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Hesperaptyxis, a new genus for some western American Fasciolariidae (Gastropoda), with the description of a new species

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ABSTRACT

Hesperaptyxis is proposed as a new genus for *Turbinella cinerea* Reeve, 1847 and five other species from southern California and northwestern Mexico, including the new species *H. negusi*. It differs from *Aptyxis* Troschel, 1868 (Late Miocene to Recent, Mediterranean and temperate eastern Atlantic) by having a slightly upturned siphon and completely adherent inner lip. It differs from the Late Miocene western Atlantic genus *Pseudaptyxis* Petuch, 1988 by much more prominent axial and spiral sculpture and by lacking adapical and abapical sinuses on the outer lip. *Hesperaptyxis* is so far known fossil only from the Pliocene and Pleistocene.

Additional Keywords: Mollusca, Miocene, Pliocene, Pleistocene, recent, Baja California

INTRODUCTION

The classification of members of *Fusinus* Rafinesque, 1815 and related genera has long presented problems. Until recently, most species have been placed in the overly broad genus *Fusinus*. It has become clear, however, that although *Fusinus* and related genera form a clade, which Couto and colleagues (2016) call the *Fusinus colus* clade, there is substantial diversity in this group. Most attention has been focused on large-shelled species, leaving small-shelled taxa underrepresented in most recent studies. Russo (2015) treated the taxon *Aptyxis* Troschel, 1868, a member of the *F. colus* clade (Couto *et al*., 2016), assigning to it *Murex syracusanus* Linnaeus, 1758 (the type species, from the Mediterranean Sea and adjacent warm-temperate eastern Atlantic) and the Californian *Fusus luteopictus* Dall, 1877. Russo (2015) failed to note that Abbott (1954: 244) had previously assigned *Fusus luteopictus* to *Aptyxis*, and Keen (1958: 617–618) had assigned two additional eastern Pacific species, *Turbinella cinerea* Reeve, 1847 and *Fusinus felipensis* Lowe, 1935, to *Aptyxis*. Keen (1971) left the somewhat larger eastern Pacific *Fusinus fredbakeri* Lowe, 1935, in *Fusinus* sensu lato. No adequate description of *Aptyxis* has appeared to date, rendering generic assignments arbitrary at best. Our purpose in this article is to characterize these small species, to propose the new genus *Hesperaptyxis* for the small eastern Pacific species, to describe the new species *H. negusi* from Baja California, and to discuss the biogeographic conundrum presented by small northern-hemisphere fusinine fasciolariids. An institutional acronyms is: ANSP, Academy of Natural Sciences of Drexel University, Philadelphia, PA.

SYSTEMATICS

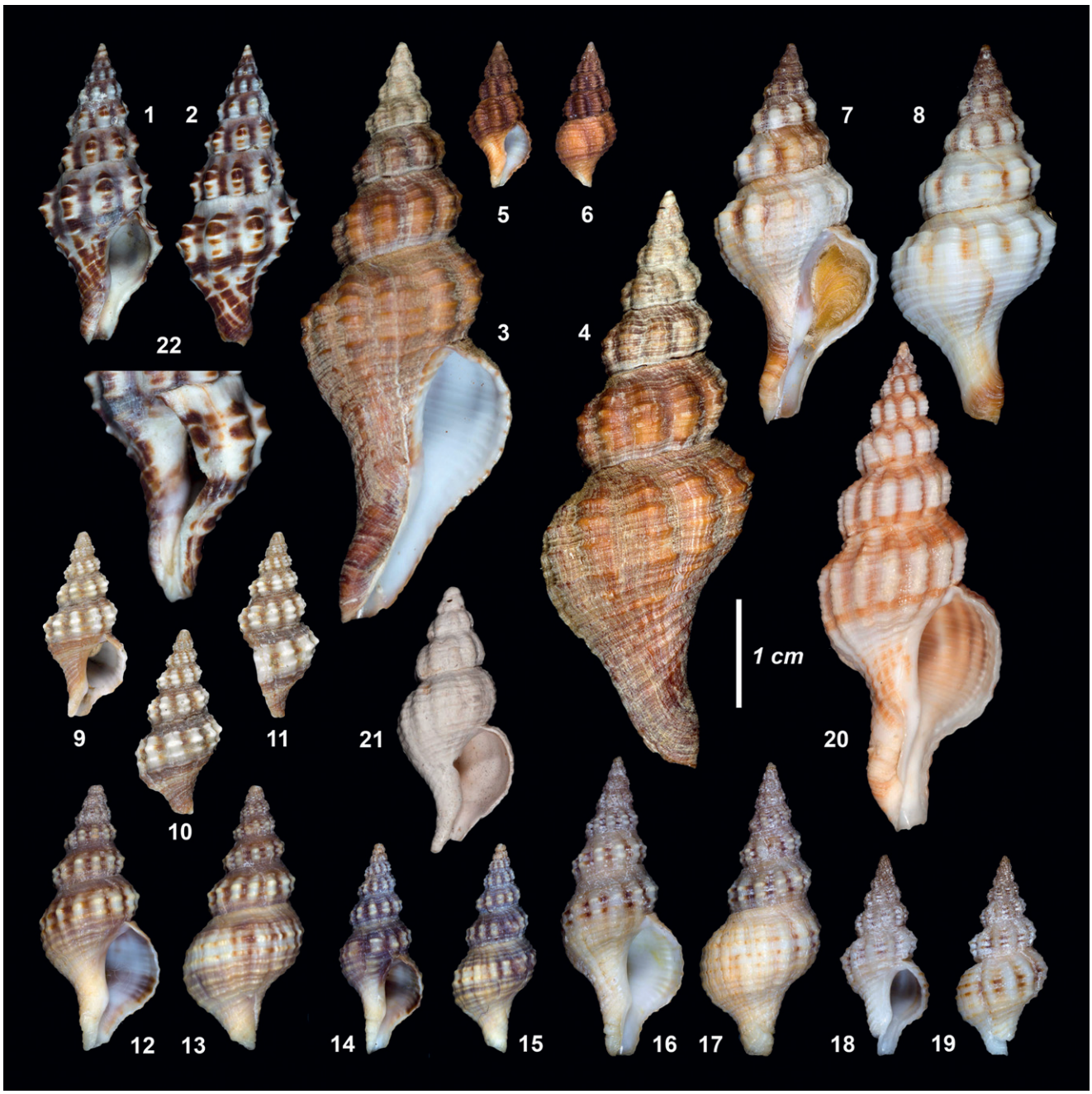
Family Fasciolariidae Gray, 1853
Subfamily Fusininae Wrigley, 1927

