—Common on mangrove roots of internal lagoons and canals. Seem to overgrow many organisms.
Notes—A histological study of choanocyte chambers morphology will clarify its assignation of this aspicular to the family Halisarcidae. Scale = 3 cm. Photo by M. C. Díaz.

Chelonaplysilla erecta (Row, 1911)

Identification—Thinly encrusting (1-10 mm thick), dark brown, to black in color. Surface with low conules (1 mm high, few mm apart), and oscules bearing a collar-like membrane (1-4 m wide). Very soft in consistency.
Distribution—Rare to common, on mangroves roots. Panama, Colombia, Venezuela, Curaçao, Puerto Rico, Mediterranean and Red Sea.
Notes—Conspecificity of amphi-Atlantic populations must be evaluated. Scale = 2 cm. Photo by M. C. Díaz.

Haliclona (Rhizoniera.) curacaoensis (van Soest, 1980)

Identification—Thick crust with or without oscular mounds (1-4 cm thick, 2-4 cm high). Gray to bluish-purple externally, lighter color internally. Oscula 0.5-1 cm wide. Smooth, strongly punctuate surface, almost hispid looking. Soft, sticky to the touch.
Distribution—Common on mangrove roots, and corals. Caribbean, Florida, South Carolina.
Notes—Scale = 1.5 cm. Photo by K. Rützler.

Haliclona (Reniera) implexiformis (Hechtel, 1965)

Identification—Mounds or cushions (2-4 cm thick), pinkish to violet externally, lighter internally. Smooth, punctutate surface, sometimes with small tubercules (1-2 mm high, 1 mm wide). Compressible, but soft. Oscules scattered (5-10 mm wide).
Distribution—Caribbean, Bermuda.
Notes—Scale = 4 cm. Photo by M. C. Díaz.

Haliclona (Reniera) manglaris Alcolado, 1984

Identification—Thinly encrusting to small mounds (<1-3 mm thick) with volcano-like oscular elevations (1-2 mm high, 0.4-1.2 cm wide). Oscules small (1-3 mm). Commonly stolons branch off main body. Bright to drab turquoise green. Surface smooth and punctuate. Soft.
Distribution—Common on mangrove roots and other sponges. Caribbean, Florida.
Notes—One of the most frequent mangrove species. Scale = 2 cm. Photo by M. C. Díaz.

Haliclona (Reniera) mucifibrosa de Weerdt et al., 1991

Identification—Massive to lobate sponge, typically 10-15 cm in diameter, from which thick-walled oscular chimneys (3-5 cm high) arise. Oscules 0.5-2 cm in diameter. Surface smooth. Consistency elastic compressible but easily torn; pronounced mucus strands appear when fragments are torn apart.
Distribution—In Bocas found only on the top of the peat bank. Caribbean and Florida.
Notes—Scale = 3 cm. Photo by M. C. Díaz.

Haliclona (Reniera) tubifera (George & Wilson, 1919)

Identification—Cushion-like base (< 5 mm thick) with oscular chimneys (0.5-5 cm long). Thin long proliferations branching off the main body (1-2 mm wide, several cm long). Highly variable color from pink, to violet, or purple externally and internally. Oscules 0.5-1 mm wide. Soft. Smooth and slightly punctuated.
Distribution—Caribbean, Carolinas, Florida, Bermuda.
Notes—Very variable color and shape. Scale = 2 cm. Photo by M. C. Díaz.

Haliclona (Halichoclona) vansoesti de Weerdt, Kluijver, & Gomez, 1999

Identification—Massive to thick cushions, 2-8 cm thick. Circular to elliptical oscula, 0.5-1 cm wide, with raised whitish to transparent rims. The sponge is white to transparent externally and light-blue internally. Crisp, hard, and fragile in consistency.
Distribution—Occasional on reef environments, Jamaica, St. Vincent, Martinique, Bocas del Toro.
Notes—First record for Panama. The color pattern is very characteristic. Scale = 1.5 cm. Photo by M. C. Díaz.

Haliclona (S.) twincayensis de Weerdt et al., 1991

Identification—Thin erect branches (2-12 mm wide, 5-10 cm long). Oscula inconspicuous, 1mm wide along branches. Smooth surface. Compressible but fragile in consistency. Whitish gray to purplish externally, tan internally.
Distribution—Rare on mangroves roots and peat. Caribbean, Florida.
Notes—Delicate appearance. Scale = 4 cm. Photo by M. C. Díaz.

Haliclona (S.) piscaderaensis van Soest, 1980

Identification—Thick to thin encrusting (1-5 mm thick). Oscules (2-4 mm wide), volcano shaped, with transparent membranes. Whitish to yellowish or light purple in color. Soft and fragile, almost crunchy to the touch. C-shaped sigmas abundant.
Distribution—In Bocas, common on mangroves roots, while in other localities it is reported from cryptic reef habitats and seagrass beds as well. Colombia, Curaçao, Panama, Venezuela.
Notes—Scale = 4 cm. Photo by M. C. Díaz.

Haliclona (S.) vermeuleni de Weerdt, 2000

Identification—Thick encrusting with oscular chimneys, hollow fistules, digitate projections, and lobes (1.5 cm high, 1-5 mm wide). Oscules (1-2 mm wide) at end of chimneys or spread on projections. Blue internally and externally.
Distribution—Rare on mangrove roots. Caribbean, North Carolina, Bermuda.
Notes—Blue specimens of *H tubifera* and *H. caerulea* can be confused with *H. vermeuleni*. The sigmas in the later allow its distinction. Scale = 5 cm. Photo by M. C. Díaz.

Haliclona n. sp. 1

Identification—Thin (1-2 mm thick) crusts on the rubble (up to 100 cm^2). Dark brown-red to purple externally, tan internally. Smooth surface. Oscules (1-2 mm wide), with transparent membranes and short radiating canals. Soft, easy to peel from substrate.
Distribution—Reefs on rubble, commonly overgrowing other species. Bocas del Toro, Panama.
Notes—This species is distinct from the other two other dark purple *H. melana*, and *H. luciencis*, by its thin habit, and its oscular morphology. Scale = 4 cm. Photo by M. C. Díaz.

Chalinula molitba de Laubenfels., 1949

Identification—Clusters of hollow tubes, ramose solid branches (5-20 mm thickness, and up to 15 cm high), or cushions (1-3 cm thick). Oscula on side of branches or on top of hollow tubes (2-5 mm wide). Bright pink to brownish externally, lighter to tan internally. Soft and limp in consistency. Surface microhispid.
Distribution—On mangrove habitats, and under coral rubble. Caribbean, Florida, North Carolina, Georgia, Canary Islands.
Notes—Scale = 10 cm. Photo by M. C. Díaz.

Amphimedon compressa Duchassaing & Michelotti, 1864

Identification—Ramose to flabelliform. Branches cylindrical or slightly flattened (>2 cm in diameter). Oscules (3-4 mm wide) along branches rims. Surface smooth, except on the rims where it might be tuberculate or ridged. Tough but compressible in consistency.
Distribution—Common on shallow reefs, rare on mangrove roots. Caribbean wide.
Notes—Scale = 10 cm. Photo by M. C. Díaz.

Amphimedon erina de Laubenfels, 1936

Identification—Massive lobate to ramose. Color dark green externally, lighter internally. Surface smooth with oscular chimneys (0.5-1 cm in diameter). The species is compressible but crumbly in consistency.
Distribution—Common on shallow reefs, seagrass beds, and mangroves. Caribbean.
Notes—Hard to distinguish from *A viridis. A. erina* is darker, tougher, has much less sponging, and larger spicule dimensions. Scale = 2.5 cm. Photo by M. C. Díaz.

Amphimedon viridis Duchassaing & Michelotti, 1864

Identification—massive to repent branches (1-3 cm in diameter). Volcano-shaped Oscules (2-5 mm). Light green externally and internally. Soft and compressible in consistency.
Distribution—Rare species, found on shallow reefs and seagrass beds. Caribbean, Carolina del Norte, Bermuda, Indian Ocean, West central Pacific.
Notes—Easily distinguished from *A. erina* when observed side by side. However the true specific nature of these species must be proved genetically. Scale = 1.5 cm. Photo by M. C. Díaz.

Niphates erecta Duchassaing & Michelotti, 1864

Identification—Ramose to massive-encrusting. Branches 1-2 cm wide. Light grayish, pink, or purple, externally, lighter internally. Surface from smooth to extremely spiny, with or without zooanthids. Oscules (2-7 mm in diameter). Spongy but tough in consistency.
Distribution—At Bocas common both in the reef and in the mangroves. Common Caribbean wide.
Notes—Mangrove specimens are lighter in color and with a more punctuated surface. Photo by M. C. Díaz.

Niphates caycedoci Zea & van Soest, 1986

Identification—Thick crusts (2-6 cm in thickness), with compound oscules (3-6 mm in diameter) on top of low mounds. Grayish-blue externally, lighter to tan internally. Surface punctuated similar to *Niphates erecta,* with or without white zooanthids (*Parazoanthus* sp). Hard-compressible in consistency.
Distribution—Colombia, and Bocas del Toro, Panama.
Notes—Originally described as a *Xestospongia* species. Scale = 5 cm. Photo by M. C. Díaz.

Aka coralliphagum (Rützler, 1971)

Identification—Yellow tubes bearing oscula (1-6 cm high, 0.9-3 cm wide) coming out of dead coral, with or without tissue covered by inhalant papilla. Excavating sponges, bright yellow sometimes with reddish tinges externally, and lighter yellow internally Surface microhispid, and sinous. High quantities of mucus released when broken.
Distribution—On coral reefs, usually under 5 m in depth. Caribbean wide.
Notes—Scale = 2 cm. Photo by S. Nichols.

Oceanapia nodosa (George & Wilson, 1919)

Identification—Thin to thick crusts (0.5-3 cm) with a large number of fistules and oscular tubes (5 mm in diameter, 3-5 cm long) departing from it. Tubular walls paper thin, semitransparent. White, or tan externally and internally.
Distribution—Mangrove roots. Caribbean, Gulf Coast, and North Carolina.
Notes—Scale = 9 cm. Photo by M. C. Díaz.

Oceanapia peltata (Schmidt, 1870)

Identification—Massive globular buried under the sand with projecting cylindrical fistules that have smooth ends, or pagoda-shaped projections (2-4 cm wide, 1 mm thick). Dirty-white to cream in color.
Distribution—In Bocas del Toro the species is on seagrass beds (1-3 m deep). The species is reported from 50-100 m deep. Colombia, Florida, Cuba, and Bocas del Toro, Panama**.**
Notes—Water goes in though fistules, and is expelled through the buried mass. Scale = 2 cm. Photo by M. C. Díaz.

? Xestospongia n. sp. 1

Identification—Thin encrusting (.2-4 mm thick, <100 cm^2 wide). Dark red-purple externally and internally. Smooth surface with oscules (1-2 mm wide) on low volcano mounds. Crumbly in consistency. Endosymbiotic filamentous cyanobacteria.
Distribution—Rare; on mangrove roots, empty shells, and coral rubble. Bocas del Toro, Panama.
Notes—This species is thicker, and brittle compared to *Haliclona* sp. 1. Scale = 2 cm. Photo by M. C. Díaz.

Xestospongia muta (Schmidt, 1870)

Identification—Barrel shaped, with thick walls. Purple to red-brown externally, tan internally. Surface with protuberances with round or blade-like outlines. Brittle and crumbly in consistency. Oscules on the inner side of vase (2-3 mm wide).
Distribution—Common on reef environments, in Bocas del Toro under 5 m deep. Wide Caribbean.
Notes—Scale = 8 cm. Photo by M. C. Díaz.

Xestospongia proxima (Duchassaing & Michelotti, 1864)

Identification—Thick crusts (1-4 cm in thickness), or sprawling masses with lobes. Color red-brown to pink externally, and tan to yellowish internally. Oscules (3-10 mm in diameter). Smooth surface, sometimes with zoanthids. Hard and fragile in consistency.
Distribution—Common on reef environments, coral rubble, seagrass beds. Colombia, Brazil, Puerto Rico, Virgin Islands, Bocas del Toro (Panama).
Notes—Highly variable in shape. Scale = 10 cm. Photo by M. C. Díaz.

Xestospongia rosariensis Zea & Rutzler, 1983

Identification—Cylindrical tubes (4-78 cm high, 2-13 cm wide) emerge from basal mass. Dark reddish-brown externally, tan internally. Hard and dense. Smooth to the touch, with rugose and uneven parts, sometimes covered by zooanthids. Oscules on the inner wall of tubes (0.6-3.4 mm wide).
Distribution—On coral outcrops, and reef environments (2-30 m deep). Nuestra Señora del Rosario Archipelago, Colombia, Bocas del Toro, Panama.
Notes—Highly variable in shape. It harbors social shrimp in their canal system. Scale = 8 cm. Photo by M. C. Díaz.

Xestospongia subtriangularis (Duchassaing, 1850)

Identification—Ramose, branching species similar in growth pattern to the hard coral *Acropora cervicornis*. Branches 1-2 cm in diameter, and more than 20 cm high. Hard and fragile in consistency. Smooth surface, with oscules (2-5 mm) regularly distributed.
Distribution—On reef, seagrass beds, and sandflats habitats (>3 m deep). Caribbean wide.
Notes—Large patches (>2 m in diameter) may be found in Bocas (>4 m deep). Scale = 10 cm. Photo by M. C. Díaz.

Xestospongia carbonaria (Lamark, 1814)

Identification—Massive, lobate to repent branches with fistules that break off easily. Black externally and internally. Smooth surface with scattered membrane bearing oscules (3-5 mm in diameter), located on top of volcano-shaped elevations. Brittle to pulpy in consistency.
Distribution—Very common between coral rubble, in shallow reefs, seagrass beds, and mangroves. Caribbean wide, and Pacific ocean.
Notes—Scale = 4 cm. Photo by M. C. Díaz.

Calyx podatypa (de Laubenfels, 1934)

Identification—Ramose to lobate repent masses, mostly hollow, with tubular deformed projections. Round oscules (1-5 mm in diameter). Brown-yellowish to greenish externally and tan internally. Firm but fragile and brittle in consistency.
Distribution—Common between coral rubble in shallow reefs, seagrass beds, and between sponges on mangrove roots. Colombia, Puerto Rico, Belize.
Notes—Scale 4 cm. Photo by M. C. Díaz.

