

A New Deep Water *Fasciolaria* (Fascioliidae: Fascioliinae) Tulip Shell from off the Dry Tortugas, Western Florida Keys, Florida

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ABSTRACT A new species of True Tulip Shell in the genus *Fasciolaria* has been discovered in lobster traps set in deep water off the Dry Tortugas, western Florida Keys. This new Tulip Shell is closest to the widespread Carolinian Province-Caribbean Province *F. tulipa* (Linnaeus, 1758) but differs in having a proportionally shorter siphonal canal, in having a conspicuous striped color pattern and stronger raised cords on the siphonal canal, and by having sharply-angled spire whorls that bear prominent rounded knobs on the first postnuclear whorls. In this aspect, the coronated postnuclear whorls of the new species, here named *F. bittneri*, resemble those seen on the heavily-ornamented Calabrian Pleistocene species, *F. okeechobeensis* Tucker & Wilson, 1932, from the Bermont Formation of southern Florida.

KEY WORDS *Fasciolaria*, *F. bittneri*, Fascioliidae, Dry Tortugas, Florida Keys

INTRODUCTION

The deeper water areas (30-100 m depths) off the Dry Tortugas, western Florida Keys, have long been known to house a rich molluscan fauna with a high level of biodiversity and containing numerous endemic species of considerable scientific interest (Petuch, 1987; Petuch and Myers, 2014; Petuch and Sargent, 2011; Petuch and Berschauer, 2020 at pp. 25-26, 56-57). Some of the recent malacological discoveries from this under-explored area include gastropods such as the muricids *Phyllonotus whymani* Petuch and Sargent, 2011 and *Murexiella kalafuti* Petuch, 1987, the eosiphonid *Manaria burkeae* García, 2008, the colubrariid *Bartschia frumari* García, 2008, the pisaniid *Hesperisternia sulzyckii* Petuch and Myers, 2014, the peristerniine fascioliid *Leucozonia jacarusoi* Petuch, 1987, the scaphelline volute *Scaphella junonia elizabethae* Petuch and Sargent, 2011, the turrid

Strictispira redferni Tippett, 2006, and bivalves such as *Lindapecten lindae* Petuch, 1999.

Ongoing collecting of specimens from lobster traps, set in the lower neritic environments around the Dry Tortugas, has recently yielded numerous specimens of a large species of *Fasciolaria* that was unlike any Tulip Shell ever seen from that area. Besides having conspicuous brown-striped siphonal canals and bright orange early whorls, these Tulip Shells also were unusual in having distinctly angled and coronated early whorls, sculpted with small rounded knobs. Numerous specimens of this remarkable fascioliid were collected by Captain Dale Bittner of Key West, Florida, who immediately recognized them as something completely new to science. He subsequently sent several specimens to the junior author for study and it was determined that these remarkable shells constituted a new species, which is named *Fasciolaria bittneri* new species

in this paper. The holotype of the new species is deposited in the type collection of the Department of Malacology, Natural History Museum of Los Angeles County, Los Angeles, California and bears LACM catalog number 3807.

SYSTEMATICS

Phylum Mollusca

Class Gastropoda

Order Neogastropoda

Superfamily Buccinoidea

Family Fascioliariidae

Subfamily Fascioliariinae

Genus *Fasciolaria* Lamarck, 1799

Fasciolaria bittneri Petuch and Berschauer,
new species

(Plate 1, Figures A-F; Plate 3, Figure A)

Description. Shell of average size for genus, generally between 100 and 120 mm in length, fusiform, heavy and thickened, with elevated spire; shoulder of body whorl rounded, sloping; shoulders of spire whorls distinctly angled and stepped, subcarinate, especially on first 4 postnuclear whorls; first 3 postnuclear whorls ornamented with 10-12 prominent rounded and elongated knobs per whorl, producing distinct undulating appearance on shoulder angles; body whorl smooth and highly polished, ornamented with 4 low, rounded cords along subsutural area; subsutural cords prominent only on body whorl and becoming obsolete on first 4 postnuclear whorls; first 3 postnuclear whorls devoid of subsutural cords; aperture proportionally large, oval, having interior ornamented with very numerous fine, closely-packed cords, colored white to pale orange; columella with 3 large blade-like teeth, with anteriormost being the largest and best-developed; columellar callous and folds orange in color; siphonal canal proportionally short, narrow, ornamented with 12-14 large, prominent, raised, evenly-spaced

