

New Gastropods from Texas, the Western Caribbean, and Southern Brazil

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ABSTRACT For inclusion within a new reference text on marine molluscan biogeography, four new gastropods are described here in anticipation of the publication of the book. These include: *Stramonita alderi* n. sp. (Muricidae) from the Texan Subprovince, Carolinian Province; *Turritella (Torcula) howardpetersi* n. sp. (Turritellidae) and *Prunum sunderlandorum* n. sp. (Marginellidae) from the Nicaraguan Subprovince, Caribbean Province; and *Charonia marylenae* n. sp. (Charoniidae) from the Janeiran Subprovince, Paulinian Province.

KEY WORDS Muricidae, Turritellidae, Marginellidae, Charoniidae, Carolinian Province, Caribbean Province, Paulinian Province

INTRODUCTION

The authors are now in the process of finishing a new reference text on tropical marine molluscan biogeography, slated for publication later this year. While completing the manuscript, four interesting and biogeographically-important new species were brought to our attention by five advanced molluscan field collectors; including Marcus and Jose Coltro (Femorale.com, Italy), Kevan and Linda Sunderland (Florida), and Darwin Alder (Texas). These interesting discoveries from the Western Atlantic Region included a new Triton's Trumpet in the genus *Charonia* from Brazil, a new muricid in the genus *Stramonita* from the coastal lagoons of Texas, a new turritellid in the subgenus *Torcula* from the San Blas Islands of Panama, and a new marginellid in the genus *Prunum* from coastal Honduras. We are incorporating these new biogeographically-important taxa into our new book and they will be illustrated along with 1764 other worldwide tropical mollusks. As no new species will be described in the new book, this paper is the sole

vehicle for the formal taxonomic descriptions and systematics of these gastropods.

The holotypes of three of the new species are deposited in the Los Angeles County Museum of Natural History, Los Angeles, California and bear LACM catalog numbers and one holotype is deposited in the Zoological Museum of the University of São Paulo, São Paulo, Brazil and bears an MZSP catalog number. These new taxa are described in the following sections, which are arranged by biogeographical province and subprovince.

NEW SPECIES FROM THE TEXAN SUBPROVINCE, CAROLINIAN PROVINCE

The Texan Subprovince is one of five subprovinces of the Carolinian Molluscan Province, which ranges from Cape Hatteras, North Carolina, through the Florida Keys, and includes the entire Gulf of Mexico to Isla Mujeres off the Yucatan Peninsula. The Texan Subprovince extends from the Mississippi

River mouth south to Veracruz, Mexico and includes the entire coastline of Texas (Petuch, 2013: at pp. 16, 65-69).

SYSTEMATICS

Class	Gastropoda
Subclass	Orthogastropoda
Superorder	Caenogastropoda
Order	Sorbeoconcha
Infraorder	Neogastropoda
Superfamily	Muricoidea
Family	Muricidae
Subfamily	Rapaninae
Genus	<i>Stramonita</i> Schumacher, 1817

Stramonita alderi Petuch and Berschauer,
new species
(Figure 1A, B)

Description. Shell subfusiform, biconic, with inflated body whorl and high, elevated spire; shoulder sharply-angled, bordered by 10 evenly-spaced, large rounded knobs; subsutural area of shoulder and spire whorls sloping, slightly concave; body whorl heavily sculpted with 24 large raised spiral cords, with 2 largest cords encircling shoulder and around mid-body and bearing 10 proportionally very large rounded knobs; spiral cords intersected by 10 widely-spaced, low, rounded longitudinal varices, with intersections producing small, rounded knobs on larger spiral cords; aperture proportionally very large and flaring; inner edge of labrum with 16 thin, elongated teeth (on holotype); shell base color bright yellow-orange, overlaid with variable amounts of dark blackish-brown longitudinal flammules, primarily on the varices, producing a zebra-type pattern; large rounded knobs at intersections of varices and spiral cords often colored bright orange; early whorls dark chocolate brown; columellar area and entire aperture pale orange, becoming pale yellow-orange along edge of labrum.

Type Material. HOLOTYPE - Length 33.8 mm, width 21.6 mm, Mustang Island, Corpus Christi, Nueces County, Texas, LACM 3800.

Type Locality. Found dead on an oyster-covered rock at low tide, carried by a hermit crab, Mustang Island Jetty at the mouth of Fish Pass, Mustang Island, Corpus Christi, Nueces County, Texas.

Distribution. Known only from jetties and rock outcrops along the coastal lagoons and estuaries of Texas. Tunnell *et al.* (2010: at p. 212) states that *S. alderi* prefers “hard substrates; usually rocks or jetties exposed to the ocean at depths of 0-4 m.”