Callyspongia vaginalis Duchassaing & Michelotti, 1864

Identification—Cylindrical, to funnel shaped tubes (5-30 cm high, 1-10 cm in diameter, 1-10 mm thick). Gray in color, with golden, pink or greenish tinges. Surface smooth or with thorn –like conules (up to 10 mm high, 3-10 mm apart). Compressible and elastic.
Distribution—Common on reefs**.** Caribbean, Bermuda, Brazil.
Notes—Scale = 6 cm. Photo by M. C. Díaz.

Agelas dispar (Duchassaing & Michelotti, 1864)

Identification—Massive, roundish, occasionally lobate (up to 30 cm wide). *A. dispar* has been reported in two distinct color forms: bright orange, and reddish to walnut-brown externally, lighter orange or tan internally. The surface is smooth. There are three intergrading kinds of oscules: (1) meandering invaginations, 1-3 mm wide, up to 5 cm long, (2) circular oscules, 2-7 mm in diameter, (3) smaller, circular to elongate, 1-2 mm wide, flush.
Distribution—Coral reefs, usually below 10 m in depth. Caribbean wide.
Notes—Scale = 4 cm. Photo by S. Duran and M. Becerro.

Agelas clathrodes (Schmidt, 1870)

Identification—Massive, flabellate, rising from a narrow base (1.5 to 10 cm thick). Bright red-orange externally, lighter internally. The margin is rounded, or indented. Compressible, resilient. The surface is rough to the touch to verrucose, with abundant membrane-bearing oscula (2-5 mm diameter).
Distribution—Coral reefs, usually below 10 m in depth. Caribbean wide.
Notes—Scale = 5 cm. Photo by S. Duran and M. Becerro.

Agelas conifera (Schmidt, 1870)

Identification—Clusters or single tubes (up to 0.5 m long and 10-20 cm in diameter). Light to purplish brown externally, yellow to tan internally. The surface is smooth, with meandering groves occasionally. Oscules on the inner walls of the tubes few millimeters in diameter.
Distribution—Coral reefs, usually below 10 m in depth. Caribbean wide.
Notes—Scale = 5 cm. Photo by S. Duran and M. Becerro.

Lissodendoryx issodictyalis (Carter, 1882)

Identification—Amorphous to lobate. Yellow, green or blue externally, tan internally. Conulose and rugose surface with oscules on top of lobes with dermal canals. Compressible.
Distribution—Mangroves roots, among seagrass blades, or *Halimeda*. North Carolina, Caribbean, Pacific coast of Mexico, Mediterranean and Indian ocean.
Notes—Scale = 4 cm. Photo by M. C. Díaz.

Lissodendoryx colombiensis Zea & van Soest, 1986

Identification—Massive amorphous (10-30 cm thick). Yellow to orange externally, and internally. Surface smooth to slightly rugose. Large oscules with membranes (0.5-3 cm in diameter), and smaller ones (1-3 mm). Compressible, easy to break apart.
Distribution—Reefs, and mangrove roots. Colombia, Panama, Belize.
Notes—Scale = 8 cm. Photo by M. C. Díaz.

Monanchora arbuscula (Duchassaing & Michelotti, 1864)

Identification—Encrusting, massive (0.2-4 cm) or ramose (50-80 cm high). Dark red externally and internally. Surface has a transparent-whitish membrane, with radial canals that converge in oscula (0.3-2 cm in diameter).
Distribution—Common species in shallow reefs. In cryptic habitats it grows as thin crust. Caribbean wide.
Notes—*M. barbadensis*, and *M ungifera* are junior synonyms of this species. Scale= 8 cm. Ramose form (scale = 8 cm) and thick encrusting form (Scale = 2 cm) shown. Photo by M. C. Díaz.

Tedania ignis (Duchassaing & Michelotti, 1864)

Identification—Massive amorphous to lobate, with smooth, to tuberculate surface. Bright red or orange red. Oscules (1-2 cm wide) on top of lobes. Soft, compressible, easily torn.
Distribution—Shallow reefs, mangroves, and seagrass beds. Very common in the Caribbean.
Notes—*Tedania ignis* (Duchassaing & Michelotti, 1864) is well known as the "Fire sponge". A lighter orange "chimera" between *Tedania ignis* and a *Mycale (Paresperella)* sp. is found on Bocas del Toro mangroves. Scale = 4 cm. Photo by M. C. Díaz.

Iotrochota birotulata **(Higgin, 1877)**
Identification—Sprawling ramose branches, with spiky surface (up to 60 cm long, 1-5 cm wide). Black with green patches internally and externally. Tough, compressible in consistency. Membrane bearing oscula 1-3 mm in diameter, on side of branches.
Distribution—Reef, mangrove and seagrass environments. Caribbean wide, Florida, and apparently on the Indopacific.
Notes—Many specimens with yellow zoanthids. Scale = 4 cm. Photo by M. C. Díaz.

Desmapsamma anchorata **(Carter, 1882)**
Identification—Upright, somewhat ramose masses with oscules (1-5 mm in diameter) on elevations or sprawling clumps of volcano-shaped oscular tubes. Variably pale purplish pink to salmon colored. Consistency compressible, rather soft and slimy.
Distribution—Shallow reef habitats and lagoons**.** Caribbean wide, and tropical Atlantic.
Notes—Scale = 2 cm. Photo by M. C. Díaz.

Biemna caribaea **Pullitzer-Finalli, 1986**
Identification—Encrusting (3-6 mm) to branching ramose sponge. Light soft yellow to orange externally and internally. Very soft to the touch, porous surface. Oscules dispersed, with slightly elevated transparent membranes (1-4 mm wide). Compressible easy to break.
Distribution—Exclusively found on mangrove roots. Colombia, Belize, Panama, Florida, Puerto Rico, Bonaire.
Notes—Scale= 1.5 cm. Photo by M. C. Díaz.

Neofibularia notilangere **(Duchassaing & Michelotti, 1864)**
Identification—Thick encrusting (0.4-3 cm), or massive to large vases (up to 80 cm wide and high). Brown-red in color externally, tan internally. Surface varies from smooth and porous, to corrugated and microhispid, somewhat velvety. Oscules dispersed (3-6 mm wide). Firm but very fragile.
Distribution—On reef environments, usually under 5 m deep. Caribbean wide.
Notes—A very toxic species. Do not touch it with the bare skin! In Bocas it overgrows other reef species aggressively. Scale = 4 cm. Photo by M. C. Díaz.

Mycale laevis (Carter, 1882)

Identification—Thick cushions (5 cm) sometimes with branches (1-10 cm wide, up to 50 cm tall). Orange-yellow externally, lighter internally. Rough surface with oscula with white strands on membranes (up to 4 cm wide). Compressible.
Distribution—In reefs throughout the Caribbean encrusting the undersides of corals. Occasionally in mangroves where it can grow to record size.
Notes—White-"albino" specimen shown. Scale = 10 cm. Photo by M. C. Díaz.

Mycale laxissima (Duchassaing & Michelotti, 1864)

Identification—Tubular to globular, solitary or in clusters, thin-walled (1-2 cm), up to 50 cm tall. Large pseudoscule with transparent membrane (3-6 cm wide). Dark wine red to black. The surface is spiny. Tough but compressible. Releases sticky mucus released when squeezed.
Distribution—Reefs, mangrove peat banks, occasionally on roots.
Notes—An association with two algae (*Ostreobiium* cf. *constrictum* Lucas a Chlorophyta, and *Acrochetum spongicolum* Weber-van Bosse, Rhodophyta) living within the sponging fibers of *M. laxissima* was found among Belizean specimens. Scale = 4 cm. Photo by M. C. Díaz.

Mycale microsigmatosa Arndt, 1927

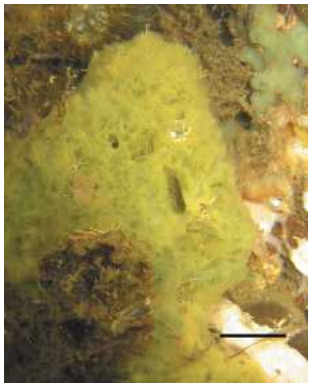
Identification—Encrusting (0.2-5 cm thick), soft and fragile. Color variable, from reddish orange to gray. Distinctive bright orange specks scattered throughout the surface.
Distribution—Very common species, ecrusting mangrove roots, also found on pipes or piles. Bahamas, Belize, Bonaire, Cuba, Curaçao, Margarita, Florida, Jamaica.
Notes—Scale = 2 cm. Photo by M. C. Díaz.

Mycale magniraphidiphera van Soest, 1984

Identification—Encrusting, up to 5 mm thick, very soft and fragile. Raised dermal canals converge to oscula with transparent membranes (1-3 mm in diameter). Bluish, pinkish or creamy yellowish in shaded zones.
Distribution—Rare, encrusting mangrove roots. North Carolina, Curaçao, Belize, Panama.
Notes—Tends to colonize the tip of young mangrove roots. Scale = 5 cm. Photo by M. C. Díaz.

Mycale carmigropila Hadju & Rützler, 1998

Identification—Thin-encrusting (2-3 mm thick). Color cobalt blue, light green, or cream-yellowish. Dermal canals visible, converging to the oscula in a star-like pattern. Surface smooth, and slimy. Some specimens have a tangential ectosomal reticulation, that can be "peeled-off". Soft and fragile.
Distribution—Rare, on mangrove roots or intermingled with the algae *Halimeda*. Belize, Panama.
Notes—Scale = 5 cm. Photo by M. C. Díaz.



Mycale citrina Hajdu & Rützler, 1998

Identification—Thin-encrusting (3-6 mm in thick). Lemon yellow to orange. Numerous pronounced dermal channels converge towards collared-transparent oscula (1-3 mm wide). Very soft and fragile, releases copias amounts of mucus upon handling.
Distribution—Common on mangrove overhangs and, peat banks protected from direct sunlight. Belize, Panama, and Venezuela.
Notes—Scale = 2 cm. Photo by M. C. Díaz.

Mycale (*Paresperella*) sp.

Identification—Massive crusts (1-3 cm thick) with irregularly shaped branches or lobes (3-10 cm high, 1-3 cm thick). Bright red-orangish externally, lighter internally. Smooth and leathery surface. Oscules (1-1.5 cm) in diameter, with transparent membranes that display white strands. Compressible and soft.
Distribution—Only known from Bocas del Toro, Panama.
Notes—Similar appearance with *Tedania ignis*. Sometimes yellow zooanthids (*Parazoanthus* sp) infest the sponge surface.The species is being described by Díaz. Scale = 4 cm. Photo by M. C. Díaz.

Clathria (Thalysias) venosa (Alcolado, 1984)

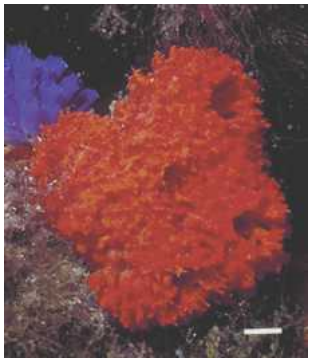
Identification—Thin crust (1-2 mm in thickness). Gray to cream externally and internally. Oscules with transparent membranes (3-4 mm in diameter), from which thin canals (1 mm) depart radially. Smooth and slippery surface.
Distribution—Common to rare on mangrove roots. Cuba, Belize, Panama.
Notes—Scale = 1 cm. Photo by K. Smith.

Clathria (T.) microchela

Discription—Thin encrusting (1-2 mm thick) with conspicuous vein-pattern of the canal system and oscules witn membranes (1-2 mm wide). Grayish blue color throughout. Consistency soft, slimy to touch.
Distribution—Rare, on mangrove roots and peat banks. Curaçao, Bonaire, Belize, Panama.
Notes—Scale = 1 cm. Photo by Kate Smith.

Clathria (Thalysias) shoenus (de Laubenfels, 1936)

Identification—Thinly encrusting (2-4 mm in thickness) to lobate, ramose, palmate or flabellate, with thin branches reaching 10-15 cm in height. Very characteristically colored externally orange to red with yellowish tinges. Very smooth, somewhat slippery surface. Soft and compressible in consistency.
Distribution—Curaçao, Bonaire, Puerto Rico, Jamaica, Florida, Belize, Panama.
Notes—Highly variable in shape and color. Scale = 4 cm. Photo by M. C. Díaz.



Clathria echinata (Alcolado, 1984)

Identification—Clusters or single vase-like tubes (5-15 cm high). Bright red to orange externally, and internally. Very spiky surface. Compressible but resilient to the touch.
Distribution—In Bocas del Toro on deeper edges of reefs (14-18 m deep) covered by mud. Elsewhere found on reefs under 10 m deep. Cuba, Panama, Belize.
Notes—Scale = 1.5 cm. Photo by M. C. Díaz.

Ectyoplasia ferox

Description—Massive, encrusting, to lobate (2-10 cm thick). Brown-yellowish to orange externally, lighter internally. Surface smooth or punctuated, sometimes rugose. Oscules with light membranes (0.2-1 cm in diameter), sometimes on chimney-like projections (1-2 cm high). Dense and compressible.
Distribution—Rare on seagrass beds, common on reefs (>4 m deep). Caribbean wide.
Notes—Scale = 2 cm. Photo by S. Nichols.

Dragmacidon reticulata (Ridley & Dendy, 1886)

Identification—Massive-amorphous, lobate, or mound-shape. Bright red externally and internally. Short conules (0.5 mm high) evenly dirtributed, or tall conules (1-2 mm high) irregularly distributed. Oscules abundant (3-6 mm in diameter), with a thin membrane. Slimy when cut.
Distribution—Reefs (0.5-70 m deep), and occasionally on mangrove roots. Caribbean wide. Very similar species occur in the South and Eastern Pacific**.**
Notes—Many specimens with yellow zoanthids. Scale = 4 cm. Photo by M. C. Díaz.

Scopalina ruetzleri (Wiedenmeyer, 1977)

Identification—Thin to thick encrusting (0.5-2 cm thick). Bright orange to yellowish orange, externally and internally. The surface is conulose. The consistency is very soft and limp.
Distribution—It is common on mangrove roots, and occasionally on peat banks, and on shallow reefs habitats. Caribbean wide.
Notes—Scale = 2 cm. Photo by K. Rützler.

Svenzea zeai

Identification—Massive lobate, to ramose (4-10 cm tic). Reddish brown externally, tan internally. Chimney-like oscule 1-2 cm wide. Smooth, punctuate surface. Soft, compressible.
Distribution—On reefs (>10 m deep). Colombia, Panama, Belize, Bahamas, Jamaica, Curaçao.
Notes—Sometimes with brown zoanthids. Scale= 2 cm. Photo by M. C. Díaz.