coarse spiral cords; base color of body whorl varying from white to deep red-orange to chestnut brown, overlaid with 3 wide bands of large amorphous patches of dark red, brown, or black, one around shoulder and subsutural area, one around mid-body, and one around base of body whorl near siphonal canal juncture; white base color with wide red patches is most frequently-encountered color form; spire whorl color, regardless of body whorl color, always deep orange-red on first 4 whorls; base color of body whorl heavily overlaid with 18-20 dark brown, solid, narrow, evenly-spaced lines, many of which break up into series of dashes and small rectangular checkers on most individuals; areas between subsutural cords of body whorl shoulder and between individual cords of siphonal canal marked with single, very dark brown, prominent band, producing characteristic and conspicuous striped appearance; protoconch smooth, rounded, dome-like, composed of one and one-half whorls, colored bright yellow-orange.

Type Material. HOLOTYPE - length 115.1 mm, width 53.4 mm (LACM 3807); Paratype 1 - length 113.5 mm, width 52.7 mm (LACM 3808); three specimens in the collection of the senior author measuring between 104.0 and 111.0 mm in length (Paratypes 2-4); 12 specimens in the collection of the junior author measuring between 99.5 and 127.2 mm in length (Paratypes 5-16); and 6 specimens in the collection of Dale Bittner measuring between 107.6 and 115.6 mm in length (Paratypes 17-22).

Type Locality. The holotype and paratypes of the new species were collected from baited lobster traps set at an 18-33 meter range of depths north of the Dry Tortugas, western Florida Keys, Monroe County, Florida, at approximately Lat. N24° 53' 38", Long. W80° 17' 2". (Figure 1)

Distribution. Presently known only from 18-33 meter depths off the Dry Tortugas, western Florida Keys, Monroe County, Florida. The new species may also be present within the 20-40 meter depth contour of the edge of the Florida Platform, north of the Dry Tortugas. (Figure 1)

Etymology. Named for Captain Dale Bittner, owner of the charter boat “Bait Stealer”, of Key West, Florida, who collected the type specimens and recognized the species as being new to science.

Discussion. *Fasciolaria bittneri* is variable in color and is found in a brown-black color form (Plate 1, Figures A-B), a red color form (Plate 1, Figures C-D), and an orange-brown color form (Plate 1, Figures E-F). Of all the known living and fossil species, *Fasciolaria bittneri* is morphologically-closest only to the living *F. tulipa* and the Florida fossil *F. okeechobeensis*; with the smooth body whorl and banded color pattern that is seen on most *F. tulipa* and with the distinctly-angled and heavily-coronated early whorls seen on the Bermont fossil *F. okeechobeensis*. The new species differs from *F. tulipa* in having a proportionally shorter and broader siphonal canal that is more heavily-ornamented with prominent large raised cords over the entire length, by having a conspicuous alternating light and dark striped pattern on the entire siphonal canal, in consistently having bright orange early whorls regardless of the main teleoconch color, and in having a wider and better-developed siphonal and parietal callus which is often orange in color, and in having sharply-angled and shouldered early whorls that are ornamented with distinct rounded knobs, producing coronated postnuclear whorls. The early whorls of the Calabrian fossil *F. okeechobeensis* are more elaborately sculpted than those of *F. bittneri*, having proportionally larger knobs and stronger spiral cords and ribs (Petuch, 1994). The new

Florida Keys species may represent a living descendant of the Bermont Formation *F. okeechobeensis* that has managed to survive in the deeper water areas, where the marine climate was more stable during the extreme cold and low sea levels of the late Tertiary Age of the Late Pleistocene and the Greenlandian Stage of the early Holocene.