Etymology. Named for Darwin Alder of Houston, Texas, who collected the holotype.

Discussion. This small but distinctive muricid has previously been referred to as “*Stramonita* cf. *rustica* (Lamarck, 1822)” by Tunnell *et al.* (2010: at p. 212) in their book *Encyclopedia of Texas Seashells*. Their photographs were the only known color illustrations of this elusive mollusk and little is known about its range and relative abundance along the Texas coastal lagoon systems. The inclusion of this *Stramonita* species within the Texas malacofauna is also of interest, as *S. rustica* had previously only been known from Florida, the Caribbean Sea, and Brazil (Clench, 1947: at p. 82; Abbott, 1974: at p. 180) and was not considered, classically, to be part of the Texan coastal fauna (a typical specimen of *Stramonita rustica* is shown here on Figure 1E, F for comparison). True *S. rustica* consistently has a pure white aperture, which contrasts greatly with the pale orange aperture seen in *S. alderi* (Figure 1B). The new Texas species also has a much more colorful and ornate shell, being ornamented with stronger and more prominent spiral cords and in having prominent bright

yellow-orange bands containing darker orange knobs. The shell ornamentation of *S. rustica* is much more reduced and less-developed, consisting of low thread-like cords and small, rounded knobs, and it is a much drabber shell, being colored in shades of brown and gray and lacking the bright orange bands and knobs of *S. alderi*. The new Texas species also has finer and more numerous teeth within the aperture than does *S. rustica*, numbering 16 on the holotype as opposed to 8-10 on typical *S. rustica* specimens.

The new Texas muricid is actually morphologically closest to the southeastern Florida endemic, *S. buchecki* Petuch, 2013 (Figure 1C, D), which also has a distinctive orange aperture. This small, previously overlooked, species inhabits coastal lagoons and tidal creeks all along southeastern Florida, from Martin County south to Broward County, and is found in the same type of oyster bed environments that are preferred by *S. alderi*. The Florida endemic differs from its Texan congener in having a less-sloping shoulder and spire whorls, in having a more strongly-stepped and scalariform spire that is ornamented with larger knobs, in having large patches of blue and olive-green on the body whorls, and in lacking the prominent orange bands and knobs. *Stramonita buchecki* also differs from *S. alderi* in having fewer and proportionally larger apertural teeth, averaging only 7-8 on most specimens. Both the Texan *S. alderi* and the Floridian *S. buchecki* occur together on oyster beds with the larger, and more widespread Carolinian Province *S. floridana* (Conrad, 1837). These two Carolinian Province endemics, along with the widespread *S. rustica* and the St. Helena and Ascension Island endemic *S. bicarinata*, form a species radiation of small rapanines that co-exists with, but is different from, the larger *Stramonita* species such as those typified by *S. haemostoma* (Linnaeus,

1767), *S. floridana*, and *S. brasiliensis* Claremont and Reid, 2011. The *S. rustica* complex may eventually prove to be a separate subgenus all to itself.

NEW SPECIES FROM THE NICARAGUAN SUBPROVINCE, CARIBBEAN PROVINCE

The Nicaraguan Subprovince is one of seven subprovinces of the Caribbean Molluscan Province, which ranges from Bermuda and the Bahamas south to the mouth of the Amazon River, and encompasses all of the island archipelagoes of the Caribbean basin. The Nicaraguan Subprovince extends from Guatemala to the San Blas Islands of Panama, and encompasses all the banks and island chains off the coasts of Honduras and Nicaragua (Petuch, 2013: at p. 20, 97-112).

SYSTEMATICS

Class	Gastropoda
Subclass	Orthogastropoda
Superorder	Caenogastropoda
Order	Sorbeoconcha
Infraorder	Mesogastropoda
Superfamily	Cerithioidea
Family	Turritellidae
Genus	<i>Turritella</i> Lamarck, 1799
Subgenus	<i>Torcula</i> Gray, 1847

Turritella (Torcula) howardpetersi Petuch and
Berschauer, new species
(Figure 2A, B)

Description. Shell small for genus, thin and delicate, elongated and pagodiform, with narrow early whorls widening toward anterior end; suture tightly adherent; whorls ornamented with 2 large, thin spiral cords, one on either side of central depressed sulcus; anterior cord proportionally larger and more prominent than posterior cord, giving shell distinct pagoda or

stupa shape; edges of cords faintly nodulose, being ornamented with very numerous tiny rounded beads; area between cords smooth and silky, sculptured with very numerous, extremely fine spiral threads; last whorl on adult shells wider than previous whorls, with prominent large longitudinal laminae developing within central sulcus; base shell color dark tan or brown, with scattered large areas of darker purple-brown; edges of thin spiral cords marked with tiny brown dots and dashes; protoconch and early whorls uniformly orange-tan; aperture proportionally large, roughly rectangular in shape, flaring; interior of aperture pale tan.