Halichondria lutea Alcolado, 1984

Identification—Massive encrusting body usually burrowing in the sand from which sharp and corrugated projections arise. (Up to 2 cm high and 0.5 cm wide). Orange to yellow externally, slightly lighter internally. Compressible but fragile.
Distribution—Growing on deeper areas of the reef over sandy and/or muddy bottoms, and is usually found covered by sediments. Cuba, Venezuela, Panama.
Notes—Scale = 1 cm. Photo by M. C. Díaz.

Halichondria magniconulosa Hechtel, 1965

Identification—Massive-amorphous to lobate, and fleshy. The surface varies from smooth, wrinkled, to having fistules-like projections (0.5 cm wide, and 0.5-1 cm long). It can be confused with *Lissodendoryx* (yellow form) or *Biemna* spp. but is easily distinguished in the field by touch. This species consistency is compressible and a clear detachable skin is present.
Distribution—Common on mangrove roots, on the bottom of mangrove creeks, and growing on peat banks. Caribbean wide.
Notes—Scale = 2 cm. Photo by M. C. Díaz.

Halichondria melanadocia de Laubenfels, 1936

Identification—Massive-amorphous to ramose, black to dark green externally, black with yellow tinges internally. Surface varies from smooth, to tuberculate to conulose. Oscules raised above the body (3-10 mm wide). Compressible to the touch. Smooth surface, with detachable skin.
Distribution—Shallow coastal environments, mangroves and seagrass beds. Caribbean wide. Photo by M. C. Díaz.
Notes—Highly variable in shape. Scale = 3 cm. Photo by M. C. Díaz.

Cinachyrella alloclada (Uliczka, 1929)

Identification—Globular sponge up to 10 cm wide, with blind concave depressions (porocalices), 3-15 mm wide; oscules (1-5 mm wide) sometimes visible on the top of the sponge. Orange to yellow externally, lighter internally.
Distribution—Florida, Bahamas North Carolina, Venezuela.
Notes—Scale = 1 cm. Photo by K. Rützler.

Cinachyrella apion (Uliczka, 1929)

Identification—Spherical to sub-spherical (up to 10 cm in diameter), yellow to gray externally, lighter internally. Surface strongly hispid or furry. Porocalices abundant (up to 3 mm wide). Oscules rare, 2-3 mm wide. Soft and compressible.
Distribution—On mangrove roots and peat (>0.3 m deep). North and South Carolina to Bermuda, southwestern Florida, Bahamas, Virgin Islands, Belize, Panama.
Notes—Scale = 2 cm. Photo by K. Rützler.

Geodia papyracea Hechtel, 1965

Identification—Massive (10-20 cm in diameter). Cream or light gray to dark brown externally (the color is from the cyanobacteria), tan internally. Consistency is pulpy and easily crumbled. Surface rough, and it may be wrinkled. Oscules (2-5 mm wide) aggregated.
Distribution—Rare. Found on mangrove roots and mangrove peat banks. Belize, Jamaica, Panama.
Notes—"Sick" mushy specimens due to extreme growth of cyanobacteria reported from Belize. Scale = 3 cm. Photo by M. C. Díaz.

Erylus formosus Sollas, 1886

Identification—Massive amorphous to lobate. Color black to purplish gray externally, tan internally. Very smooth skin that wrinkles when lifted out of the water. Consistency compressible and dense, easily torn.
Distribution—Rare species, exclusive of reef habitats, under 5 m deep. Bahamas, Belize, Venezuela.
Notes—A sister species *E. gofflieri* (Wiedenmayer, 1977) has a surface pierced by holes. Scale = 3 cm. Photo by M. C. Díaz.

Placospongia intermedia Sollas, 1888

Identification—Thick crust to branching. Brown to tan externally, lighter internally. Surface armored with cortical plates and a pattern of grooves wi the inhalant surface. Hard and tough.
Distribution—Rare, shallow reef and seagrass beds habitats. Jamaica, Bahamas, Belize, Panama.
Notes—Scale = 1.5 cm. Photo by S. Duran and M. Becerro.

Spirastrella coccinea Schmidt, 1868

Identification—Thin encrusting (1-5 mm) bright red sponge. Internally the color grades from red to brown or orange. Smooth surface, leathery to the touch. Small oscules (0.5-2 mm in diameter) often on small mounds, with star shaped transparent canals departing from the oscula.
Distribution—Rare species in between coral rubble, usually cryptic (1-15 m deep). Caribbean wide.
Notes—Vermillion bright red color allows clear distinction with other *Spirastrella* species. Scale = 2 cm. Photo by M. C. Díaz.

Spirastrella hartmani Boury-Esnault et al., 1999

Identification—Thick encrusting (up to 4 cm thick). Dull reddish to brown externally, lighter color internally. Smooth surface, leathery to the touch. Compressible in consistency.
Distribution—Common between and under coral rubble, in shallow reefs and seagrass environments (1-10 m deep). Caribbean.
Notes—This species represents what was referred in the literature as *S. cunctatrix* or *S* cf. *mollis* from Panama and elsewhere in the Caribbean. *S. cunctatrix* is very similar, but is a north Atlantic species with distinct genetic and skeletal identities. Scale = 1.5 cm. Photo by M. C. Díaz.

Spirastrella mollis Verill, 1907

Identification—Encrusting (3-5 mm thick), with meandering dermal canals that depart from large collared-oscula (0.5-2 cm). Milky-orange, yellowish to brownish red externally, lighter to yellowish internally. Consistency soft, surface smooth.
Distribution—Rare to common encrusting red mangrove roots, peat banks, and oyster shells.
Notes—Scale = 5 cm. Photo by M. C. Díaz.

Terpios manglaris Rützler y Smith, 1993

Identification—Thin encrusting (<1 mm). Star-shaped pattern of dermal canals depart from small oscula (1 mm wide). Vivid cobalt blue in color.
Distribution—Common on mangrove roots. Belize, Venezuela, Panama.
Notes—It is symbiotic with a filamentous blue-pigmented bacteria. Scale = 4 cm. Photo by M. C. Díaz.

Prosuberites laughlini (Diaz et al., 1987)

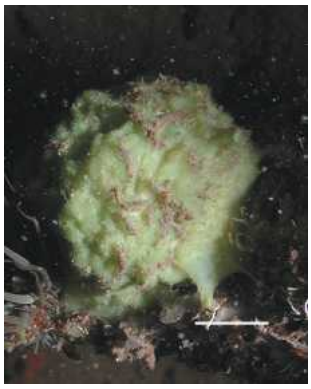
Identification—Encrusting (0.3-4 cm thick), dull orange to yellow externally, lighter internally. Surface visually smooth in thin specimens, rugose on thicker ones. Oscules with transparent membranes (1-6 mm in diameter) with thin (1-2 mm) canals departing radially. Soft and compressible, easy to tear.
Distribution—Common on reef's cryptic habitats, growing as thin crusts; rare on mangrove roots, where it grows thick. Belize, Panama, Venezuela**.**
Notes—Scale = 2 cm. Photo by M. C. Díaz.

Suberites auriantaca

Description—Massive lobate (4-10 cm thick) to ramose. Color variable, from red and orenage to yellow-green externally, orange-yellow internally. Smooth, highly contractile. Oscules 0.3-1 cm wide. Dense, and compressible.
Distribution—Common, on mangrove roots. Tropical Atlantic, tropical Pacific, Antilles.
Notes—Scale = 2 cm. Photo by M. C. Díaz.

Tethya aff. *seychellensis*

Identification—Purplish-red spheres, in clusters or solitary (2-5 cm wide). Reproductive buds (1-2 mm in diameter) on top of hair-like projections common. Verrucose surface and volcano shaped oscules with transparent membranes (2-5 mm in diameter). Internal color orange-red.
Distribution—Rare; found on mangrove roots or between seagrass blades. Venezuela, Panama.
Notes—This species was identified by Dr. M. Sara as *T. seychellensis* (Cipriani et al. 1994) a species from the Indian Ocean. Its conspecificity with the Caribbean species is highly dubious. Scale = 2 cm. Photo by M. C. Díaz.



Tethya actinea de Laubenfels, 1950

Identification—Globular, up to about 7 cm in diameter. Emerald to drab green, occasionally orange externally, lighter to orange internally. Tough, somewhat compressible. Verrucose surface. Volcano shaped oscules with transparent membranes (< 5 mm wide). Some specimens are covered with thin processes, and occasionally with buds.
Distribution—Common in mangrove and sea grass beds.
Notes—Scale = 1 cm. Photo by K. Rützler.

Spheciospongia vesparium (Lamarck, 1815)

Identification—Massive amorphous to cake shaped. Black externally, and internally. Surface with round low elevations. Large oscules (8-15 mm wide) and small oscules (1-2 mm wide) aggregated. Compressible but dense in consistency.
Distribution—Rare species, found on soft bottoms on reefs and seagrass habitats. North Carolina, Florida, Caribbean wide.
Notes—Scale = 9 cm. Photo by S. Duran and M. Becerro.

Cliona caribbaea Carter 1882 (= *C. langae* Pang, 1973)

Identification—Thin encrusting (2 mm thick) continuously covering the substratum. Brown to gray in color. Oscula (2-3 mm wide) with a cream colored rim. Papillae may be distinguished on small specimens or growing on rims.
Distribution—Mostly deeper than 6 m, sometimes in shallow rubble. Jamaica, Belize, Colombia, Panama.
Notes—Sponge excavates 0.7-1.3 cm into the coral skeleton. Occasionally colonized by yellow zoanthids. Scale = 2 cm. Photo by S. Duran and M. Becerro.

Cliona delitrix Pang, 1973

Identification—Encrusting with round to oval shaped papillae (2-5 mm wide, 1-2 mm high) excavates several cm (up to 10 cm) into the coral rubble. Orange reddish in color. Surface smooth, and velvety on papillae. Oscules with volcano-shaped membranes (1-3 cm in diameter, and 0.5 1 cm high).
Distribution—Very common species on shallow to deeper reefs (> 4 m deep). Caribbean wide.
Notes—Usually covered by white zoanthids. Scale = 6 cm.

Cliona tenuis Zea & Weil, 2003

Identification—Transparent brown, very thin tissue on coral rubble (up to several m. in diameter). Smooth surface with small and inconspicuous oscules (0.4-1.4 mm in diameter). Color light to dark brown with yellowish, reddish or greenish tinges.
Distribution—Common on shallow, wave exposed reef habitats at low (1-6 m deep) or mid depths (15-20 m), especially on *Acropora palmata* dead colonies.
Notes—Sponge excavates up to 2 cm into the coral skeleton. Scale = 1 cm. Photo by K. Rützler.

Cliona varians (Duchassaing & Michelotti, 1864)

Identification—Thin to thick encrusting (0.2-5 cm in thickness), or massive lobate. Smooth, velvety surface with oscules (0.2-3 cm in diameter) bearing cream colored membranes that are either flushed to the surface or elevated few mm from it. Firm and rubbery.
Distribution—Common species on reef and seagrass environments. Wide depth range (2-30 m). Large specimens on areas exposed to high currents. Caribbean wide.
Notes—Scale = 6 cm. Photo by M. C. Díaz.

Chondrilla nucula Schmidt, 1862

Identification—Thin to thick encrusting (0.2-4 cm) to massive amorphous. The surface is smooth, shiny, with oscules regularly distributed (0.2-1 cm wide). Dark brown to walnut brown or beige, externally, and tan internally. The consistency is soft, elastic, and tough.
Distribution—Thick on mangroves, and thin on coral reefs (5-20 m deep). Caribbean wide.
Notes—Asterose spicules present. Scale = 2 cm. Photo by S. Duran and M. Becerro.

Chondrosia collectrix Schmidt, 1862

Identification—Thick encrusting (1-5 cm) to massive amorphous**.** Black to dark brown or tan externally on parts unexposed to light, tan internally. Tough, firm, and cartilaginous. Surface smooth, and slimy. Oscules 0.2-1 cm wide.
Distribution—Occasionally found on mangrove roots and peat banks. Common on reefs and lagoons. Caribbean wide.
Notes—Very similar in appearance to *C. nucula*, but *C. collectrix* lacks spicules, is darker in color, and much tougher, and cartilagenous in consistency. Scale = 5 cm Photo by S. Duran and M. Becerro.

PHYLUM CNIDARIA

Millepora alcicornis Linnaeus, 1758

Identification—Multiple branches in a single plane with small pores from which the tiny polyps protrude. Tan or mustard with white tips and edges.
Distribution—Common throughout the Caribbean, in reefs and seagrass beds and occasionally on mangrove roots. Very common in shallow protected areas in Bocas del Toro where there can be solid beds of this species.
Notes—Painful stings that can develop into a painful rash or welts.

Millepora complanata Linnaeus, 1758

Identification—Color and texture similar to *A. alcicornis*, but colonies for thin, upright blades or plates that are somewhat branched.
Distribution—Common throughout the Caribbean in shallow reef habitats with surge or more flow that *A. alcicornis* habitats.
Notes—Painful stings that can develop into a painful rash or welts.

Millepora striata Linnaeus, 1758

Identification—Tan or mustard with white edges. This species forms short blades that often split to form small boxes.
Distribution—Rare throughout the Caribbean.
Notes—Painful stings.

Stylaster roseus Pallas, 1766

Identification—Small pink or lavender branched colonies. Often branches in only an single plane to make fan-shaped colonies.
Distribution—Common but inconspicuous on reefs throughout the Caribbean.

Acropora cervicornis (Lamarck, 1816)

Identification—Colonies of cylindrical branches that branch in three dimensions, often forming a dense tangle. Yellow-brown with tips of branches often white. Corallites form obvious bumps on branches
Distribution—Intermediate depths on reefs in low energy areas.
Notes—This species has suffered recent server mortality in many parts of the Caribbean. There are still healthy populations in Bocas del Toro.

Acropora palmata (Lamarck, 1816)

Identification—Characteristics flattened branches give this species it's common name (Elkhorn coral). Yellow-brown with white edges of branches.
Distribution—Throughout the Caribbean in shallow areas of high wave action, especially reef crests.
Notes—This species has suffered recent server mortality in many parts of the Caribbean. There are still healthy populations in Bocas del Toro.

Madracis decactis Lyman, 1859

Identification—Primarily encrusting colonies with raised fingers or lobes. Small raised corallites. Corallites have 10 primary septa.
Distribution—Common throughout the Caribbean and Southern Florida.
Notes—May be difficult to distinguish from other *Madracis* species in the field and is know to hybridize with *M. pharensis*.