As presently understood, the genus *Fasciolaria* (*sensu stricto*) is represented by six described living species and nine described fossil species. The living taxa include: *Fasciolaria tulipa* (Linnaeus, 1758), which is widespread throughout the Carolinian Province, the Greater Antilles, and the northern half of the Caribbean Province (also known as a latest Pleistocene fossil from the late Tertiary Age Coffee Mill Hammock Member of the Fort Thompson Formation of southern Florida; shown here on Plate 2, Figures A-D; Plate 3, Figure B); *Fasciolaria petuchi* Crabos and Quieroz, 2023, which is restricted to the coast of Venezuela, from the Gulf of Venezuela to the Orinoco River (originally mistakenly referred to the Venezuelan Pliocene fossil species, *F. hollisteri*; shown here on Plate 2, Figures E, F; Plate 3, Figure C); *Fasciolaria bullisi* Lyons, 1972, which is widespread throughout the Gulf of Mexico, in lower neritic and bathyal depths; *Fasciolaria tephрина* DeSouza, 2002, which is found in bathyal depths from the Bay of Honduras south to northern Colombia; *Fasciolaria guyanensis* Lyons and Snyder, 2016, which is restricted to the coast of northern South America, from Guyana, Suriname, and French Guiana to Amapa State, Brazil and the Mouth of the Amazon River; and the new species, *Fasciolaria bittneri*, which is restricted to the southwestern edge of the Florida continental shelf off the Dry Tortugas, western Florida Keys. The genus *Fasciolaria* is not present, either as living or fossil taxa, in the

Brazilian and Paulinian Molluscan Provinces to the south, along the Brazilian coast.

The known fossil species of *Fasciolaria* include: *Fasciolaria semistriata* Guppy, 1874, which is known only from the early Pliocene Gurabo Formation of the Dominican Republic (Pilsbry, 1922; Woodring, 1928); *Fasciolaria mareana* Hollister, 1962, known only from the Pliocene Mare Formation of Venezuela; *Fasciolaria leura* Woodring, 1928, known only from the early Pleistocene (Gelasian Age) Bowden Formation of Jamaica; *Fasciolaria hollisteri* Weisbord, 1962, known only from the Pliocene Mare Formation of Venezuela (Weisbord, 1962); *Fasciolaria intermedia* Guppy, 1874, which is known only from the upper beds of the Gurabo Formation of the Dominican Republic; *Fasciolaria seminole* Petuch, 1994, which is known only from the Fort Denaud Member of the Caloosahatchee Formation, early Pleistocene (early Gelasian Age) of southern Florida (see Petuch, 1994); *Fasciolaria monocingulata* Dall, 1890, known only from the Fort Denaud Member of the Caloosahatchee Formation, early Pleistocene (early Gelasian Age) of southern Florida; *Fasciolaria calusa* Petuch, 1994, known only from the Bee Branch Member of the Caloosahatchee Formation, early Pleistocene (middle Gelasian Age) of southern Florida; and *Fasciolaria okeechobeensis* Tucker and Wilson, 1932, known only from the middle Pleistocene (Calabrian Age) Bermont Formation of southern Florida (Petuch and Berschauer, 2021 for illustrations of these Floridian fossil species).

Two undescribed Pliocene species are also known, and include a small, heavily-sculptured shell from the coral reef facies of the late Piacenzian Age Fruitville Member, Tamiami Formation of southern Florida, and another heavily-sculptured species from the early Piacenzian Age Jackson Bluff Formation at

Alum Bluff, Apalachicola River, in northwestern Florida. These paleospecies demonstrate that the genus was well-developed and widespread throughout Florida and the Caribbean Basin during both the Pliocene and Pleistocene.