Type Material. HOLOTYPE - Length 37.5 mm, width 10.4 mm, off Porvenir, San Blas Islands, Panama, LACM 3801; OTHER MATERIAL EXAMINED - length 35.3 mm, from the same locality as the holotype, in the research collection of the senior author; length 36.9 mm and 36.7 mm, from the same locality as the holotype, in the research collection of the junior author; length 36 mm, in the collection of Howard Peters, Bath, England, UK.

Type Locality. The type lot was dredged by shrimpers from 35 m depth off El Porvenir, San Blas Islands, Panama.

Distribution. Known only from deeper offshore areas along the San Blas Archipelago of Caribbean Panama.

Etymology. The taxon honors Dr. Howard Peters of Bath, Somerset, England and the University of York, a member of the molluscan assessment group for the IUCN Red List of Threatened Species. His hard work and dedication have provided much-needed protection for numerous critically endangered species of cone shells and abalones from around the world.

Discussion. The subgenus *Torcula* represents a group of endemic American turritellids that characteristically have a sculpture pattern composed of two strong cords on each whorl and a deep central depressed sulcus between the cords. In the western Atlantic, four species of *Torcula* are now known to exist: the wide-ranging *Turritella (Torcula) exoleta* (Linnaeus, 1758) (Figure 2C), which occurs in the Carolinian, Caribbean, and Brazilian Molluscan Provinces; and three species that are restricted to the Nicaraguan Subprovince of the Caribbean Province, *T. (Torcula) marianopsis* Petuch, 1990 (San Blas Islands of Panama), *T. (Torcula) bayeri* Petuch, 2001 (deep reefs off Honduras), and *T. (Torcula) howardpetersi* (San Blas Islands of Panama). Of these, the new San Blas Islands species is morphologically closest to *T. (Torcula) exoleta*, but differs in being a smaller and more delicate shell with a shorter, squatter, and less elongated profile. On *T. (Torcula) exoleta*, the two main cords on each whorl are equal in size and development (seen here on Figure 2C), while those of *T. (Torcula) howardpetersi* are unequal, with the anterior cord being much larger than the posterior one and dominating the shell outline. The new San Blas Islands turritellid lives together with the larger and more elongated *T. (Torcula) marianopsis*, but is a much more abundant species and is more frequently collected. Together, these detritus-eating turritellids form large, extensive beds that literally carpet the sea floor in many deep offshore areas of the San Blas region.

SYSTEMATICS

Class	Gastropoda
Subclass	Orthogastropoda
Superorder	Caenogastropoda
Order	Sorbeoconcha
Infraorder	Neogastropoda
Superfamily	Volutoidea
Family	Marginellidae

Genus *Prunum* Herrmannsen, 1852

Prunum sunderlandorum Petuch and
Berschauer, new species
(Figure 2D, E)

Description. Shell small for genus and species group, averaging only around 12 mm, elongate and oval, almond-shaped, widest across shoulder and tapering toward anterior end; shoulder rounded, blending directly into body whorl; spire whorls low, broadly pyramidal; edge of labrum thickened, rounded, extending posteriorly beyond penultimate whorl; body whorl base color uniform dark slate gray with wide, darker blue-gray band around midbody; broad midbody band darker at both posterior and anterior edges, producing 2 thin darker parallel bands; subsutural area of body whorl bounded by thin band of cream-white; spire whorls dark reddish-brown, with sutures edged in white; early whorls and protoconch dark orange-red; edge of labrum white, marked along dorsal edge with dark yellow-orange stripe; protoconch broad, low, dome-shaped, composed of 2 whorls; aperture proportionally narrow, widening slightly toward anterior end; columella with 4 large, rounded teeth, with anteriormost pair of teeth being closest together; interior of aperture colored dark reddish-brown.

Type Material. HOLOTYPE - Length 12.6 mm, width 7.3 mm, 5 m depth, Trujillo Bay, Trujillo, Honduras, LACM 3802; OTHER MATERIAL EXAMINED - length 11.3 mm and 12.4 mm, from the same locality and depth as the holotype, in the research collection of the senior author; length 11.7 mm and 11.6 mm, from the same locality and depth as the holotype, in the research collection of the junior author; lengths 11.5 mm and 12.2 mm, from the same locality and depth as the holotype, in the Sunderland collection.

