

A new species of *Zafrona* (Gastropoda: Columbellidae) from the Gulf of Mexico.

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Abstract. A new species of *Zafrona* from unusually deep water in the southeastern Gulf of Mexico is described and compared with other western Atlantic species.

INTRODUCTION

The Biology Department at the University of Louisiana at Lafayette (ULL) has been conducting research cruises in the Gulf of Mexico for more than two decades; these campaigns have led to many molluscan discoveries (e.g., García, 2003, 2005, 2006). The cruises have utilized the R/V *Pelican*, a vessel managed by the Louisiana Universities Marine Consortium (LUMCON).

In September, 2014 a cruise was conducted in the eastern Gulf of Mexico led by ULL marine biologists Drs. Darryl Felder and Suzanne Fredericq. It was the last of five cruises executed under the designation Gulf of Mexico Research Initiative (GoMRI), and comprised an area that began off the Mississippi River delta and terminated west of Dry Tortugas, Florida. Two types of dredges were used, the standard box dredge for shallower water with hard or rubble bottom, and the Benthic Skimmer, a large dredge specially designed for soft bottom (see García, 2007). The box dredge was in use when a specimen of an undescribed species of *Zafrona* was collected.

Radwin's studies in Columbellidae (1977a, 1977b, 1978) led him to place the genus *Zafrona* in the subfamily Columbellinae because of its different radular structure. Other distinguishing characters are one or two weak columellar denticles at anterior end, and a lip that "overhangs" the aperture slightly (1977b: 415); the latter is not restricted to *Zafrona* as some *Costoanachis* species have the same character. Although Radwin also states that the labrum of *Zafrona* is non-denticulate within, the western Atlantic species assigned to *Zafrona* do have a denticulate inner labrum, as Costa (2005) has further elaborated.

There are nine known species assigned to *Zafrona* that inhabit the western Atlantic, usually living in shallow, grassy areas. The new species was collected in a rubble bottom in 65 m, which is relatively deep for a *Zafrona*. Although the specimen was collected empty, it is presumed that the species does inhabit deeper water than other western Atlantic *Zafrona*, as the extensive shallow-water collecting done in the past in southern Florida, and lately by Dr. Rüdiger Bieler

in preparation for a future publication on this area (pers. comm., 10/16/2014), has not produced this species

SYSTEMATICS

Family **COLUMBELLIDAE** Swainson, 1840

Subfamily **Columbellinae** Swainson, 1840

Genus ***Zafrona*** Iredale, 1916

Type species: *Columbella isomella* Duclos, 1840 by original designation, Indo-West Pacific.

Zafrona tortugana n. sp

Figs. 1-7

Diagnosis. Teleoconch of 5.25 whorls, semi-translucent, yellowish, with first three whorls of a reddish brown coloration. Protoconch of 1.5 whorls, reddish-brown, color-banded sub-suturally on last whorl; axial sculpture conspicuous on all whorls; spiral sculpture, other than a subsutural band, appearing on last three whorls only.

Type material. Holotype USNM 1274996, length 8.8 mm, width 3.5 mm, dredged west of Dry Tortugas, Florida, 24°48.929'N, 83°40.609'W to 24°49.142'N, 83°40.587'W, in 65 m.

Type locality. West of Dry Tortugas, Florida, 24°48.929'N, 83°40.609'W to 24°49.142'N, 83°40.587'W, in 65 m.

Distribution. Known only from the type locality.

Habitat. The single, empty specimen of *Zafrona tortugana* was found in 65 m of water. in rubble bottom with some crushed shells. It seems to be the deepest recorded *Zafrona* (Rosenberg, 2009). Two key species also dredged in the same haul were *Conus attenuatus* Reeve, 1844 and *Ameranna florida* (García, 2008).