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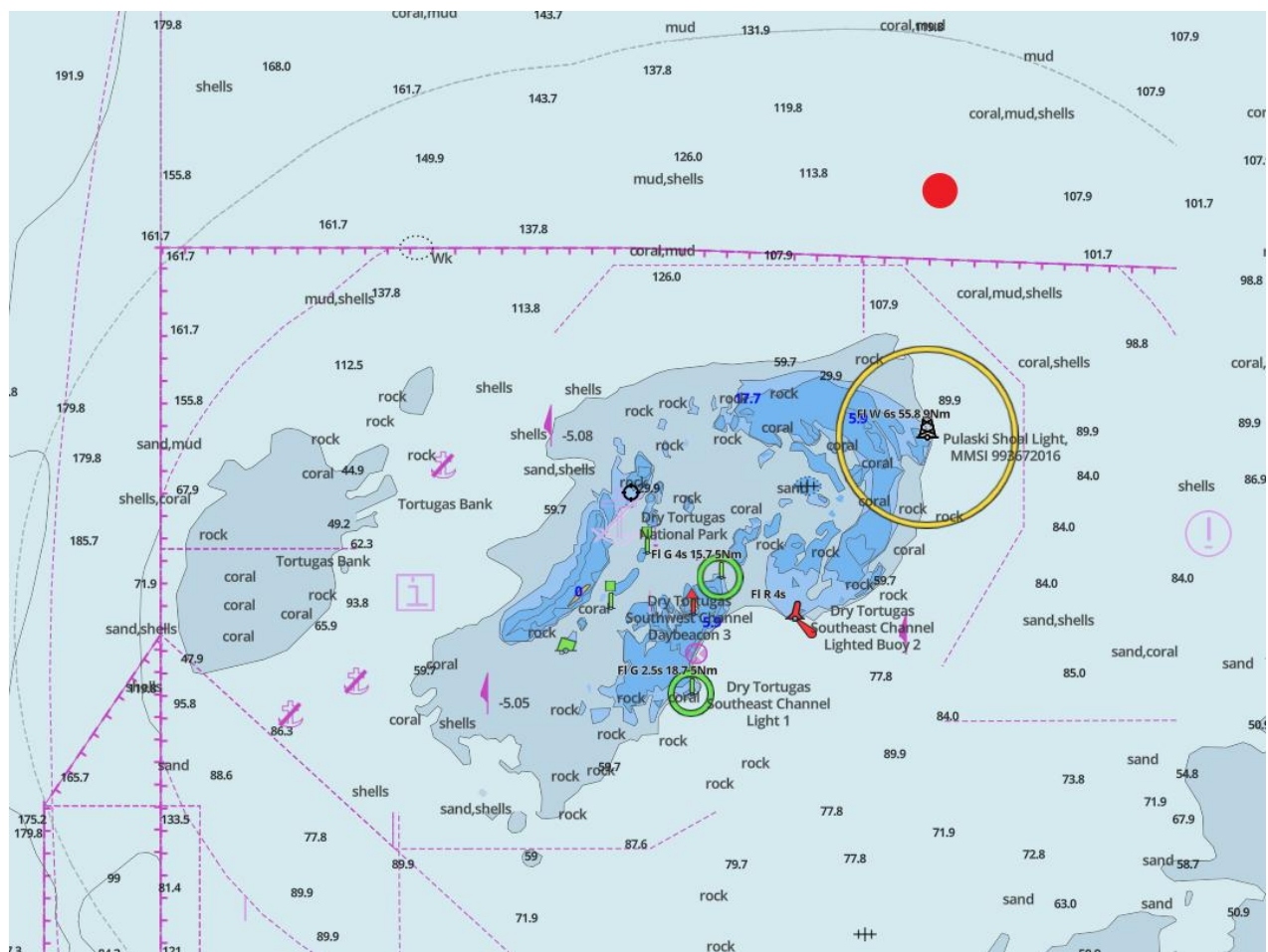


Figure 1. Map of the Dry Tortugas. The red dot indicates the approximate area where the type lot of *Fasciolaria bittneri* was found.