Madracis miriabilis (Duchassaing & Michelotti, 1861)

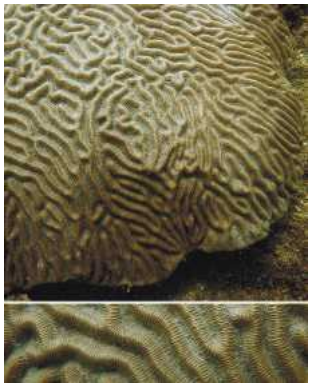
Identification—Colonies are clumps of densely packed thin fingers with rounded, blunt tips.
Distribution—Common throughout the Caribbean in deep clear water.
Notes—Common in the deeper reefs in Bocas del Toro.

Favia fragum (Esper, 1788)

Identification—Small, hemispherical colonies with large corallites. Edges or corallites do not protrude. Yellow-brown.
Distribution—Common in shallow (<15 m) reef habitats and sometimes in seagrass beds.
Notes—A new, currently undescribed species with large prodruding calicies also occurs in Bocas del Toro in shallow habitats.

Diploria labyrinthiformis (Linnaeus, 1758)

Identification—A hemispherical brain coral characterized by the deep, narrow, polyp-bearing valleys that are separated by grooved ridges. Valleys are often interconnected. Usually tan or yellow-brown.
Distribution—Common throughout the Caribbean and in Bocas del Toro.



Diploria clivosa (Ellis & Solander, 1786)

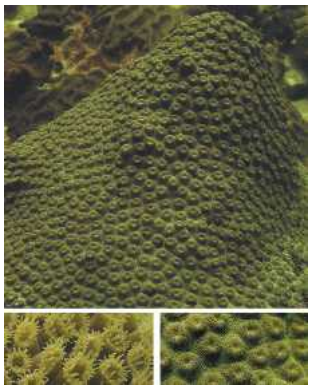
Identification—A domed or encrusting brain coral, often with protruding knobs. Ridges rise sharply and are not grooved. Valleys are broad. Green, brown or yellow-brown.
Distribution—Common throughout the Caribbean.

Diploria strigosa (Dana, 1846)

Identification—A domed or plate-like brain coral. Ridges are rounded and are not grooved. Valleys are broad and long. Green, brown or yellow-brown.
Distribution—Common throughout the Caribbean.

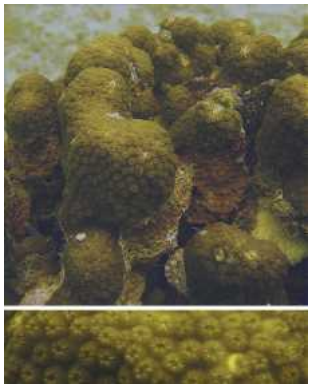
Colpophyllia natans (Houttuyn, 1772)

Identification—These brain corals can be encrusting or form domes or rounded plates. The ridges expand distinctly midway to the groove. A thin groove runs along the ridgetops. Brown, green or tan.
Distribution—Common throughout the Caribbean on reef tops.
Notes—Polyps feed nocturnally.



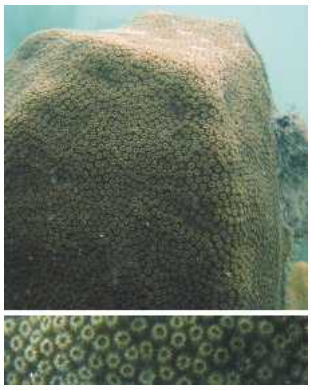
Montastraea cavernosa (Linnaeus, 1766)

Identification—Colonies massive. Often form huge mounds or boulders. Corallites are closely spaced and calices are distributed evenly. More septa than the other *Montastraea* species. Green, brown, yellow, pink or gray.
Distribution—Common throughout the Caribbean to a depth of 70 m.
Notes—Polyps feed nocturnally.



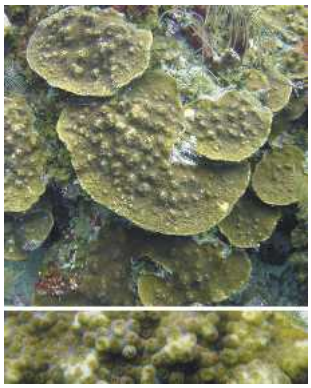
Montastraea annularis (Ellis & Solander, 1786)

Identification—Colonies form long, thick columns. Polyps cover the tops of the columns. Close-packed, raised corallites, Calices distributed evenly. Golden tan or greenish.
Distribution—Common throughout the Caribbean.
Notes—Spawns after the full moon in August and September in Bocas del Toro.



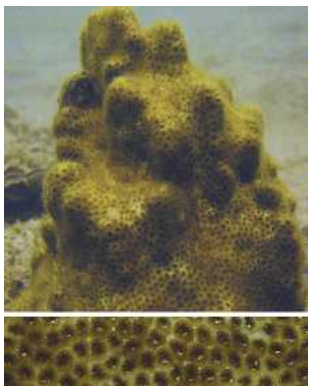
Montastraea faveolata (Ellis & Solander, 1786)

Identification—Massive mounds, generally smooth with bumps and ridges. Calices distributed evenly each with 24 septa. Grey, green or brown.
Distribution—Common throughout the Caribbean.
Notes—Spawns after the full moon in August and September in Bocas del Toro.



Montastraea franksi (Gregory, 1895)

Identification—Bumpy or uneven massive plates or crusts. Calices distributed unevenly each with 24 septa. Grey, green or brown.
Distribution—Common throughout the Caribbean.
Notes—Spawns after the full moon in August and September in Bocas del Toro.



Solenastrea bournoni (Milne-Edwards & Haime, 1849)

Identification—Colonies form large mounds or domes often with irregular bumps. Corallite rims protrude with extramural budding. Cream to tan.
Distribution—Can be common in Florida but is generally uncommon throughout the Caribbean. Generally shallow reefs.

Manicina areolata (Linnaeus, 1758)

Identification—Small (<10 cm), free-living, colonies that are either hemispherical with several valleys or elongate with a long, continuous central valley. Often Brown or yellow brown, sometimes green or gray.
Distribution—Throughout the Caribbean, can be common in sand, seagrass and coral rubble.

Oculina diffusa Lamarck, 1816

Identification—Clumps of thick branches with large raised corallites (3-4 mm in diameter). Yellow-brown but often encrusted and entangled with other organisms.
Distribution—Common or abundant in Florida and the northern Caribbean.
Notes—Similar to *Oculina tenella*.

Phyllangia americana (Milne-Edwards & Haime, 1849)

Identification—Small groups of individual polyps. Corallites (1-1.5 cm) are circular with 6 protruding primary septa and 6 secondary septa. Skeleton often surrounded by other encrusting organisms. Polyps are various shades of brown.
Distribution—Throughout the Caribbean and Southern Florida.

Stephanocoenia intersepta (Esper, 1795)

Identification—Colonies are encrusting or form small mounds. Rims of calices are darker than the background color. Corallites >2 cm with 24 septa can be widely spaced or closely packed. Often cream with brown calices.
Distribution—Throughout the Caribbean.
Notes—This species appears to blush as the polyps retract when disturbed.

***Mussa angulosa* (Pallas, 1766)**
Identification—Colonies of large fleshy polyps with corallite diameter 4-7 cm. Septa with large prominent teeth. Polyps close-packed with rough texture. Grey with overtones of blue, green or pink.
Distribution—Throughout the Caribbean.
Notes—Polyps feed at night.

***Scolymia cubensis* (Milne Edwards & Haime, 1849)**
Identification—Large (3-10 cm), solitary, fleshy polyps. Irregular attenuate or triangular septal teeth. Grey, brown green or blue-green.
Distribution—Occasional throughout the Caribbean on deep reefs and shaded walls.
Notes—Very similar to *Scolymia wellsi* in the field.

***Scolymia wellsi* (Zlatarski, 1982)**
Identification—Large (1-5 cm), solitary, fleshy polyps. Irregular attenuate or triangular septal teeth. Grey, brown green or blue-green.
Distribution—Occasional throughout the Caribbean on deep reefs and shaded walls.
Notes—Very similar to *S. cubensis* but smaller and spikier.

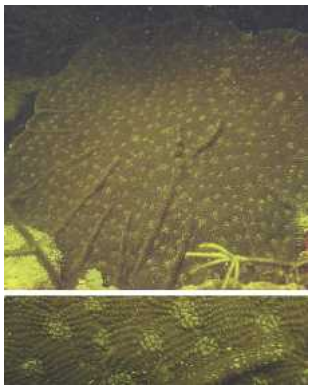
***Isophyllia sinuosa* (Ellis & Solander, 1786)**
Identification—Small domes with convoluted very fleshy ridges and narrow, convoluted valleys. discontinuous trabecular columellae. Color variable from yellow to green, brown or grey.
Distribution—Throughout the Caribbean in a variety of reef habitats.
Notes—Polyps feed at night.

Isophyllastrea rigida (Dana, 1848)

Identification—Small hemispherical domes with fleshy ridges and irregular, closed, polygonal valleys each with one or two polyps. Ridges dark with pale valleys.
Distribution—Throughout the Caribbean in a variety of reef habitats.
Notes—Polyps feed at night.

Mycetophyllia lamarckiana Milne Edwadrs & Haime, 1848

Identification—Flat plates with scalloped edges. Ridges outline the plates and extend towards the colonies' centers. Green, gray or brown, ridges often contrast with the rest of the colony.
Distribution—Throughout the Caribbean, but never very common. Often in shaded areas and on walls.
Notes—Polyps feed at night.



Mycetophyllia aliciae Wells, 1973

Identification—Flat or convex plates with ridges along the boarders. Prominent large raised corallites in the valleys distinguish this species from the previous species. Corallites and ridges are often paler than the valleys. Green, brown, or gray.
Distribution—Throughout the Caribbean, but not common.
Notes—Polyps feed at night.

Meandrina meandrites (Linnaeus, 1758)

Identification—Colonies usually form flattened plates or hemispherical heads. Ridges of distinct widely separated septa with a thin line where the sept fuse. Tan, yellow, or brown.
Distribution—Common throughout the Caribbean in a variety of habitats, often in sandy or rubble habitats.

Agaricia agaricites (Linnaeus, 1758)

Identification—Colonies take a variety of forms from encrusting to thick plates or upright blades. Reticulate ridges are very prominent and form short clearly defined valleys.
Distribution—Throughout the Caribbean.

Agaricia humilis (Verill, 1901)

Identification—Colonies form small circular encrustations. Corallites in pits form a reticulated pattern and do not form long ridges or valleys. Brown or yellow-brown.
Distribution—Throughout the Caribbean.

Agaricia tenuifolia Dana, 1848

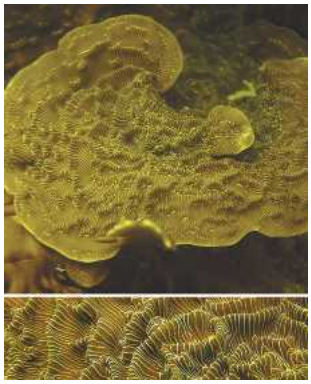
Identification—Colonies form clumps of upright blades with corallites on both sides. Ridges and valleys arranged in wavy, parallel lines. Brown, gray, yellowish or greenish.
Distribution—Common along the Caribbean continental coast. Does not occur in Florida or the Bahamas. Very common in Bocas de Toro on shallow reefs.

Agaricia fragilis Dana 1860

Identification—Colonies form plates or bowls with concentric ridges with long, continuous valleys. Polyps occur only on the top side of the colony. Corallites 1.9-2.5 mm with 17-36 septa. Brown, purplish, tan, or greenish.
Distribution—Throughout the Caribbean and south to Brazil.

Agaricia lamarcki Milne Edwards & Haime 1851

Identification—Thick, one-sided plates that often make spirals or whorls. Long ridges and valleys form concentric ridges. Corallites 3-4.5 mm with 20-30 septa. White star-like polyps. Usually various shades of brown.
Distribution—Common throughout the Caribbean.



Leptoseris cucullata (Ellis & Solander, 1786)

Identification—Colonies form thin plates or saucers with corallite septa running towards the colony margin. Corallites 3-4.6 mm in diameter with 15-25 thin, smooth septa. Ridges slope gently proximally and steeply marginally. Tan, brown or gray.
Distribution—Throughout the Caribbean.

Siderastrea siderea (Ellis & Solander, 1786)

Identification—Colonies grow as domes or rounded heads. Small, round, pitted corallites have 40-50 septa. Usually gray to brown or golden brown.
Distribution—Common throughout the Caribbean on protected shallow reefs or deeper reefs.

Porites porites (Pallas, 1766)

Identification—Thick branched colonies. The stubby branches are covered with corallites on the distal tips and usually form a dead matrix more basally. Embedded corallites are evenly distributed with 12 septa each.
Distribution—Common throughout the Caribbean. Very common in shallow water in Bocas del Toro.

Porites astreoides Lamarck, 1816

Identification—Colonies form mounds, or encrusting colonies. The small corallites (1.2-1.4 cm) are evenly distributed and have 12 septa.
Distribution—Common throughout the Caribbean and extends south to Brazil.

Antipathes caribbeana Opresko, 1996

Identification—Branching occurs to all sides and is almost dichotomous. Branches often curve downward. Living colonies are brownish in color with translucent tentacles and can reach 2 m in height.
Distribution—Vertical wall faces on reef edges in areas of strong currents, 30-100 m depth. Colombia to the Bahamas.
Notes – This species has been commercially important.

Antipathes gracilis Gray, 1860

Identification—Colonies are profusely branched like a net or fan in a single plane. Living polyps are red or orange. Spines are less than 0.1 mm.
Distribution—Deep reefs at 20-100 m in Gulf of Mexico, Caribbean and Colombia.
Notes—This species is difficult to distinguish from *A. atlantica* Gray except on the basis of the color of the living polyps. This species has been commercially important.

Stichopathes lutkeni Brook, 1889

Identification—Colonies consist of a single long, unbranched, coiled stalk, up to 80 cm in length. Colonies are reddish brown with translucent white tentacles. Polyps occur in a single close-packed series.
Distribution—This species is found at depths greater than 20 m throughout the Caribbean.

Plumapathes pennacea (Pallas, 1766)

Identification—Branches extend from the holdfast. Pinnate branchlets occur on both sides of the secondary branches and the simple pinnules are arranged in two rows. Living colonies grayish or orange-brown.
Distribution—This species occurs from Brazil north to the Bahamas.
Notes—This species is commercially important.

Carijoa riisei (Duchassaing & Michelotti, 1860)

Identification—Colonies are bushy clusters of branched, red stalks covered with large white polyps. Stalks have 8 grooves and the polyps are paired or in groups of three. Stalks are often overgrown with other organisms.
Distribution—Throughout the Caribbean, Bahamas and Southern Florida.
Notes—Often common on docks and other man-made substrates.