Type Locality. In muddy sand, 5 m depth in Trujillo Bay, off Trujillo, Departamento de Colon, Honduras.

Distribution. At present, known only from the Caribbean coast of Honduras, along the area opposite the Bay Islands of Utila, Roatan, and Guanaja.

Etymology. Named for Kevan and Linda Sunderland of Sunrise, Florida, who collected the type lot of the new species in Honduras, and also in recognition of their many important contributions to our knowledge of Caribbean malacology.

Discussion. *Prunum sunderlandorum* is the newest known member of a tightly-knit species complex of gray-colored marginellids that is found along the coastal areas of the western and southern Caribbean. Some of these include the widespread southern Caribbean *Prunum prunum* (Gmelin, 1791), the Honduran and Nicaraguan *P. storeria* (Couthouy, 1837), and the Panamanian *P. leonardhilli* Petuch, 1990. Of these, *P. sunderlandorum* is by far the smallest species, averaging less than half the length of the other three larger taxa. Of the members of this complex, the new species is closest to *Prunum leonardhilli* (Figure 2F), but differs in being a much smaller and more slender shell, in having the widest part of the shell being around the shoulder and not the mid-body like in *P. leonardhilli*, in being a much more darkly-colored shell with a dark slate-gray base color as opposed to pale bluish-gray, and in having the labrum extend farther posteriorly, with the lip of *P. sunderlandorum* extending onto the penultimate whorl and with the lip of *P. leonardhilli* extending only to the shoulder line.

NEW SPECIES FROM THE JANEIRAN SUBPROVINCE, PAULINIAN PROVINCE

The Paulinian Province was originally described as a subprovince of the Brazilian Province (Petuch, 2013: at p. 146, 163-175). Additional research and data has subsequently shown that this area contains a very distinct warm-temperate fauna and is here (and in the new book) considered to represent a full biogeographical province all to itself. The Paulinian Province has been further subdivided into two separate subprovinces; a northern Janeiran Subprovince (Cabo Frio south the Florianopolis) and a southern Uruguayan Subprovince (Florianopolis south to northern Argentina). This Paulinian Province will be described, and much of its fauna illustrated, in the up coming biogeography book.

SYSTEMATICS

Class	Gastropoda
Subclass	Orthogastropoda
Superorder	Caenogastropoda
Order	Sorbeoconcha
Infraorder	Mesogastropoda
Superfamily	Tonnoidea
Family	Charoniidae
Genus	<i>Charonia</i> Gistel, 1847

Charonia marylenae Petuch and Berschauer,
new species
(Figure 3A, B)

Description. Shell of average size for genus, elongated, with inflated body whorl and high, elevated spire; shoulder sharply-angled, with flattened, tabulate subsutural areas; shoulder bounded by large, rounded cord and ornamented with 10-12 large, rounded knobs; spire whorls distinctly stepped and scalariform, with spire length being longer than body whorl length; body whorl ornamented with 32-36 fine, closely-packed rows of fine raised spiral cords;

mid-body ornamented with large knobbed cord that aligns to knobbed shoulder cord, producing a bituberculate appearance; suture bordered by 6 smooth raised cords; siphonal canal short, stubby, ornamented with 12-14 large raised cords; varices widely scattered, usually one per whorl, low, thick, with large knob at posterior end; aperture proportionally large, flaring, oval in shape; columella with large, well developed parietal shield and numerous elongated plicae; posterior end of columella with single large rib-like fold; labrum well developed, flaring, expanded, edged with 16-18 large elongated teeth, some of which bifurcate; shell color variable, ranging from brown to purple-brown to orange or yellow (as in holotype); base color overlaid with variable amounts of brown dashes and dots and small brown flammules; shoulder and mid-body knobs marked with alternating large brown and white spots and patches; cords around suture conspicuously marked with alternating vivid dark brown and white dashes; interior of aperture white; teeth on edge of labrum colored dark brown with intervening white spaces; plicae of parietal shield white with intervening dark brown staining.

Type Material. HOLOTYPE - Length 119.6 mm, width 59.4 mm, 50 m depth off Cabo Frio, Rio de Janeiro State, Brazil (MZSP 150892); OTHER MATERIAL EXAMINED - length 259 mm, from the same locality and depth as the holotype, in the research collection of the senior author; length 210 mm, from the same locality and depth as the holotype, in the collection of Marcus and Jose Coltro, São Paulo, Brazil.

Type Locality. Trawled by fishermen from 50 m depth off Cabo Frio, Rio de Janeiro State, Brazil.

Distribution. At present, known only from an area extending from the Cabo Frio area of

northern Rio de Janeiro State, south to off Rio de Janeiro, Brazil.