Description. Holotype (Figs. 1-3) 8.8 mm in length, fusiform (length/width ratio 2.51). Protoconch (Fig. 4) mamillate, of approximately 1.5 whorls; first whorl

rounded, protruding, reddish-brown; following whorl rapidly widening, convex, amber in color with a subsutural reddish brown band which continues on to the first teleoconch whorl. Transition to teleoconch marked by a shallow, sinuous scar. Teleoconch of approximately 5.25, moderately convex whorls. Suture incised but not deep. Axial sculpture on early whorls of strong, rounded ribs (Fig. 4); ribs becoming sharper on following whorls (Fig. 7), weaker on last whorl (Fig. 7); approximately 9 ribs on first whorl, 17 on second, 18 on third, and 22 on forth, exponentially increasing on last whorl; microscopic axial striae appearing on interspaces on early whorls, becoming stronger on last two whorls; axial sculpture on last whorl unevenly distributed. Spiral sculpture absent on first two whorls (Fig. 4), except for a sub-sutural "wrinkled" band (Fig. 5) which weakens after third whorl, becoming inconspicuous on later whorls (Compare Figs. 5 and 7); spiral sculpture gaining in strength after first two whorls, creating a reticulated pattern as it crosses major and minor axial elements. Aperture (Fig. 6) elongate-ovate; outer lip re-enforced with an weak varix; inner lip with seven weak denticles of almost equal strength; parietal wall with a thin, white shield which becomes slightly erect at edge at anterior half; an axially elongate, uneven callus developing towards anterior canal; callus creating a small denticle posteriorly. Shell coloration semi-translucent, yellowish, with reddish-brown hues on first three teleoconch whorls.

Remarks and comparisons

Although specimens of *Zafrona* are usually found in 2-3 m of water in grassy areas, this specimen was collected in rubble and at greater depths than other western Atlantic records for *Zafrona*. The holotype may be slightly immature, as the labral varix is weak, the edge of the labrum is rather thin, and the denticles inside the aperture are also weak.

Of the nine described *Zafrona* from the western Atlantic, *Zafrona dicomata* (Dall, 1889), *Z. pulchella* (Blainville, 1829), *Z. sunderlandi* Petuch, 1987, *Z. taylorae* Petuch, 1987 and *Z. macronata* Simone, 2009 have a very different sculpture and color pattern. The latter most probably does not belong in *Zafrona*. And *Zafrona idalina* (Duclos, 1840) and *Z. lindae* Petuch, 1992, are heavier, have an almost smooth shell, seldom with weak axial elements, and have different color patterns.

The two species with which *Zafrona tortugana* may be confused are *Z. diversa* Espinosa, Ortea & Fernández- Garcés, 2007 and *Z. belkisiae* Espinosa & Ortea, 2007. *Zafrona diversa* (Fig. 10), a Cuban species inhabiting shallow, grassy bottom, has a protoconch of one whorl, a dark grayish-brown coloration with a sub-peripheral light spiral band, a deeper suture, weaker axial elements, particularly on the last whorl, and a wider shell. *Zafrona belkisiae* (Figs. 8- 9), another Cuban species also inhabiting shallow, grassy bottom, has a pale, almost white protoconch of one whorl, very weak axial elements, a columella with two plaits, the posterior one reaching inside the aperture, a deeper suture, and a peripheral band of alternating white and dark grayish-brown spots, which appears supra-suturally on earlier whorls.

Etymology. In reference to the Dry Tortugas, the geographical location in which the specimen was found