Briareum asbestinum (Pallas, 1766)

Identification—Colonies of erect fingers extend from a common encrusting, stolonal mat. Coenenchyme usually pink or purplish with large brownish or greenish polyps. Apertures are open.
Distribution—Throughout the Caribbean.

Briareum polyanthes Duchassaing & Michelotti, 1860

Identification—Colonies are encrusting and form soft, meatball-like lobes. Coenenchyme usually purplish, tan, or gray. The apertures are open.
Distribution—Caribbean.
Notes—Usually encrusting gorgonian corals.

Erythropodium caribaeorum **(Duchassaing & Michelotti, 1860)**
Identification—Colonies are encrusting mats of polyps that appear as a smooth tan carpet when the polyps are retracted. Polyps are pale and have fine tan tentacles.
Distribution—Inhabit a variety of reef environments throughout the Caribbean.

Plexaura flexuosa **(Lamouroux, 1821)**
Identification—Colonies broad, and branch in a single plane with dense dichotomous branches. Branches are rigid and there is a small rim around the pinhole aperture when polyps are retracted. Tan, brown, or purplish.
Distribution—Throughout the Caribbean on patch reefs.

Plexaura kükenthali **Moser, 1921**
Identification—Bushy colonies are lavender to pale gray with prominent lateral branching. Calyces present as an slightly raised, inconspicuous lip around the pore. The branches are brittle.
Distribution—Caribbean.

Plexaura kuna **Lasker et al., 1996**
Identification—Slimy branches short and profusely ramified. Calyces never raised or rough to touch and lower calycular lip absent. Apertures round or oval, sometimes gaping with slightly raised rims on terminal branches.
Distribution—Caribbean.

Pseudoplexaura sp.

Identification—Retracted polyps leave round pores without raised rims. Colonies characterized by dichotomous branching. Pale beige to yellow.
Distribution—Caribbean.

Eunicea (Eunicea) mammosa Lamouroux, 1816

Identification—Colonies branch in a single plane from the base with thick branches. Swollen tubular calyces not longer than branch diameter. Calyces with a slightly upturned lower lip. Light yellowish brown.
Distribution—Common in the Northwest Caribbean and uncommon throughout the rest of the Caribbean.

Eunicea (Eunicea) succinea (Pallas, 1766)

Identification—Branching is candelabral, three-dimensional with thin branches. Calyces hemispherical with upturned lower lip. Colonies medium to light brown.
Distribution—Caribbean, Southern Florida and the Bahamas.

Eunicea (Eunicea) laxispica

Identification—Branches thin with usually single branches rising from the base. Elongate, tubular or conical calyces longer than the branch diameter. Lower lip alone may be slightly upturned, but never with a conspicuous sharp upper lip.
Distribution—Caribbean.

Eunicea (Euniceopsis) fusca Duchassaing & Michelotti, 1860

Identification—Colonies usually small and rather bushy with thin terminal branches. The low round bulging calyces are small and irregular in appearance and have a round central aperture.

Distribution—Throughout the Caribbean, Southern Florida and the Bahamas.

Eunicea (Euniceopsis) laciniata Duchassaing & Michelotti, 1860

Identification—The cylindrical branches are the thickest branches in the genus and ends are bulbous. Apertures with eight surrounding lobules and larger projecting lower lip tip. Colonies are medium brown.

Distribution—Caribbean.

Eunicea (Euniceopsis) tourneforti Milne Edwards & Haime, 1857

Identification—Colonies branch in a single plane and branches have elliptical cross-section. Diameter of branch-ends same or smaller than branch. Calyces with conspicuous upturned lower lip that is not hemispherical. Apertures may be gaping. Colonies dark brown.

Distribution—Caribbean.

Eunicea (Euniceopsis) asperula Milne Edwards & Haime, 1857

Identification—Colonies bushy with thick ascending branches, never broad or flattened. Calyces with upturned lower lip usually giving a coarse texture. Surface of the colony is black.

Distribution—Caribbean.

Eunicea (Euniceopsis) knighti Bayer, 1961

Identification—Branches are flexible and slimy. Unlike other *Eunicea* species which have prominent extended calyces, *E. knighti* has pores with raised edges. Bulb or knob at some or all of the branch tips, and sometimes on the branches or branch axils. Colonies are reddish brown and the tentacles are darker than polyp body.
Distribution—Caribbean.

Eunicea (Euniceopsis) calyculata (Ellis & Solander, 1786)

Identification—Tall Colonies of thick ascending branches. Apertures with ridges on the inner lip may appear sealed or gaping. Calyces flat or mound-like. Color variable from light to dark.
Distribution—Caribbean.

Eunicea (Euniceopsis) pallida Garcia-Parrado & Alcolado, 1997

Identification—Bushy colonies are small, with few ramifications. Branches are brittle. Colonies nearly white. Apertures clearly observable.
Distribution—Caribbean.

Muriceopsis flavida (Lamarck, 1815)

Identification—Colonies tall with thin branches. Branching uniformly pinnate and pinnules are short and pinnate. Calyces at most slightly raised with a weak shelf-like calycular lip.
Distribution—Found throughout the reef. Caribbean.

Muriceopsis bayeri **Sanchez, 2001**
Identification—Small (<20 cm) yellow colonies are bushy with robust branches. Calyces at most slightly raised with a weak shelf-like calycular lip.
Distribution—Caribbean of Costa Rica, Panama, and Colombia only.

Plexaurella dichotoma **(Esper, 1791)**
Identification—Colonies with moderate, dichotomous branching with short robust branches. Calyces usually form hemispherical mounds with slit-like apertures. Polyps short when extended. Colonies are pale beige to yellow.
Distribution—Caribbean.

Plexaurella nutans **(Duchassaing & Michelotti, 1860)**
Identification—Sparse dichotomous branching with long thick branches. Apertures slit-like and calyces form hemispherical mounds. Pale beige to yellow.
Distribution—Caribbean.

Muricea muricata **(Pallas, 1766)**
Identification—Colonies candelabral. Branches robust, conspicuously flattened axils, elliptical in cross section and tightly compacted. Branchlets short, and branches are thick to the tip. Calyces prominent, rough, and spiny. Colonies yellowish, orange or amber.
Distribution—Caribbean.

Muricea atlantica Kükenthal, 1919

Identification—Robust branches, elliptical in cross section with large sclerites visible on the surface. Calyces prominent, rough and spiny. Branching is open. Colonies white to gray.
Distribution—Caribbean.

Muricea laxa Verrill, 1864

Identification—Branches thin and delicate and cylindrical in cross section. Hard, rough, prominent calyces with spike on the lower lip. Usually yellow-green, white or orange.
Distribution—Caribbean.

Muricea elongata Lamouroux, 1821

Identification—Colonies bushy and elongate branches are robust, flattened, and elliptical in cross section. Calyces prominent, rough and spiny; color usually yellow-green, white or orange, more yellow/golden than *M. laxa*.
Distribution—Caribbean.

Muricea pinnata Bayer, 1961

Identification—Colonies pinnate or plumose. Calyces prominent, rough, and spiny:. Branches not slimy. Lower calycular lip always present at least as a weak shelf and apertures are round or oval.
Distribution—Caribbean. Uncommon.

Pseudopterogorgia acerosa (Pallas, 1766)

Identification—Colonies with multiple stems and large colonies similar in form to *P. americana* but they are not slimy and are coarse when touched. Flat branches in single plane that remain separated when dry. Polyps regularly placed in rows along the branch edge.
Distribution—Caribbean.

Pseudopterogorgia americana (Gmelin, 1791)

Identification—Branches extremely slimy and full of mucus when alive. Colonies tall with long, regularly branching pinnules and the branchlets mat together when the colonies dry.
Distribution—Caribbean.

Gorgonia flabellum Linnaeus, 1758

Identification—Colonies with robust branches and tightly anastomosing mesh. Branches flattened at an opposite angle to the fan's surface. Yellow, purple or gray.
Distribution—Throughout the Caribbean, Southern Florida and the Bahamas.

Gorgonia mariae Bayer, 1961

Identification—Colonies grow as small yellowish or bluish fans. Branches are pinnate and branch in a single plane. Secondary branches often, but don't always, reticulate.
Distribution—Occasional throughout the Caribbean, but not Florida.

Pterogorgia citrina (Esper, 1792)

Identification—Small (<20 cm) colonies bushy with branching in multiple directions; polyps arise from individual calyces, not a common groove. Blades are narrow. Cross-section of branches flat, from base to tip.
Distribution—Caribbean.

Pterogorgia anceps Pallas, 1766

Identification—Colonies bushy cross section of branches with 3 or 4 flaps which appear triangular or boxed (X or Y-shaped) in cross-section. Branch tips are long, thin, and flattened. Polyps are white.
Distribution—Caribbean.

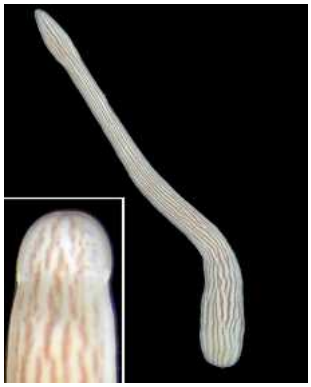
Ctenocella (Ellisella) schmitti (Bayer, 1961)

Identification—Branches are lateral and dichotomous. Colonies are red with white polyps.
Distribution—Occurs throughout the Caribbean and southern Florida. Deep reef habitats especially on walls.

Ctenocella (Ellisella) sp. cf. *barbadensis*

Identification—Colonies are a single, long stalk. Colonies are orange or red with white polyps.
Distribution—Throughout the Caribbean and the Bahamas in deep reefs.

PHYLUM NEMERTEA

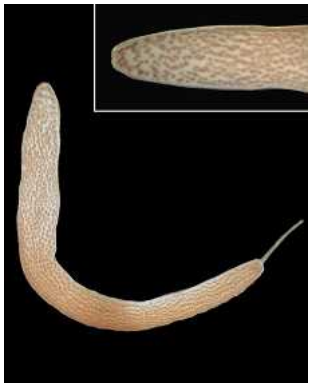


***Baseodiscus delineatus* (Delle Chiaje, 1825)**
Identification—Heteronemertean with creamy to white background and broken red lines. Up to 30 cm long.
Distribution—Europe, Caribbean, Pacific North America, Southern Florida; cryptic in cracks and crevices, and under rocks.

***Baseodiscus* sp.**
Identification—Robust, brown heteronemertean up to 50 cm long.
Distribution—Caribbean; cryptic and found among *Porites sp.* and within larger sponges.

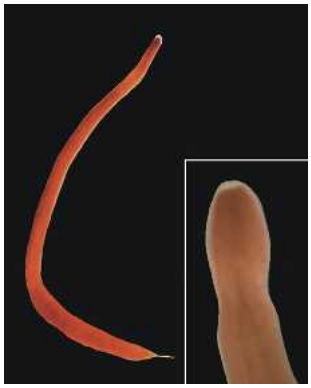
***Micrura chlorapardalis* Schwartz & Norenburg, 2005**
Identification—Green to yellow mottled heteronemertean with blunted posterior and a caudal cirrus. Up to 2 cm long.
Distribution—Belize and Panama, cryptic within coral rubble or its epibiota.

***Micrura ignea* Schwartz & Norenburg, 2005**
Identification—Fiery orange-red heteronemertean with blunted posterior and caudal cirrus. Up to 2.5 cm long.
Distribution—Belize and Panama; within sponge and tunicate encrusted mangrove roots and filamentous algal mats.



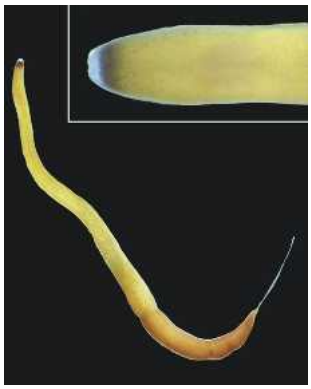
Micrura rubramaculosa Schwartz & Norenburg, 2005

Identification—Red mottled heteronemertean with blunted posterior and a caudal cirrus. Up to 2 cm long.
Distribution—Belize and Panama, cryptic within coral rubble or its epibiota.
Notes—This heteronemertean has a modified direct-developing larva.



Micrura sp. 1

Identification—Cherry-red heteronemertean with white-capped anterior and a caudal cirrus. Up to 4 cm long.
Distribution—Belize and Panama, cryptic within coral rubble or its epibiota.
Notes—This heteronemertean has a direct-developing larva.

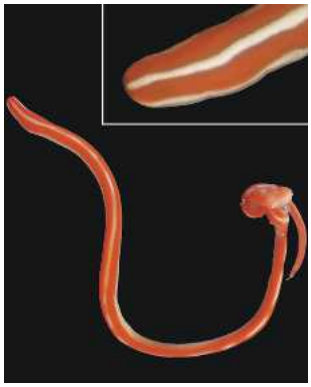


Micrura sp. 2

Identification—Olive to green to yellow-green heteronemertean, occasionally with a faint brown lattice pattern on the dorsal surface. Up to 4 cm long.
Distribution—Belize and Panama, cryptic within coral rubble or its epibiota.

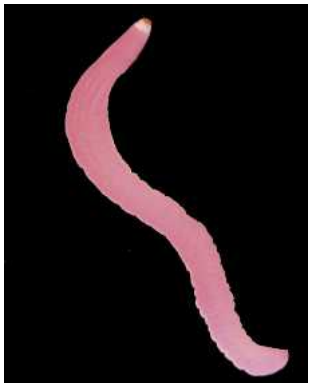
Micrura sp. 3

Identification—Heteronemertean with yellow dorsal and white to light-yellow ventral surfaces; anterior with white tip and posterior with caudal cirrus. Up to 2 cm long.
Distribution—Belize and Panama, cryptic within coral rubble or its epibiota.



Micrura sp. 4

Identification—Bright orange heteronemertean with white stripe down the dorsum, with a caudal cirrus. Up to 3 cm long.
Distribution—Belize and Panama, cryptic within coral rubble or its epibiota.



Micrura sp. 5

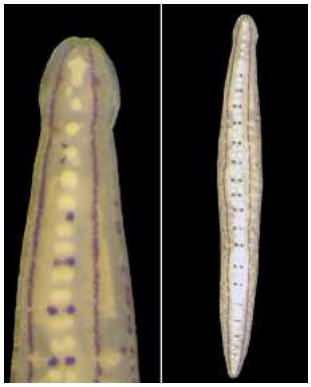
Identification—Pink worm with white and orange tipped head and a caudal cirrus. Up to 2 cm long.
Distribution—Belize and Panama, cryptic within coral rubble or its epibiota.