Etymology. The new taxon honors Marylena Francisquini Coltro of São Paulo, Brazil and Miami, Florida, an inspired amateur naturalist with a deep fascination for the marine world. She cultivated this passion within her children, Sabrina, Marcus, and Jose Coltro (owners of Femorale.com shell company), which led them to pursue lifetimes of field work and discovery.

Discussion. *Charonia marylenae* is the newest member of a worldwide complex of closely related warm-temperate water triton shells. Besides the new Brazilian taxon, seven other species belong to this complex and these include: *Charonia lampas* (Linnaeus, 1758) (Mediterranean Sea and West Africa); *C. capax* (Finlay, 1927) (New Zealand); *C. pustulata* (Euthyme, 1889) (South Africa); *C. rubicunda* (Perry, 1811) (South and SE Australia); *C. powelli* Cotton, 1957 (South Australia, Tasmania); *C. sauliae* (Reeve, 1844) (Japan, Taiwan); and *C. macilenta* Kuroda and Habe, 1961 (Ryukyu Islands, South China Sea, Vietnam). All of these charoniids are closely related to, and are typified by, the Mediterranean Sea-West African *Charonia lampas* and most have previously been considered subspecies or forms of that wide-ranging Eastern Atlantic triton. We here consider them all to be full species, along with the Brazilian *C. marylenae*. Referred to here as the “*Charonia lampas* Complex”, this group of charoniids forms a separate lineage that diverged away from the typical charoniid species group that defines the family, containing *Charonia tritonis* (Linnaeus, 1758) (widespread Indo-Pacific), *C. variegata* (Lamarck, 1816) (western Atlantic, central Atlantic), and *C. seguenzeae* Aradas and Benoit, 1874 (eastern Mediterranean).

Of the known members of the *Charonia lampas* Complex, *C. marylenae* is morphologically closest to *C. pustulata* from South Africa (Figure 3C). Indeed, past workers (including the senior author; Petuch, 2013: at p. 167) have often referred to the Brazilian shell as “*Charonia lampas pustulata*” and considered it to be simply a biogeographical and genetic outlier of the South African triton. With the availability of more specimens for study, it is now apparent that the Brazilian shell is morphologically and biogeographically distinct and needs a new name. Although superficially similar to *Charonia pustulata*, the new Brazilian shell differs in having a narrower and less inflated body whorl, in having a proportionally higher and narrower spire, in having a much more stepped spire with distinctly tabulate and flattened whorls, and in having fewer and finer cords around the subsutural area. In having a very high, protracted spire, *C. marylenae* somewhat resembles the elongated South Australian *C. powelli*, but differs in having a more stepped spire, in having proportionally much larger knobs on the shoulder and around the mid-body, and in having stronger cords around the body whorl.

The new species has also been referred to the taxon “*Charonia weisbordi* Gibson-Smith, 1976” by some workers and the name is essentially problematic. The true *C. weisbordi* is a rare Pliocene fossil from the Mare Formation of northern Venezuela and it bears only a superficial resemblance to *C. marylenae*. The Venezuelan fossil has only been illustrated by Weisbord (1962; broken fragments) and by Gibson-Smith (1976; an incomplete broken specimen) but they show that the Pliocene species is a smaller and more inflated species, has smaller and less-developed shoulder and mid-body knobs, and has reduced spiral cords on the body whorl. Without doubt, *C. weisbordi* represents the Pliocene ancestor of the living *C.*

marylenae and demonstrates that members of the *Charonia lampas* Complex were already present in South America at least 3.5 million years ago.

The new triton is a component of a species rich cool water fauna, filled with endemic taxa, that has evolved in the Cabo Frio area of northern Rio de Janeiro State, from Arraial do Cabo northward to Farol de São Tome. Here, large and powerful upwellings of cold, nutrient-rich water are brought up to the surface, and these allow dense phytoplankton blooms to form and support cold tolerant scleractinian corals and hydrocorals. Seven species of scleractinian corals and two species of hydrocorals flourish in the Cabo Frio region and form small, scattered patch reefs all along the coast (referred to as the "Coral Oasis"; see Leao, Kikuchi, and Testa, 2003). These cooler-water reefs and coral bioherm areas support numerous endemic gastropods, including the triton *Charonia marylenae*, the cone shells *Lamniconus petestimpsoni* and *L. patriceae*, and the volutes *Odontocymbiola macaensis* and *O. saotomensis*.

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of *Turritella (Torcula) howardpetersi*); and Darwin Alder (for *Stramonita alderi*).