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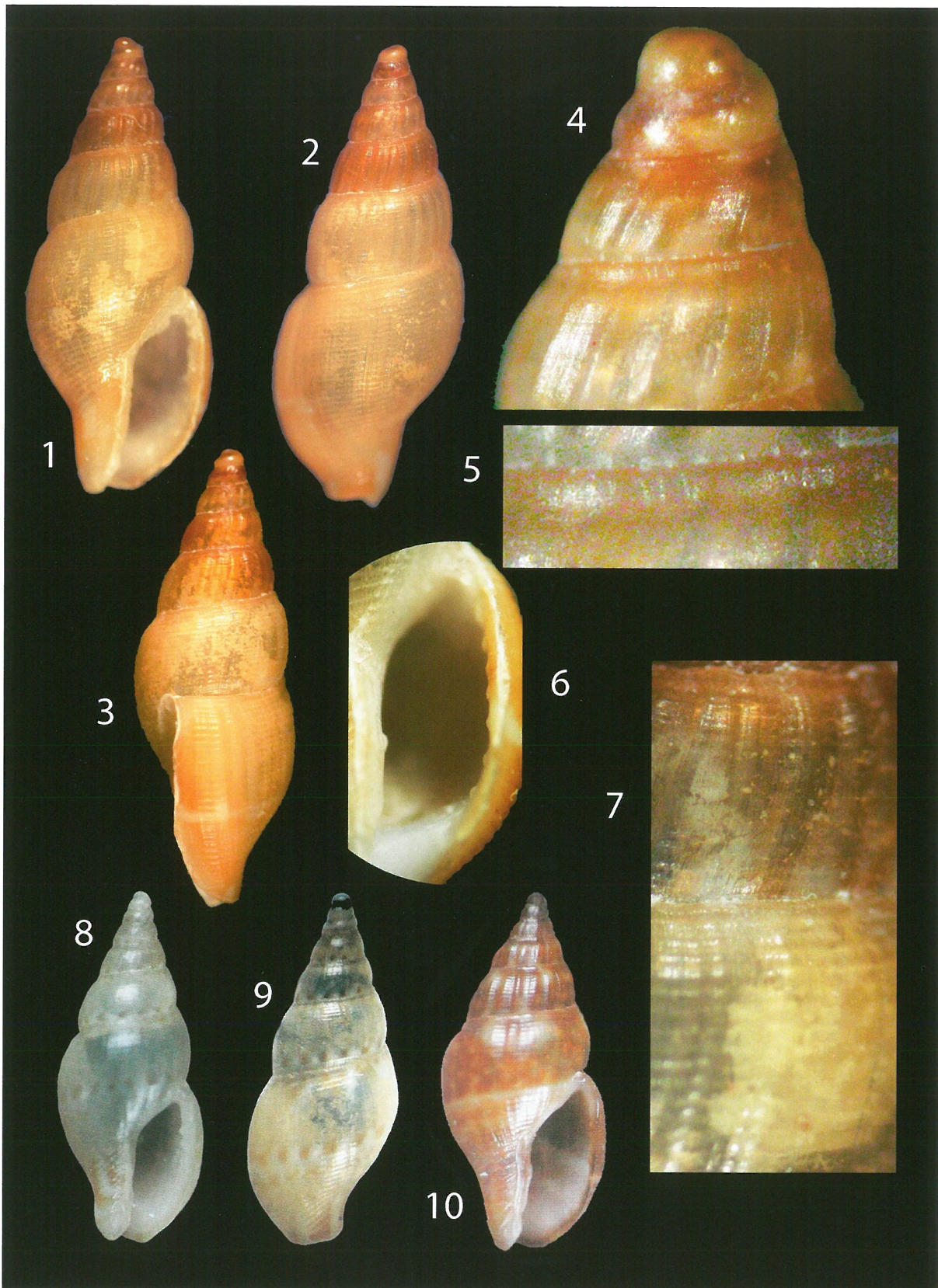
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Figures 1-10

1-7. *Zafrona tortugana* n. sp. Holotype, USNM 1274996, west of Dry Tortugas, Florida, 24°48.929'N, 83°40.609'W to 24°49.142'N, 83°40.587'W, in 65 m, length 8.8 mm, width 3.5 mm, in 65 m. **1-3.** Ventral, dorsal and side views. **4.** Protoconch and sculpture on first two teleoconch whorls. **5.** Sub-sutural band on second teleoconch whorl. **6.** Aperture showing labral denticles and columellar structure. **7.** Sculpture on penultimate and last whorls.

8-9. *Zafrona belkisiae* Espinosa & Ortea, 2007. Holotype, Instituto de Ecología y Sistemática (IES), Havana, Cuba, Ensenada de Bolondrón, Cabo de San Antonio, Cuba, length 9.2 mm, width 3.4 mm, in 1 to 2 m.

10. *Zafrona diversa* Espinosa, Ortea & Fernández- Garcés, 2007. Holotype, Instituto de Ecología y Sistemática (IES) Havana, Cuba, Cayo La Grifa, Golfo de Batabanó, Cuba, length, 9.45 mm, width 3.85 mm, in 2 to 2.5 m.



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