Notospermus sp.

Identification—Larger brown heteronemertean with distinctive white "V" marking on cephalic lobe and complete white longitudinal banding. Up to 10 cm long.
Distribution—Belize and Panama, cryptic within coral rubble or its epibiota.

Monostilifera sp.

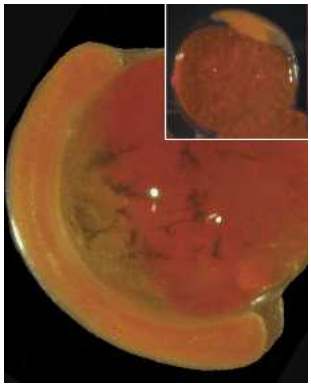
Identification—Hard to miss colorful yet threadlike hoplonemertean; black to deep purple with orange and yellow solid lines and blue iridescent dashed line down the center of the dorsum, and four irregular rows of tiny red eyes. Up to 30 cm long.
Distribution—Panama and Puerto Rico, cryptic within coral rubble or its epibiota.



Tetrastemma herthae (Correa, 1963)

Identification—Creamy to white monostiliferan hoplonemertean with paired purple-red dots along the median of the dorsal surface enclosed by lines and more mottling. Up to 2 cm long.

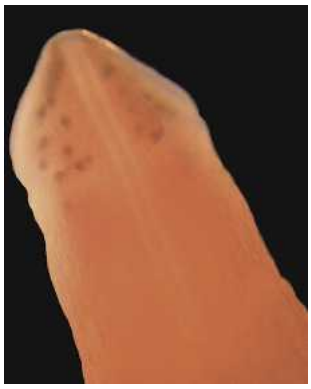
Distribution—Panama and Brazil; cryptic in coral rubble or its epibiota.



Carcinonemertes spp.

Identification—Orange to pinkish monostiliferan hoplonemerteans with exceedingly short proboscis, stylet immediately behind brain, usually with pair eyes, juveniles may have two pairs. Inset shows recently settled juvenile encapsulated and already feeding on crab egg. Adults 5–20 mm long.

Distribution—Panama and worldwide; adults on crab egg-mass, often in parchment-like tubes in gill chambers and among pleopods; juveniles usually on developing crab eggs.



Cratenemertidae spp.

Identification—Yellowish-orange to brownish monostiliferan hoplonemerteans, stout-bodied, with dorsal mid-cephalic ridge, four irregular rows of well-developed dark eyes, sometimes with poorly developed secondary furrows associated with the cephalic cerebral organ furrows; often capable of eel-like swimming when irritated. Up to 10 cm long.

Distribution—Panama and worldwide; cryptic in coral rubble or its epibiota.

Reptantia spp.

Identification—Yellowish-orange polystiliferan hoplonemerteans, stout-bodied, with dorsal mid-cephalic ridge, four rows of well-developed dark eyes, and well-developed secondary furrows associated with the cephalic cerebral organ furrows; often capable of eel-like swimming when irritated. Up to 6 cm long.

Distribution—Panama and worldwide; cryptic in coral rubble or its epibiota.

PHYLUM SIPUNCULA

Golfingia elongata (Keferstein, 1862)

Identification—Smooth and slender body, up to 30 mm long, with short introvert and up to 36 digitiform tentacles. 8-10 rows of hooks on introvert.
Distribution—Widespread in Atlantic and Pacific from arctic to tropical waters; uncommon; intertidal to 590 m in rock crevices (also reported from mangrove root mats and mud).
Notes—The geographic range, range of climatic zones and variety of habitats may suggest that this is actually a species complex. Population genetic studies are desirable but may be difficult due to low abundance of individuals. Scale = 5 mm.

Phascolion (Isomya) gerardi Rice, 1993

Identification—With retracted introvert, specimens are almost spherical. Trunk up to 30 mm long, covered with abundant and prominent papillae. Introvert up to 3X as long as trunk. Distal end of introvert forms bulbous expansion, bearing scattered hooks and 9-24 tentacles.
Distribution—Bahamas, Belize, Mexico; subtidal in crevices of coral rubble; uncommon.
Notes—One of the few *Phascolion* species that does not inhabit shells of gastropods, scaphopods or foraminiferans (Photo by Mary E. Rice). Scale = 5 mm.

Themiste alutacea (Grübe & Oersted, 1858)

Identification—The genus is characterized by branched tentacles. The species is distinguished from congeners by dark scattered hooks on the introvert and pigment spots on the tentacles. Trunk length up to 25 mm, but usually smaller.
Distribution—Warm and temperate waters in the Western Atlantic and Caribbean; intertidal to 30 m; locally abundant in crevices of soft rock, coral rubble or oyster beds.
Notes—Scale = 5 mm.

Aspidosiphon elegans (Chamisso & Eysenhardt, 1821)

Identification—The genus is characterized by the presence of a dorsal anal shield which is round and notably dark in this species, without grooves. Body wall musculature not in bands. Posterior end sometimes forms buds.
Distribution—Tropical Western Pacific and Indian Oceans, Hawaii, Western Atlantic and Caribbean; shallow water; burrowing in coral rubble or soft rock; common.
Notes—The only sipunculan with documented asexual reproduction (Photo by Mary E. Rice). Scale = 2 mm.

Aspidosiphon (Paraspidosiphon) fischeri ten Broeke, 1925

Identification—In this subgenus the longitudinal body wall musculature is organized in bands. In *A. fischeri* the bands are rather indistinct and anastomosing. It has a round anal shield with indistinct borders. Trunk up to 16 mm long.
Distribution—Widespread in the Caribbean and tropical Eastern Pacific; subtidal in coral rubble (also reported from mangrove root mats); very common in Bocas del Toro.
Notes—Although the species of this subgenus in Bocas del Toro are relatively easily distinguished, it may in some cases be necessary to study hook morphology by compound light microscopy. Scale = 5 mm.

Aspidosiphon (Paraspidosiphon) laevis de Quatrefages, 1865

Identification—Relatively large (often 4-5 cm) with up to 35 distinct longitudinal muscle bands that are usually easily visible through the body wall. Solid anal shield with 10-15 longitudinal grooves. Usually with a strongly developed pagoda-shaped, grooved caudal shield. Shape of body quite variable depending on state of contraction.
Distribution—Pantropical in shallow-water; burrowing in coral rubble (but also reported from mangrove root mats in Belize); fairly common.
Notes—Scale = 10 mm.

Aspidosiphon (Paraspidosiphon) parvulus Gerould, 1913

Identification—Anal shield with indistinct edges, surrounded by large, spine-like papillae. Trunk length up to 20 mm.
Distribution—Western Atlantic and Caribbean; subtidal; burrowing in coral rubble (but also reported from mangrove root mats in Belize); very common in Bocas del Toro.
Notes—Scale = 5 mm.

Aspidosiphon (Paraspidosiphon) steenstrupii (Diesing, 1859)

Identification—Anal and caudal shields distinct; caudal shield with irregular grooves; numerous papillae on anterior and posterior regions of trunk. Longitudinal muscle bands usually visible through body wall. Shape of body quite variable depending on state of contraction. Trunk length up to 40 mm.
Distribution—Western Pacific and Western Indian Ocean; Caribbean and eastern Atlantic; subtidal; burrowing in coral rubble; common.
Notes—Scale = 5 mm.

Lithacrosiphon cristatus (Sluiter, 1902)

Identification—Easily identifiable by cone-shaped anal shield, often overgrown with coralline or other algae. Longitudinal musculature in bands, usually visible through body wall. Trunk length up to about 20 mm.
Distribution—Western Pacific, Caribbean and Western Atlantic; subtidal; burrowing in coral rubble; very common in Bocas del Toro.
Notes—Scale = 5 mm.

Antillesoma antillarum (Grübe & Oersted, 1858)

Identification—Relatively large species (max. reported trunk length 80 mm, but generally 30-40 mm); trunk covered with large, dark papillae, especially around the anterior end; short introvert with up to 200 long, digitiform tentacles usually with purple or green pigment.
Distribution—Cosmopolitan in tropical and subtropical waters; intertidal and shallow subtidal in crevices of coral rubble or soft rock; very common in Bocas del Toro.
Notes—Scale = 10 mm.

Phascolosoma nigrescens (Keferstein, 1865)

Identification—Trunk covered with dark, dome-shaped papillae. Trunk length usually between 20 and 40 mm. Introvert longer than trunk; with dark pigment bands and over 100 rows of hooks on introvert. About 20 short tentacles.
Distribution—Circumtropical; intertidal and shallow subtidal; in crevices of coral rubble or soft rock; very common.
Notes—Although the two *Phascolosoma* species in Bocas are easily distinguished by gross morphology, it is usually necessary to study the morphology of the introvert hooks with light microscopy in order to identify *Phascolosoma* species. Scale = 5 mm.

Phascolosoma perlucens (Baird, 1868)

Identification—Trunk often thin-walled with the longitudinal muscle bands visible through body-wall. Anterior trunk region with conical, reddish, posteriorly directed papillae. Dark pigment bands on introvert. Trunk length usually up to 35 mm, rarely larger.
Distribution—Circumtropical but patchy; burrowing in coral rubble; common in Bocas del Toro.
Notes—Scale = 10 mm.

PHYLUM MOLLUSCA, ORDER OPISTHOBRANCHIA

Atys macandrewi E. A. Smith, 1872

Identification—Shell external, translucent, fragile, elongate, with a series of spiral striations more visible near anterior and posterior ends. Body elongate, with a short cephalic shield posteriorly divided and two short parapodia covering anterior end of shell. Color variable, whitish with black pigment of cephalic shield and parapodia, viscera brownish. Up to 8 mm long.
Distribution—Widespread in the tropical Atlantic, from Azores to Cape Verde on the eastern cost and from the southern Caribbean to Brazil on the western cost; intertidal to 50 m depth; uncommon.
Notes—Locally abundant in Bocas del Toro underneath mangrove roots.

Haminoea antillarum (d'Orbigny, 1841)

Identification—Shell external, translucent, fragile, oval, smooth, with no visible sculpture. Body elongate, with a short cephalic shield and two short parapodia covering anterior end of shell. Color variable, dark brown with black and white spots all over body, viscera brownish. Up to 20 mm long.
Distribution—Western Atlantic, from Florida to northern Brazil; intertidal; very common.

Bursatella leachii de Blainville, 1817

Identification—Shell absent, body oval to elongate, inflated. Dorsum covered by numerous long and ramified papillae. Parapodia completely fused together. Color pale brown with numerous black spots and blotches; some specimens with distinctive pale bright blue patches.
Distribution—Circumptropical, in the western Atlantic from Florida to Brazil; locally abundant with seasonal population explosions.
Notes—Several subspecies have been described for different geographic areas, but there no data on possible genetic divergences between populations.

Oxynoe antillarum Mörch, 1863

Identification—Body very elongate, with a long posterior end of foot resembling a tail. Shell external, fragile, covered by parapodia in living animals. Parapodia covered by conical papillae. Rhinophores long. Color variable, generally greenish with brown, purple, and black spots. "Tail" and rhinophores often covered by brownish bands. Bright blue spots are often present near edge of parapodia. Up to 20 mm long.
Distribution—Widespread in the western Atlantic from Bermuda to southern Brazil; common; intertidal to 10 m depth.
Notes—Feeds on *Caulerpa*. This species displays a violent defensive behaviors including secretion of a dense whitish substance and autotomization of the "tail."

Elysia crispata Mörch, 1863

Identification—Body elongate, up to 150 mm long, with extremely convoluted parapodia resembling a lettuce. Rhinophores wide and short. Color very variable, from greenish white to bright blue; some specimens have patches of bright yellow, green or blue on parapodia. Laterals of body generally green with large, oval yellow spots.
Distribution—Western Atlantic, from Florida to the southern Caribbean; very common; intertidal to 15 m depth.
Notes—The most common opisthobranch in Bocas del Toro and the Caribbean region. It was recently transferred to the genus *Elysia*, after *Tridachia* was found to be paraphyletic.

Elysia flava A. E. Verrill, 1901

Identification—Body elongate, with narrow parapodia bearing a series of small papillae. Rhinophores short. Color yellowish, with opaque white spots and upper edge of parapodia with an opaque white line. Viscera dark brown visible through skin. Size up to 20 mm.
Distribution—Amphiatlantic, Mediterranean, Bermuda and southern Caribbean; uncommon; intertidal.
Notes—Recently recorded from the Mediterranean, it was considered an endemic to the tropical western Atlantic.

Elysia cf. *papillosa* A. E. Verrill, 1901

Identification—Body elongate, wide, completely covered with conical papillae. Parapodia tightly pressed against each other leaving only two open spaces. Rhinophores elongate. Color dark green, lighter spots; rhinophores brownish. Size up to 30 mm.
Distribution—Western Atlantic, from Bermuda to the Caribbean; common; subtidal.
Notes—The correct name for this species is still an open question and more anatomical work is needed.

Elysia tuca Marcus & Marcus, 1967

Identification—Body very elongate, with narrow parapodia tightly pressed against each other. Body covered with small papillae. Rhinophores elongate. Color dark green, lighter spots and opaque white bands on head and border of parapodia; rhinophores with brownish apical regions. Size up to 20 mm.
Distribution—Western Atlantic, from Florida and Bahamas to Brazil; very common.
Notes—Feeds on *Halimeda*.

Berthelina quadridens Mörch, 1863

Identification—Body oval, inflated, smooth, with no tubercles or papillae. Rhinophores short, situated on anterior end of body. Color uniform bright red. Viscera visible as a dark patch. Shell internal, not visible. Up to 25 mm long.
Distribution—Western Atlantic; uncommon; intertidal to 50 m depth.
Notes—There are several undistinguishable species using external characters distributed throughout the tropics. At some point all were synonymized with *Berthellina citrina* (Rüppell & Leuckart, 1828). A revisionary work in the progress and evidence indicates that the western Atlantic populations constitute a distinct species.

Pleurobranchus evelinae Thompson, 1977

Identification—Body oval, flattened. Dorsum covered with small, irregular tubercles tightly packed together. Color reddish brown with some white spots. Rhinophores short, situated on a notch of anterior end of body. Up to 20 mm long.
Distribution—Western Atlantic, from the Caribbean to Brazil; subtidal; uncommon.
Notes—This species could be a synonym of *Pleurobranchus atlanticus* Abbott, 1949, but lacks conical dorsal papillae.