Genus *Hesperaptyxis* new genus

Type Species: *Turbinella cinerea* Reeve, 1847, designated herein (Recent, northwestern Mexico; Pliocene, Isla Carmen [Gulf of California, Baja California Sur State], Mexico; Pleistocene, Isla Coronados [Gulf of California Baja California Sur state], Mexico) (Figures 1, 2, 22)

Diagnosis: Small fusinine fasciolariids with angulated shoulder cord, convex outer lip, distinct abapical and adapical sinuses on the outer lip, and siphon with slightly upturned tip and inner lip adherent throughout its length.

Description: Shell small, maximum length about 70 mm, fusiform. Protoconch paucispiral. Teleoconch with up to 8 whorls. Suture accentuated by steep subsutural slope on all whorls. Teleoconch sculpture consisting of strong spiral cords and axial ribs. Shoulder cord angulated. Central cord at adapical end of base less prominent. Base strongly constricted. Spiral cords present on entire siphon. Tip of siphon slightly upturned (Figure 22). Aperture elongate-ovate. Outer lip crenulated at edge, smooth or weakly lirate within. Inner lip



Figures 1–22. **1, 2.** *Hesperaptyxis cinereus* (Reeve, 1847). ANSP 466447, off La Paz, Gulf of California, Baja California Sur, Mexico, 1992, 28.3 mm. **3, 4.** *Hesperaptyxis ambustus* (Gould, 1853). ANSP 466448, off Guaymas, Gulf of California, Sonora, Mexico, 1955, 54.9 mm. **5, 6.** *Hesperaptyxis felipensis* (Lowe, 1935). ANSP 466449, on underside of rocks as low tide, Puertecitos, Gulf of California, Baja California Norte, Mexico, 1985, 13.9 mm. **7, 8.** *Hesperaptyxis fredbakeri* (Lowe, 1935). 36.0 mm, live from Cholla Bay, Puerto Penasco, Gulf of California, Sonora, Mexico, ANSP 466450. **9–15.** *Hesperaptyxis luteopictus* (Dall, 1877). **9–11.** USNM 32350, Monterey, California., 17.5 mm. **12–15.** On rocks by Scuba at 6–9 m, Santa Cruz Island off Santa Barbara, California, 21.0 mm, 25.1 mm, **16–19.** *Hesperaptyxis negusi* new species. **16–17. Holotype,** ANSP 466446, live on rocks at 12–24 m, San Bonito Island [west of Cedros Island], Pacific Baja California, Mexico, 28.6 mm. **18–19. Paratype,** ANSP 466445, from type locality, 19.1 mm. **20.** *Aptyxis syracusanus* (Linnaeus, 1758). ANSP 466452, off southern Sicily, 1955 m, 46.6 mm. **21.** *Pseudaptyxis santamariae* Petuch, 1988. ANSP 52871, late Miocene (Turtonian) St. Mary's Formation, Maryland, 26 mm. **22.** *Hesperaptyxis cinereus* (Reeve, 1847). ANSP 466447, 28.3 mm, off La Paz, Gulf of California, Baja California Sur, Mexico, 1992, anterior part of shell, 28.3 mm.

smooth, columellar margin resorbed in posterior third, callused and slightly produced in anterior third, with transition between (Figure 22). Single entrance fold at base of siphonal canal, shallow abapical sinus present on outer lip, aperture slightly folded at terminus of suture.