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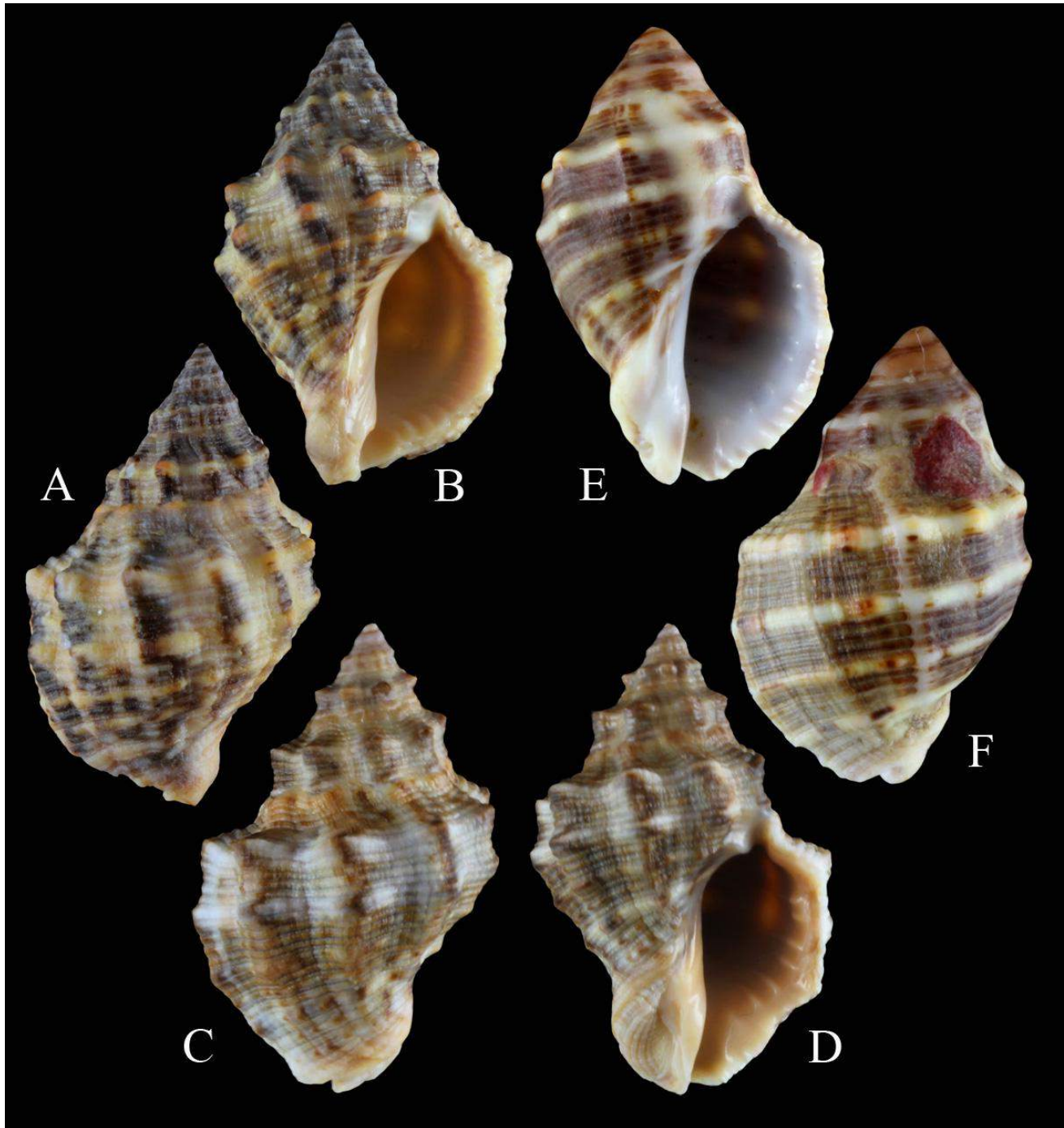


Figure 1. *Stramonita* Species (Muricidae) from the Carolinian and Caribbean Provinces.

A, B= *Stramonita alderi* Petuch and Berschauer n. sp., holotype (LACM 3800), length 33.8 mm, collected dead on Fish Pass Jetty, Mustang Island, Corpus Christi, Nueces County, Texas; C, D= *Stramonita buchecki* Petuch, 2013, length 26.3 mm, Singer Island, Lake Worth Lagoon, Palm Beach County, Florida; E, F= *Stramonita rustica* (Lamarck, 1822), length 25.0 mm, Piñones, Puerto Rico.