Hexabranchus morsomus Marcus & Marcus, 1962

Identification—Body oval, large, up to 100 mm long. Color reddish, with a series of irregular whitish and yellowish parches on dorsum. Mantle margin normally curled up over dorsum covering bright bluish-white areas. Gill composed of several multipinnate leaves.
Distribution—Endemic to the Caribbean, locally common; intertidal to 35 m depth.
Notes—Color blends in with substrate; defensive behavior consists of suddenly unfolding the mantle margin displaying brightly colored areas, followed by swimming away by vigorous contractions of body and mantle margin.

Cadlina rumia Er. Marcus, 1955

Identification—Body oval, flattened, covered by numerous small tubercles. Color translucent white, with a few yellow spots (mantle glands). Rhinophores and gill yellowish brown. Viscera visible through skin. Size up to 15 mm.
Distribution—Western Atlantic, from Florida to Brazil; very uncommon.
Notes—The only species of *Cadlina* from the tropical western Atlantic.

Chromodoris kempfi Ev. Marcus, 1971

Identification—Body elongate, narrow. Color bright bluish with a thick yellow line around mantle margin, a series of large black and white spots and a central white line. Rhinophores and brachial leaves blue with black rachises. Size up to 20 mm.
Distribution—Western Atlantic, from Florida to Brazil; uncommon, subtidal to 40 m depth.
Notes—This species could belong to the genus *Mexichromis*. Additional anatomical work is necessary to determine its valid taxonomic placement.

Aphelodoris antillensis Bergh, 1878

Identification—Body oval to elongate, color translucent clear, covered with opaque white and dark brown spots. The viscera shows through in the central region as a pale orange or pinkish area. Around the mantle edge there are dark brown lines arranged at right angles to the edge. In some specimens there is a yellow border. They are yellowish, white-tipped, with a few spots of brown, and are able to retract into a raised sheath. The five thickened gills are also yellowish, becoming white at the tips.
Distribution—Endemic to the Caribbean. Very common.
Notes—This is one of the most common Caribbean dorids.

Paradoris mulciber Ev. Marcus, 1971

Identification—Body oval, elevated, with a series of large, conical tubercles. Gill composed of several large multipinnate leaves. Color dark brown with some black spots. Apices of branchial leaves orange. Size up to 50 mm long.
Distribution—Western Atlantic from the southern Caribbean to Brazil; this is the first record from Panama; uncommon; subtidal to 20 m depth.
Notes—This is the only species of *Paradoris* from the western Atlantic.

Dendrodoris krebsii (Mörch, 1863)

Identification—Body oval to elongate, lacking tubercles. Mantle margin with radial striations. Color extremely variable, from whitish with brown and black spots to black with lighter patches. Greenish and grayish forms are common; juveniles and some adults red. Rinophores and gill generally same color as rest of body.
Distribution—Western Atlantic, from Georgia to southern Brazil; very common; intertidal to 25 m depth.
Notes—Eastern Pacific records belong to a different species.

Doto cf. *caramella* Er. Marcus, 1959

Identification—Body elongate and narrow, up to 8 mm long. Rhinophoral sheaths elevated, with an irregular edge. Complex cerata arranged on a single row on body sides, composed of large, rounded tubercles. Oral tentacles short; rhinophores long, smooth. Color dark orange with numerous opaque white spots.
Distribution—Western Atlantic, from the southern Caribbean to Brazil.
Notes—Anatomical studies are necessary to confirm the identity of this species. The genus *Doto* is in need of urgent taxonomic work.

Lomanotus vermiformis Eliot, 1908

Identification—Body very elongate and narrow, up to 40 mm long. Rhinophoral sheaths elevated, with a series of papillae on upper edge. Numerous cerata arranged on a single row on body sides. Oral tentacles elongate. Color dark brown with numerous opaque white flecks or broken lines all over body. Cerata translucent, almost transparent, with opaque white spots.
Distribution—Circumtropical, in the western Atlantic only known from Florida; this is the first record from the Caribbean coast of Panama; uncommon; subtidal.
Notes—Very cryptic on its hydroid prey.

Dondice occidentalis Engel, 1925

Identification—Body very elongate, with numerous long cerata arranged in a series of arches. Rhinophores, oral tentacles, and foot corners very elongate. Rhinophores with a several rings on apical half. Color very variable, generally brownish with a central bluish white band running from head to posterior end of body. Some specimens have white pigment on rhinophores and cerata and yellow on head as well as additional blue bands. Size up to 30 mm.
Distribution—Western Atlantic, from North Carolina to southern Brazil; common; intertidal to 30 m depth.
Notes—Feeds on a variety of cnidarians. In Bocas del Toro is common on up-side-down jellyfish (*Cassiopaea*), upon which they feed and lay egg-masses.

PHYLUM ECHINODERMATA

Nemaster rubiginosus (Pourtalés, 1869)

Identification—The 20-40 equal-lengthed arms are 10-37 cm long. Each pinnule perpendicular to previous one. Usually orange with black markings. Can be distinguished from *N. discoideus* on the basis of size and color. The taxonomy of *Nemaster* is unstable.
Distribution—Throughout the Gulf of Mexico, and Caribbean on low-energy reef crests and margins.
Notes—Hides in crevices during the day and feeds, perched on the reef, at night.

Oreaster reticulatus (Linnaeus, 1758)

Identification—Robust, yellow, brown or orange, up to 50 cm in diameter. Aboral surface with thick reticulated plates and large pointed tubercles. Oral surface is smooth. Juveniles are mottled green or brown.
Distribution—North Carolina through the Caribbean to Brazil, as well as Cape Verde and western Africa. Common in *Thalassia* beds and mangrove channels in Bocas del Toro.
Notes—Commonly harvested for commercial souvenirs.

Eucidaris tribuloides (Lamarck, 1816)

Identification—Thick, cylindrical spines that are often covered with epibionts. Test is brown to red with brown spines. Up to 13 cm in diameter, including spines.
Distribution—North Carolina through Brazil in crevices in reefs and back-reef lagoons.
Notes—This species is an omnivorous grazer and spawns on the full moon.

Diadema antillarum (Philippi, 1845)

Identification—Extremely long, thin, fragile black, white, or blue-black spines. Diameter including spines up to 40 cm.
Distribution—Gulf of Mexico, Caribbean south to Brazil and into the eastern Atlantic. Common on coral reefs to a depth of 50 m, but most common in shallow water.
Notes—Nocturnal grazers. A massive die-off of this species occurred in the Caribbean in 1983. Recovery has been patchy.

Lytechinus variegatus (Lamarck, 1816)

Identification—Short, usually green spines, with a greenish test and large white pedicellariae. Up to 11 cm, including spines. Animals often hold leaves, shells and other debris over the top of the test.
Distribution—North Carolina south to Brazil and throughout the Caribbean. Common in *Thalassia* beds and around mangrove roots.
Notes—Spawns on new and full moon.

Lytechinus williamsi Chester, 1968

Identification—Small, up to 5 cm. White or green spines, white or red pedicellariae. Could be confused with juvenile *L. veriegatus*.
Distribution—Florida keys, Panama, Belize. Especially common in *Porites* in Bocas del Toro.
Notes—Little is know of the ecology of this species.

Tripneustes ventricosus (Lamarck, 1816)

Identification—White spines with brown test, tube feet, and pedicellariae. Up to 15 cm in diameter.
Distribution—Throughout the Caribbean. Common in shallow habitats in Bocas del Toro.
Notes—This species is a generalist herbivore and development includes a feeding larval stage.

Echinometra lucunter (Linnaeus, 1758)

Identification—Oval test with long, sharp, tapering spines. Blackish or reddish spines. Dark milled rings at the base of the spines. Usually less than 15 cm.
Distribution—North Carolina, throughout the Caribbean to Brazil. Shallow reef rock, and reef crests.
Notes—Excavates into reef rock. Uncommon in Bocas del Toro, but can be found near Hospital Point.

Echinometra viridis Agassiz, 1863

Identification—Similar to *E. lucunter* but with white milled rings at base of the spines. Spines brownish fading to green towards the tips.
Distribution—Florida, West Indies, Panama, Venezuela. Usually on reefs.
Notes—Very common in Bocas del Toro.

Clypeaster rosaceus (Linnaeus, 1758)

Identification—Large, up to 20 cm, robust, elongate sea biscuit. Brown in life, covered uniformly with dark spines. White tests of dead animals are common.
Distribution—Florida, Gulf of Mexico and Caribbean. Common in Bocas in *Thalassia* beds and sandy areas.
Notes—Does not burrow but often covers the dorsal surface with debris. Development includes a lecithotrophic larva.

Clypeaster subdepressus (Gray, 1825)

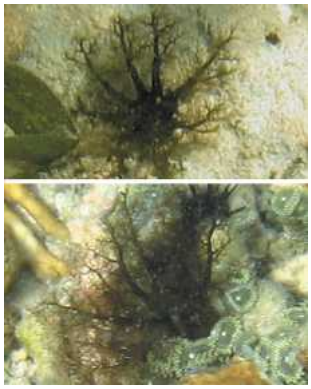
Identification—Large, flattened sea biscuit with central hump on dorsal side. Up to 30 cm long. Uniformly covered with small, pale brown spines.
Distribution—Throughout the Caribbean, south to Brazil. Sandy areas of fine shell hash, usually lightly covered with sediment.
Notes—Development included planktotrophic larvae.

Meoma ventricosa (Lamarck, 1816)

Identification—Inflated, oval heart urchin, uniformly covered with short, red-brown spines.
Distribution—Throughout the Gulf of Mexico and Caribbean. Coarse sand and shell hash. To 200 m.
Notes—Animals live below the sand, but trails and mounds of sand mark their presence.

Plagiobrissus grandis (Gmelin, 1791)

Identification—Elongate, slightly flattened, heart urchin. The test is fragile. Light brown, covered with short spines with patches of very long spines on the dorsal surface.
Distribution—Throughout the Caribbean, south to Brazil. In sandy areas, to 200 m.
Notes—Lives buried several centimeters below the surface. Raises spines when threatened.



Ocnus suspectus (Ludwig, 1875)

Identification—Small, soft, mottled brownish cucumber with tube feet scatted all over the body. 10 short, thick, highly branched tentacles surround the mouth.
Distribution—Lesser Antilles and Virgin Islands, Florida. Very common in patchy rocks and *Thalassia* in Bocas.
Notes—These animals hide in crevices and under rocks and *Thalassia* rhizomes, with the tentacles protruding. Little is known about the ecology of this species.

Astichopus multifidus (Sluiter, 1910)

Identification—Large, up to 50 cm long, mottled brown and white. Dorsal surface covered with small papillae. Ventral surface uniformly covered with tube feet.
Distribution—Throughout the Caribbean, to a depth of about 30 m. On sandy substrates or seagrass beds.
Notes—This is a fast moving sea cucumber and will eviscerates easily.

Isostichopus badionotus (Selenka, 1867)

Identification—Occasional warts on dorsal surface and numerous larger papillae line the ventrolateral margin. Coloration highly variable. Orange, red, brown, yellowish often with darker spots. Three ventral bands of tube feet.
Distribution—Throughout the Caribbean, north to South Carolina and south to Brazil. To about 60 m. Common in *Thalassia* and on sand in Bocas del Toro.
Notes—May eviscerate or slough epidermis when handled.

Holothuria mexicana Ludwig, 1875

Identification—Transversely wrinkled sea cucumber. Up to 50 cm long. Dorsally brown or gray, with occasional warts. Ventral surface reddish, orange, or pale with uniform covering of tube feet.
Distribution—Throughout the Caribbean, in shallow habitats. Common in Bocas del Toro near mangroves and seagrass.
Notes—Development includes a feeding larva. Sometimes hosts eulimid gastropod parasites in Bocas del Toro.

Astrophyton muricatum Lamarck, 1816

Identification—Finely branched arms can span up to 1 meter and the central disk can be up to 7 cm. Adult color is highly variable but juveniles are pink.
Distribution—Throughout the Caribbean, to 70 meters in reef habitats.
Notes—Nocturnal, climbing onto perches to suspension feed at night. Site fidelity is strong and animals can live for at least 7 years.

Ophiocoma echinata (Lamarck, 1816)

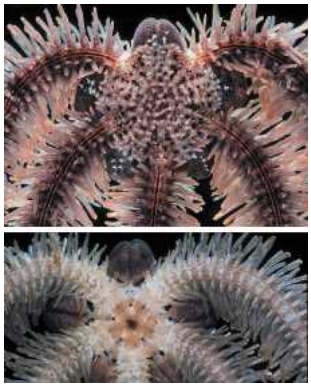
Identification—Robust spiny arms. Black, brown and/or gray with white tube feet and thick-ended dorsal arm spines. Granule-covered central disk.
Distribution—Throughout the Caribbean. Shallow (to 20 meters) seagrass, reefs and mangroves and especially coral rubble.
Notes—Nocturnal, arms extend from hiding places to suspension feed at night. Development includes a feeding larva.

Ophiactis savignyi (Müller and Troschel, 1842)

Identification—Small (2 cm diameter with arms) 6-armed brittle star. Green, brown or cream.
Distribution—Tropical and subtropical eastern Pacific, Indo-Pacific and Atlantic. Common in all reef habitats.
Notes—Can be extraordinarily abundant, often lives in sponges. Reproduction includes asexual fission and sexual development with a feeing larva.

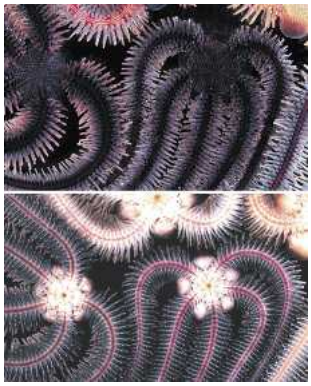
Ophiothrix suensonii Lütken, 1856

Identification—Dark dorsal stripe along each arm. Long slender arm spines. Color highly variable from gray, pink, orange, yellow, red, or almost black.
Distribution—Throughout the Caribbean, on reefs and mangroves.
Notes—Extraordinarily abundant in Bocas del Toro, more so that other locations in the Caribbean, where it almost coats many sponges.



Ophiothrix cimar Hendler sp. nov.

Identification—Very short, tapering disk spines and rough, blunt, compressed arm spines. It can be pinkish, grayish, reddish or yellowish brown; the dorsal surface of the arm bears a dark medial stripe flanked by pale stripes, and dark bands every several joints; the ventral surface of the arm is mottled. It resembles *Ophiothrix lineata* Lyman, which lives on sponges, but *O. cimar* generally occurs under coral rubble.
Distribution—Costa Rica to Panama. Intertidal to 10 meters, under coral rubble in back-reefs.