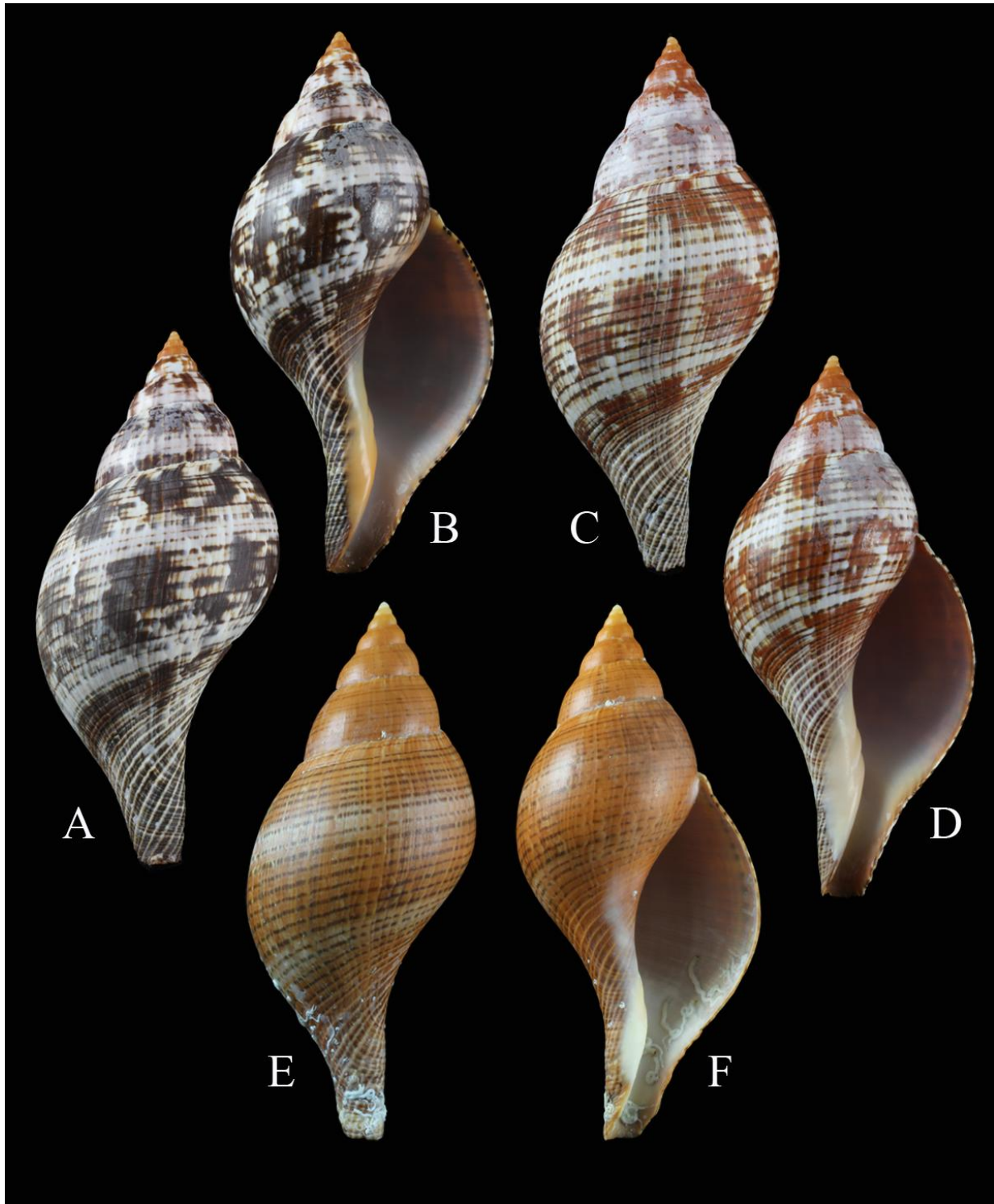


Plate 1. *Fasiolaria bittneri* Petuch and Berschauer, new species, from the Dry Tortugas.

A, B= holotype, length 115.1 mm, LACM 3807; **C, D=** paratype 5, length 115.2 mm, in the Berschauer research collection; **E, F=** paratype 2, length 117.9 mm, in the Petuch research collection. All three specimens were collected from deep water lobster traps set in 18-33 m depths off the Dry Tortugas, western Florida Keys, Monroe County, Florida.