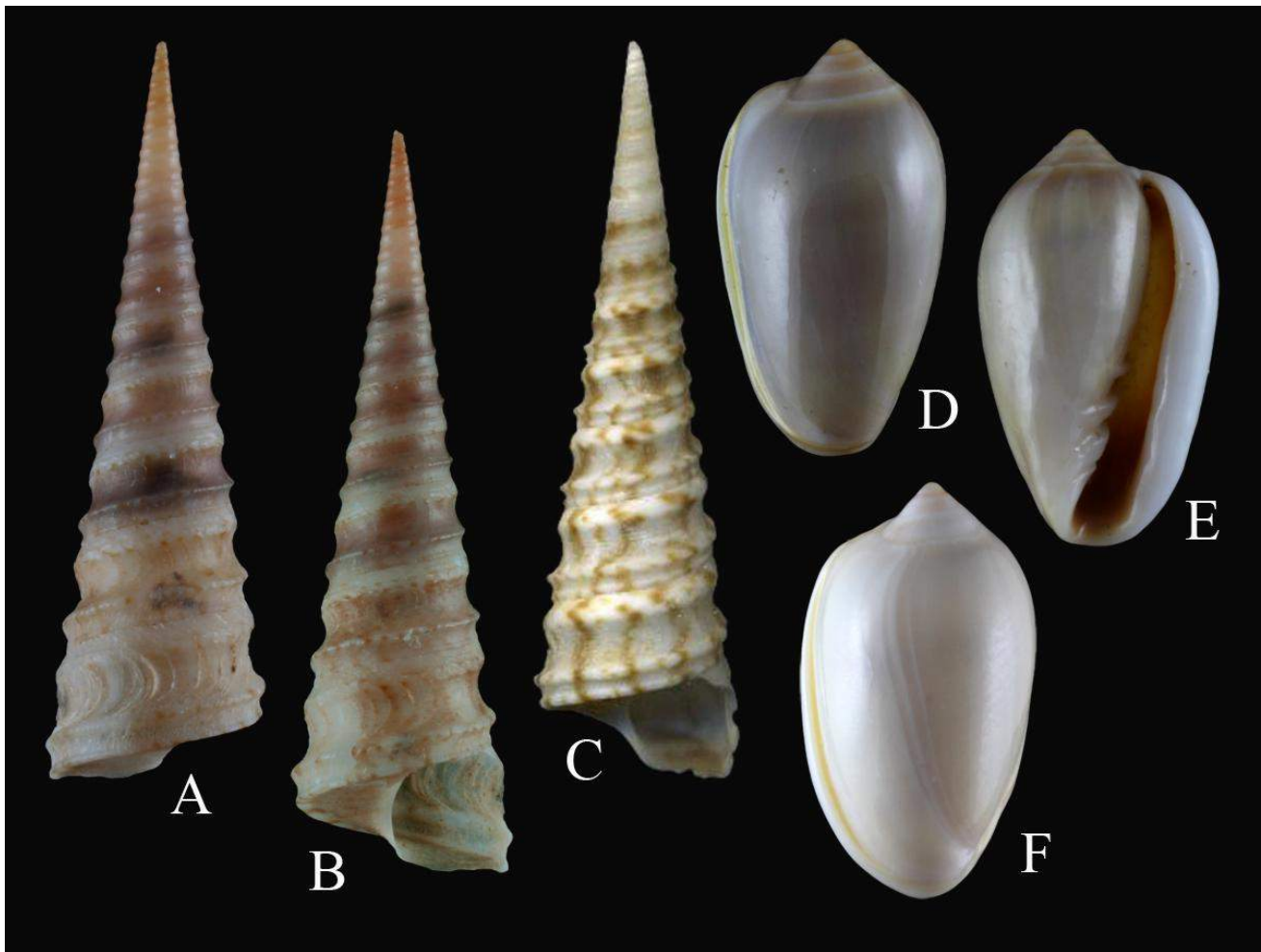


Figure 2. *Turritella (Torcula)* Species (Turritellidae) and *Prunum* Species (Marginellidae) from the Nicaraguan Subprovince, Caribbean Province.

A, B= *Turritella (Torcula) howardpetersi* Petuch and Berschauer, n. sp., holotype LACM 3801), length 37.5 mm, from 35 m depth off El Porvenir, San Blas Islands, Panama; **C=** *Turritella (Torcula) exoleta* (Linnaeus, 1758), length 62 mm, in coral rubble, 10 m depth off Green Turtle Cay, Abaco Islands, Bahamas; **D, E=** *Prunum sunderlandorum* Petuch and Berschauer, n. sp., holotype (LACM 3802), length 12.6 mm, 5 m depth in muddy sand in Trujillo Bay, Trujillo, Honduras; **F=** *Prunum leonardhilli* Petuch, 1990, length 21.0 mm, from 20 m depth off Portobello, Panama. Although the two *Prunum* species differ greatly in size, they are shown here as approximately the same size in order to allow for an easier comparison of their shell characters.