Ophiothrix stri Hendler sp. nov.

Identification—Many, tiny round stumps on the disk and blunt, rounded arm spines; the smallest dorsal spines are nearly ovoid. It is usually purple to reddish brown, but some are individuals are ochre or yellow. The dorsal side of its arm has a dark medial stripe between pale stripes, and banding, which are most apparent in pale colored individuals; the ventral side of the arm has a conspicuous medial stripe.
Distribution—Costa Rica to Panama. Intertidal to 10 meters, under coral rubble algae and sponge.
Notes—Similar to *Ophiothrix synoecina* Schoppe in body form but not in color pattern. Both species often live within rock tunnels bored by the echinoid *Echinometra lucunter* (Linnaeus).

PHYLUM UROCHORDATA

Ascidia curvata (Traustedt, 1882)

Identification—Individuals are 4.5 cm, solitary or in groups, with colorless and translucent tunic, and many oral tentacles. The intestine is uniform along its extension with no dilatation.
Distribution—Found only on mangrove roots in calm waters in Bocas del Toro. The geographical range also includes the Caribbean, Bermudas and northeastern and southern Brazil.
Notes—Usually found hanging up side down from mangrove roots.

Ascidia interrupta Heller, 1878

Identification—Individuals are 7 cm, with a brown or dark green body wall and greenish or green and yellow siphons. The intestine is quite expanded forming a bag. Musculature forms a dense mat on the right side of the body.
Distribution—Found only on mangrove roots in calm waters in Bocas del Toro. The geographical range also includes the Caribbean and northeast Brazil.
Notes—May be found in large aggregations. Siphons are always directed upwards.

Ascidia sydneiensis Stimpson, 1855

Identification—Individuals are 5 cm long. There is a great dilatation in the intestine. The musculature forms a border of short and parallel fibers all around the dorsal, ventral and posterior margins of the right side of the body.
Distribution—Found in mangroves in Bocas del Toro. Widely distributed in all oceans.
Notes—It is probably an introduced species in Bocas del Toro and one of the two samples was on a pipe (man-made structure).

Ascidia sp. 1

Identification—Individuals are 8 cm long. The most striking features are the black siphons with a row of up to 16 vertical white lines around their internal margin. The musculature forms an entangled network of fine fibers on the right side of the body and the posterior part of the intestine is expanded.
Distribution—Found both on mangrove roots and buried in coral debris on the sea floor in Bocas del Toro.
Notes—This is a new species that will be described elsewhere.

Ascidia sp. 2

Identification—Individuals are up to 13 cm long, half of it representing the elongate oral siphon. The tunic is yellow or orange, very delicate and encrusted with calcareous fragments. There is no sign of a dorsal tubercle aperture.
Distribution—Found buried in coral debris on the sea floor in Bocas del Toro.
Notes—The body wall is very delicate and difficult to be extract from the substrate.

Ascidia sp. 3

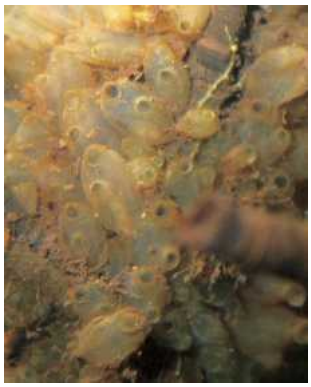
Identification—Individuals are up to 6 cm long, with red body wall and siphons. Oral siphons have numerous, very thin, oral tentacles (60-85). The dorsal and ventral margins of the right side of the body are bordered with short and parallel muscle fibers. The posterior part of the intestine is expanded.
Distribution—Found only on mangrove roots in Bocas del Toro.
Notes—This is a new species that will be described elsewhere.

Phallusia nigra Savigny, 1816

Identification—Individuals are around 7 cm long with apical siphons. The tunic is black, thick and smooth without epibionts. Both pharynx and body wall are very dark or black and many accumulation vesicles surround the gut.
Distribution—Found on mangrove roots and coral skeletons in Bocas del Toro. Elsewhere, it has a wide geographical range in warm seas.
Notes—It is very common in all habitats and it is usually surrounded by ophiurans**.**

Ecteinascidia turbinata Herdman, 1880

Identification—The zooids in the colony are clavate and united at their bases. The pharynx has 19 rows of stigmata on each side of the body and the testis consists of rod-like follicles surrounding the ovary.
Distribution—Found at 10 m or more in depth on coral reefs in Bocas del Toro, the geographical range includes the Caribbean, Bermuda, Cape Verde Islands, Senegal and the Mediterranean Sea.
Notes—In other localities, individuals may be larger and bright orange.



Ecteinascidia styeloides (Traustedt, 1882)

Identification—This is a colonial ascidian formed by 8 mm long zooids, usually densely packed. Both siphons are tubular and long for the size of the zooid. Short and parallel muscle fibers form a border on the dorsal region of both sides of the body. The pharynx has 9-15 rows of stigmata on each side.
Distribution—Found on mangrove roots in Bocas del Toro, its geographical range includes Guadeloupe and Belize.

Rhodosoma turcicum (Savigny, 1816)

Identification—The only individual found was 2.5 cm long. Siphons are close together, covered by a cleft that forms a lid in the anterior region. The tunic is cartilaginous and firm with conical points on the lid and on the margin of the cleft.
Distribution—Found on mangrove roots in Bocas del Toro, the geographic range includes shallow waters of the Caribbean, Mediterranean, Red Sea, Indian Ocean and the Pacific.

Rhopalaea abdominalis (Sluiter, 1898)

Identification—Dark violet with a smooth tunic, individuals have round siphons that are close together and do not protrude from the body surface. The body is long with the gut beneath the pharynx.
Distribution—Found on coral debris on the sea floor in Bocas del Toro, the geographic range includes the Gulf of Mexico, Belize, Guadeloupe, Venezuela and northeastern Brazil.
Notes—It is easily mistaken with *Phallusia nigra* but it is not black and is usually smaller.

Clavelina sp.

Identification—The colony is like a bouquet of clavate and yellow zooids, up to 4 cm thick. Body muscles extend between the endostyle and the thorax base. The pharynx has 18 rows of stigmata with around 45 stigmata on each side of the body.
Distribution—Found only on coral reefs at greater than 10 m depth in Bocas del Toro.
Notes—This is a new species that will be described elsewhere.

Cystodytes dellechiajei (Della Valle, 1877)

Identification—The colony is deep purple, 0.5-1.0 cm thick (or more). The zooids are enclosed in a capsule of shield shaped calcareous spicules, visible as round systems throughout the tunic. Siphons are usually long.
Distribution—Found only on coral reefs in Bocas del Toro, the geographic range includes the Caribbean, Bermudas and most of the warm waters of the world.
Notes—In other localities colonies may be brown or honey colored.

Eudistoma clarum (Van Name, 1902)

Identification—The small colony is white, translucent, smooth and without encrustations. The colony is rounded or oval, attached to the substrate along most of the under surface.
Distribution—Found only on coral reefs, underside of stones or on coral debris in Bocas del Toro, the geographic range includes Belize, Guadeloupe and the Bermudas.
Notes—Colonies must be anesthetized for dissection to avoid zooid contraction.

Eudistoma olivaceum (Van Name, 1902)

Identification—Yellowish colonies are formed of numerous small circular heads, whose peduncles unite into a basal mass that attaches the colony to the substrate. Each zooid has two dark dots, one on the nervous ganglion and one on the anterior end of the endostyle.
Distribution—Found only on mangrove roots in Bocas del Toro, its geographic range includes many Caribbean islands, Bermudas, one record in the Pacific Ocean and one in Senegal.

Eudistoma sp.

Identification—Colonies are mushroom-shaped and are very conspicuous because of the bright orange or pink color. Usually 3-5 heads arise from the same base.
Distribution—Found only on coral reefs in Bocas del Toro, usually on lateral or overhanging surfaces.
Notes—This is a new species that will be described elsewhere.

Polyclinum sp.

Identification—The only colony found was half pink and half dark green with a smooth surface and conspicuous cloacal cavities. Zooids are 5 mm and the one larva found was 0.5 mm long. The pharynx has 13-14 rows of stigmata. The sac–like posterior abdomen is long and contains gonads.
Distribution—Found only on mangrove roots in Bocas del Toro.
Notes—This is a new species that will be described elsewhere.

Distaplia corolla Monniot, 1974

Identification—Bright orange or brick colored colonies are very small (8-12 mm diameter). Each has a central cloaca. The zooids are 4 mm long and have a broad trifurcated dorsal languet. The larva is 1.8 mm long.
Distribution—Found only on the undersurface of one unattached rock in Bocas del Toro, the geographic range includes Guadeloupe and the Azores.
Notes—In Guadeloupe colonies are rose colored, either faint or bright.

Diplosoma listerianum (Milne-Edwards, 1841)

Identification—The encrusting colony is very thin, covering large areas of the substrate. The colony is grayish because the zooids have a dark abdomen, visible through the very delicate tunic. Larvae bud precociously and have 2 zooids.
Distribution—Found both on mangrove roots and dead coral in Bocas del Toro. Widely distributed in all oceans.
Notes—It is probably an introduced species in the area.

Trididemnum orbiculatum (Van Name, 1902)

Identification—The encrusting colony has white circles (calcareous spicules) around each dark zooid. The general color may be grayish or brown. The zooid is 1 mm and the larva 0.6 mm long.
Distribution—Found only on mangrove roots in Bocas del Toro, the geographic range includes Belize, Curaçao, Guadeloupe, Bermuda and Brazil.
Notes—The color of the colony depends on the quantity of calcareous spicules on the surface.

Polycarpa cartilaginea (Sluiter, 1898)

Identification—The individual collected was about 2 cm long. The gut forms a closed loop with one endocarp inside. Gonads are characteristically ovoid, attached to the body wall by a short ligament and enclosed in a transparent sheath with numerous vesicles.
Distribution—Found on the sea floor in a *Thallasia* bed formed by coral debris in Bocas del Toro. The geographic range includes Belize, Curaçao and Guadeloupe.
Notes—Only one individual was found.

Polycarpa insulsa (Sluiter, 1898)

Identification—Individuals (3-5 cm long) have a tough, wrinkled, brown or grayish tunic and have many longitudinal vessels inside the pharynx. The gut forms a closed loop with many endocarps within it. The gonads are completely buried in the tissue of the body wall.
Distribution—Found both on mangrove roots and on dead coral in Bocas del Toro, the geographic range includes Venezuela, Colombia, and Guyanas.

Polycarpa spongiabilis (Traustedt, 1883)

Identification—Individuals are 7-8 cm long, usually brown. The gut forms a closed loop with 2-3 endocarps inside. Many gonads on both sides of the body are somewhat buried in the tissue of the body wall.
Distribution—Found only on coral reefs in Bocas del Toro, the geographic range includes Florida, Bermuda, many Caribbean Islands, Guyanas and Brazil.
Notes—The large size and very open apical siphons help to identify the species in the field.

Styela canopus Savigny, 1816

Identification—Individuals (2-4 cm long) often form crowded groups. The tunic is brownish and wrinkled and siphons are usually striped. There are many endocarps internally on the body wall and two long gonads on each side with ramified testis follicles.
Distribution—Found both on mangrove roots and on coral reefs in Bocas del Toro. The geographic range includes Florida, Bermuda, many Caribbean islands, Brazil, Atlantic coast of Africa and Europe.

Herdmania pallida (Heller, 1878)

Identification—Individuals (4-5 cm long) are usually covered by encrustations and may be recognized by the iridescent bluish lining of the siphons. The tunic is soft and the body wall has many calcareous needle-like spicules.
Distribution—Found only on mangrove roots in Bocas del Toro, the geographic range includes many Caribbean islands and Brazil.
Notes—This species was identified as *Herdmania momus* in earlier literature.

Microcosmus exasperatus Heller, 1878

Identification—Individuals (4-6 cm long) are usually encrusted except on their siphons, which are conspicuous. The leathery tunic is orange or brown. There is one gonad in each side of the body, divided into three portions. The pharynx has 8-9 folds in each side.
Distribution—Found both on mangrove roots and on coral reefs in Bocas del Toro. It is widely distributed in all oceans.
Notes—Long siphons are a diagnostic character in the field.

Pyura vannamei Monniot, 1994

Identification—Individuals (4.0-5.5 cm long) have a leathery and wrinkled purple tunic. Siphons have four small lobes. The pharynx has six folds in each side. The hind intestine is swollen. The gonads are very long and on the right side is close to the endostyle.
Distribution—Found on coral reefs in Bocas del Toro, the geographic range includes the Pacific coast of Costa Rica and Guadeloupe.
Notes—This species was identified as *Pyura lignosa* in earlier literature.

Pyura vittata (Stimpson, 1852)

Identification—Individuals (3-6 cm long) have a leathery and brown tunic, sometimes with a peduncle. Siphons have four distinguished lobes forming a cross-like aperture. The pharynx has six folds in each side. Gonads are long and the one on the right side is U-shaped.
Distribution—Found both on mangrove roots and on coral reefs in Bocas del Toro. The geographic range includes many Caribbean islands and Brazil.

Pyura sp. 1

Identification—The only individual found was small (2 cm wide), almost round, with a wrinkled red tunic and yellow lines on the siphons. The tunic has sheet-like projections for attachment. The pharynx, with 31 oral tentacles, is red in fresh specimens. The right gonad is close to the endostyle and C-shaped.
Distribution—Found on mangrove roots in Bocas del Toro.

Pyura sp. 2

Identification—Individuals (3-5 cm long) have black or reddish, leathery and wrinkled tunics, with bright red siphons. Algae may encrust the individual. There are 20 oral tentacles, non-ramified but with a toothed margin.
Distribution—Found on mangrove roots in Bocas del Toro.
Notes—The non-ramified oral tentacles are unique in the family.

Pyura sp. 3

Identification—The only individual found was large (9 cm long), with a leathery, wrinkled and wine-colored tunic. There are six large folds on each side of the pharynx and the oral tentacles are little ramified. Gonads are divided into incompletely separate parts.
Distribution—Found on mangrove roots in Bocas del Toro.
Notes—The size of the animal and the position of the short red siphons are diagnostic characters in the field.

Molgula occidentalis Traustedt, 1883

Identification—Individuals (1 cm long) are round and covered by sand. The gonad encircles a renal sac on the right side of the body. The left side gonad is in U-shaped and included within the intestinal loop.
Distribution—Found inside decaying mangrove roots or on a vertical bank of roots and sediments in Bocas del Toro, the geographic range includes the Atlantic coast of the United States south of North Carolina and many Caribbean islands.