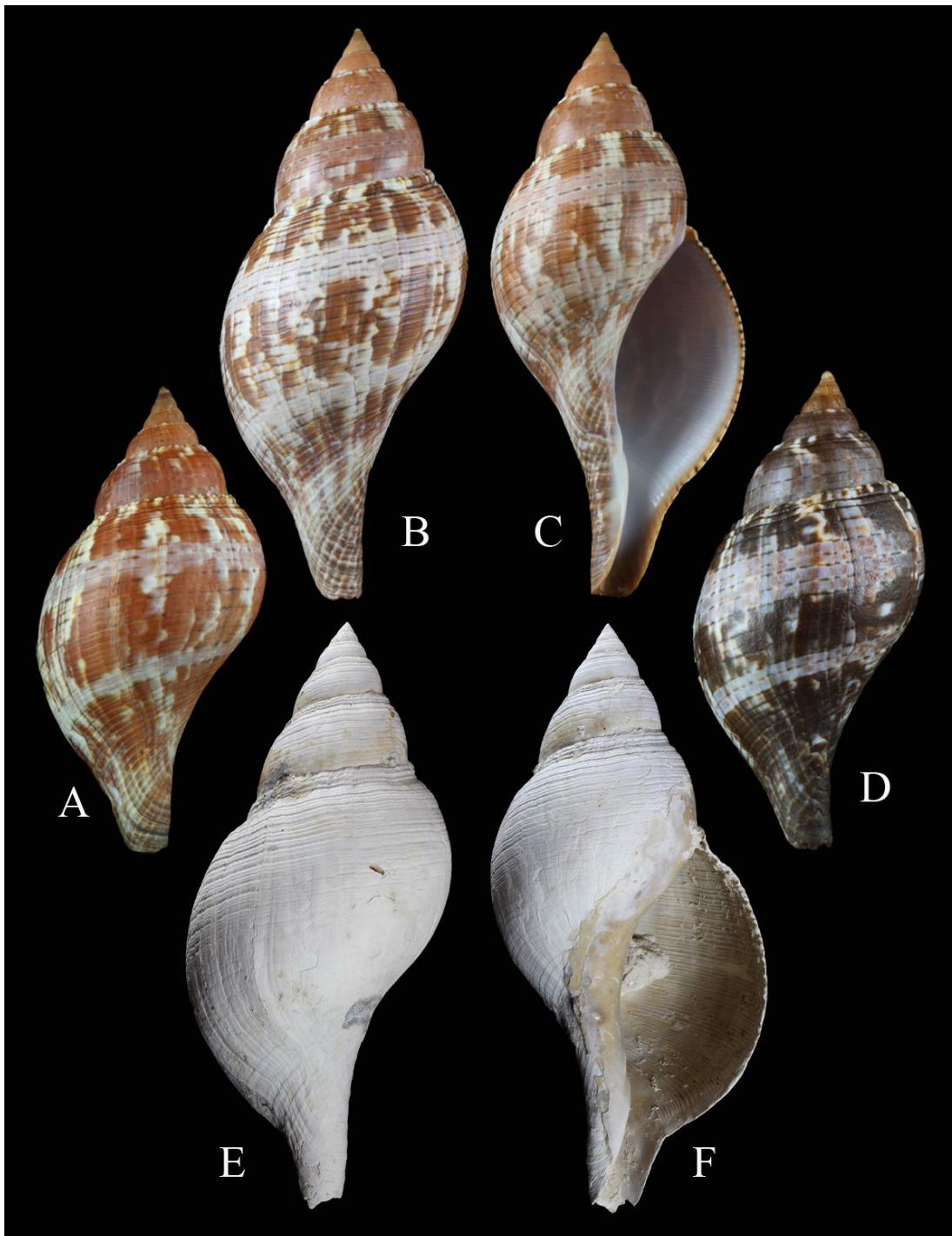


Plate 2. *Fasciolaria tulipa* (Linnaeus, 1758) and *Fasciolaria petuchi* Crabos and Queiroz, 2023, from Florida and Venezuela. **A=** *Fasciolaria tulipa* (Linnaeus, 1758), red color form, length 81.6 mm, from Turtle Key, Ten Thousand Islands, Collier County, Florida; **B, C=** *Fasciolaria tulipa* (Linnaeus, 1758), red color form, length 124.4 mm, from Sanibel Island, Lee County, Florida; **D=** *Fasciolaria tulipa* (Linnaeus, 1758), dark brown and purple color form, length 69.7 mm, from Turtle Key, Ten Thousand Islands, Collier County, Florida; **E, F=** *Fasciolaria okeechobeensis* Tucker and Wilson, 1932, length 240 mm, from the Holey Land Member, Bermont Formation, south Florida, ex Collection of Edward J. Petuch; all illustrated specimens in this plate are in the Berschauer research collection.