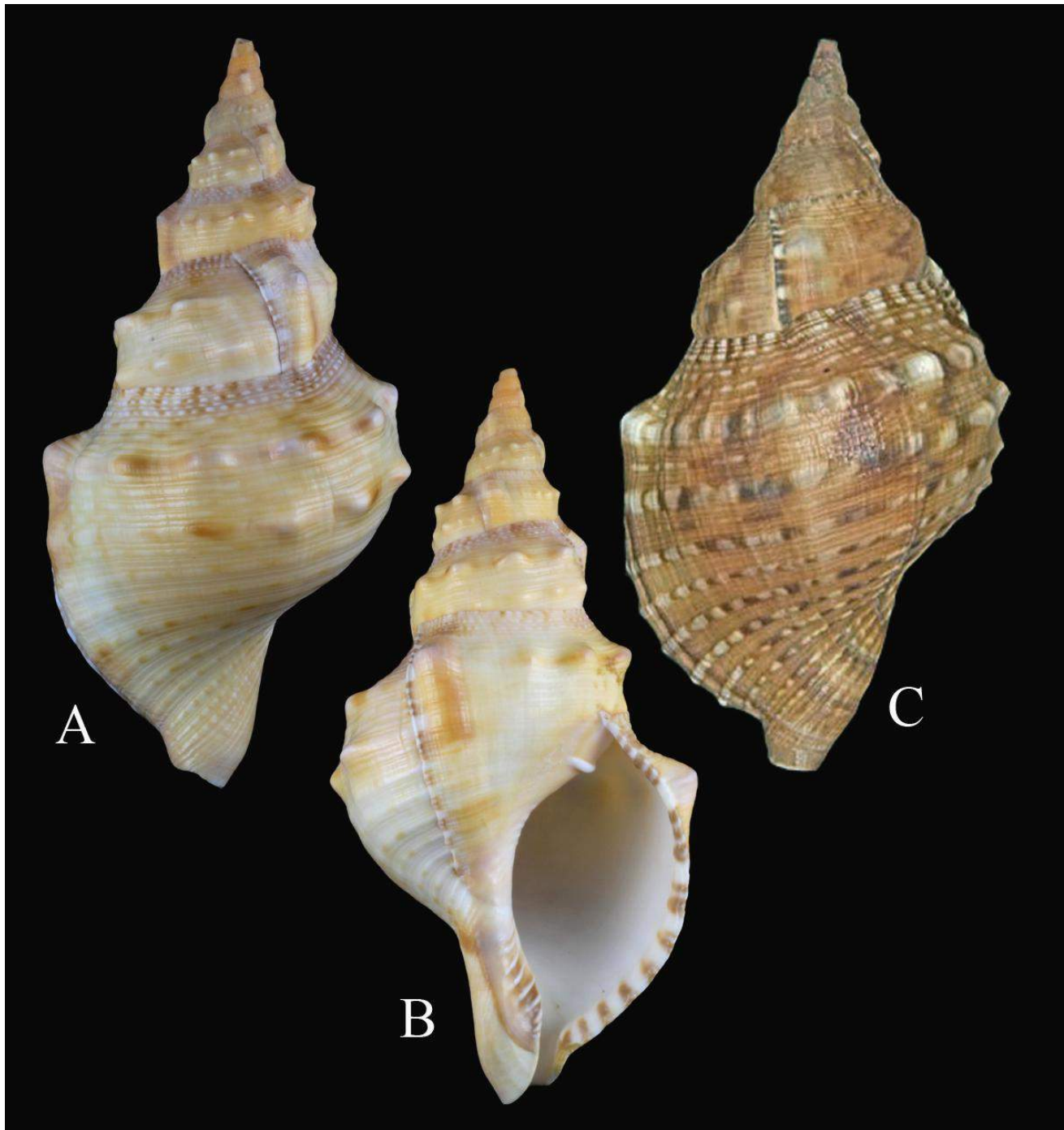


Figure 3. *Charonia* Species (Charoniidae) from Brazil and South Africa.

A, B= *Charonia marylenae* Petuch and Berschauer, n. sp., holotype (MZSP 150892), length 119.6 mm, 50 m depth off Cabo Frio, Rio de Janeiro State, Brazil; **C= *Charonia pustulata*** (Euthyme, 1889), length 185 mm, 10 m depth off Betty's Bay, Cape Province, South Africa.