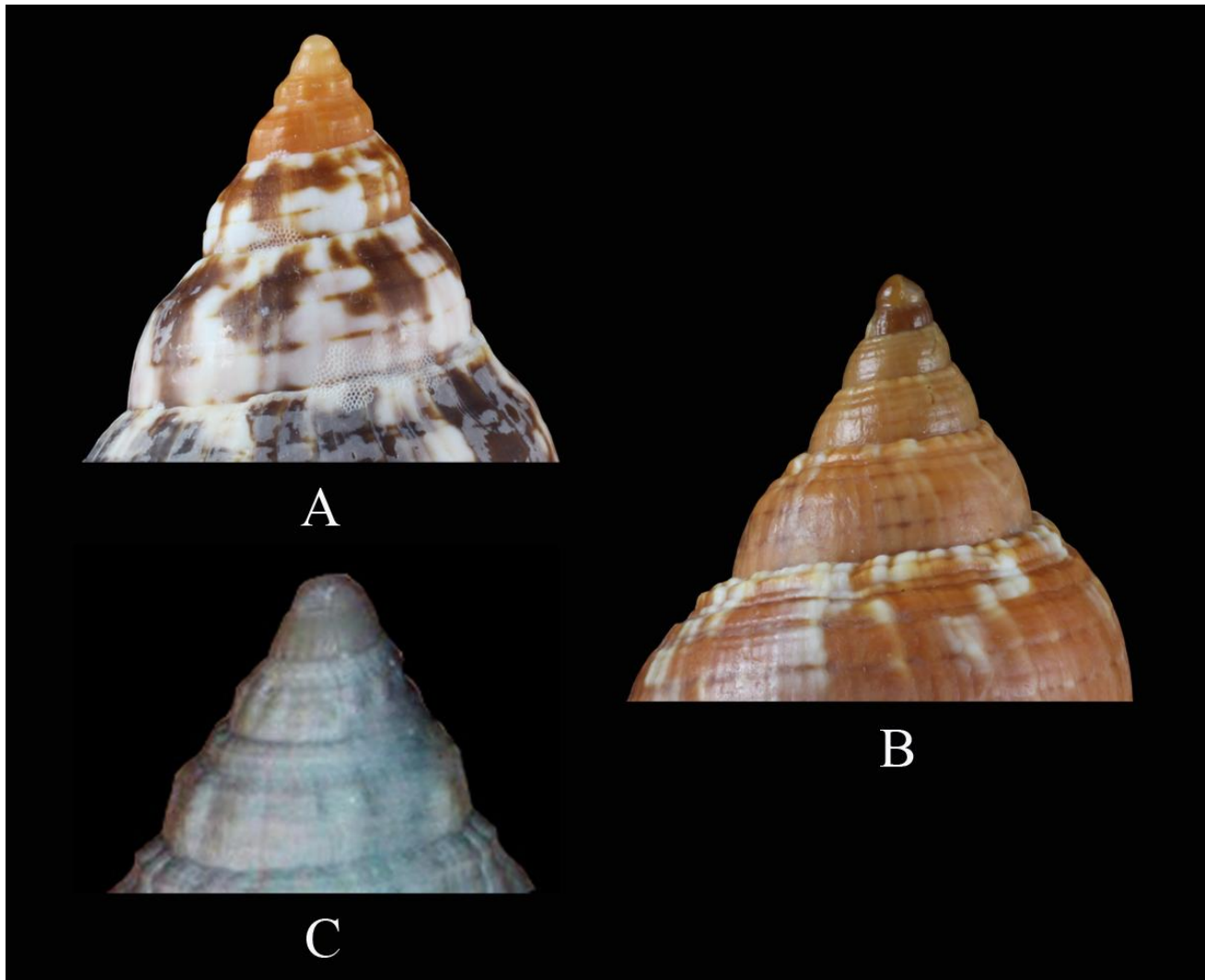


Plate 3. Protoconchs and Early Postnuclear Whorls of *Fasciolaria* Species.

A= early whorls of *Fasciolaria bittneri* new species, showing details of the knobbed shoulders of the postnuclear area; **B**= early whorls of *Fasciolaria tulipa* (Linnaeus, 1758), showing details of the smooth and corded postnuclear area; **C**= early whorls of *Fasciolaria okeechobeensis* Tucker and Wilson, 1932, for comparison with the two extant Florida species.