Included Species: *Turbinella cinerea* Reeve, 1847 (Figures 1, 2); *Fusus ambustus* Gould, 1853 (Figures 3, 4); *Fusinus felipensis* Lowe, 1935 (Figures 5, 6); *Fusinus fredbakeri* Lowe, 1935 (Figures 7, 8); *Fusus luteopictus* Dall, 1877 (Figures 9–15); *Hesperaptyxis negusi* new species (Figures 16–19). (The upturned canal tip was previously noted for *Fusinus fredbakeri* by Hertz et al. (1999: 80, table 2): [canal] "tip bent to left".)

Etymology: Combination of *Hesperia* (Greek, land to the west) and *Aptyxis*.

Comparisons: In shell characters, *Hesperaptyxis* is extremely similar to *Aptyxis* Troschel, 1868, type species *Murex syracusanus* Linnaeus, 1758, from the Mediterranean Sea and adjacent warm-temperate eastern Atlantic. Although there have been occasional placements of additional Mediterranean species in *Aptyxis*, we are basing our comparison on the type species, *Murex syracusanus* (Figure 20). The genus *Aptyxis* differs from *Hesperaptyxis* by having a straight siphon without upturned tip and by having the abapical end of the inner lip, at the distal end of the siphonal canal, forming a detached edge to the left margin of the canal. This occurs in roughly 50% of mature specimens (n=12).

Another similar genus is *Pseudaptyxis* Petuch, 1988, based on *P. santamariae* Petuch, 1988 from the Late Miocene (Tortonian) St. Mary's Formation of Maryland. Our examination of the holotype of *P. santamariae* (ANSP 52871) (Figure 21) shows that this small species (length about 25 mm) differs from both *Aptyxis* and *Hesperaptyxis* by much finer spiral and axial sculpture and by having a straight outer lip without abapical and adapical sinuses. The outer lip is smooth within, and a parietal tooth or ridge is absent. *Pseudaptyxis* resembles *Hesperaptyxis* in having the tip of the siphon slightly upturned. In this respect, *Hesperaptyxis* and *Pseudaptyxis* differ from the eastern Atlantic *Aptyxis*. In addition, the shoulder is rounded in *Pseudaptyxis*, whereas it is more or less angulate in *Aptyxis* and *Hesperaptyxis.*

***Hesperaptyxis negusi* new species**
(Figures 16–19)

Description: Shell small, slender, to about 29 mm, with short siphonal process. Protoconch broken or missing in all specimens examined. Teleoconch of 8 convex whorls at maturity, constricted at sutures. Axial sculpture of about 12 ribs on early and penultimate whorl, 18 on body whorl, morphing on last whorl to weak axial ridges toward lip. Ribs stop short of suture posteriorly and anteriorly. Spiral cords on entire teleoconch, to tip of neck, about 5 on early whorls, 6 on penultimate whorl with intercalated weaker cords; spiral sculpture weaker on body whorl. Anterior sutural ramp steep with strong cord at base, 3–4 close–set cords on ramp. Rounded knobs where spiral cords cross axial ribs, evanescent on second half of body whorl. Siphonal process short, straight, with slightly upturned tip. Aperture elongate-ovate, glazed white within with raised cords terminating short of lip; small entrance fold at base of siphonal canal. Parietal callus resorbed, blending smoothly into exterior shell surface. Columellar margin of siphonal canal raised. Operculum typical of genus, thin, light caramel color. Shell background color pale to light brown. Spiral cords dark brown between axial ribs, cream color at knobs where crossing axial ribs. Remnants of one protoconch suggest a dark caramel color.

Type Material: Holotype (Figures 16–17): ANSP 466446, length 28.6 mm, live on rocks at 12–24 m, 1989; Paratype (Figures 18–19), length 19.1 mm, live on rocks at 12–24 m, ANSP 466445; Both from type locality.

Type Locality: San Benito Island [west of Cedros Island], Baja California State, Mexico.

Etymology: Named for Rick Negus, who recognized the taxon as an unnamed species and donated the holotype and paratype.

Distribution: From Santa Cruz Island south to San Benito Island.

Remarks: *Hesperaptyxis negusi* is most closely related to *H. luteopictus*, being of similar size and shape, and sharing the same or similar habitats. It is easily distinguished from *H. luteopictus* by its more slender and elongated profile and its less prominent sculpture. *H. luteopictus* is purplish brown with white spiral bands where prominent centrally placed cords cross raised portions of axial ribs, forming sharply pointed knobs. *H. negusi* has a smoother more rounded surface sculpture.

BIOGEOGRAPHY

Despite their great similarity in shell characters, species of the eastern Atlantic *Aptyxis* and eastern Pacific *Hesperaptyxis* are separated by a large geographic gap. *Aptyxis* has been part of the southern European and eastern Atlantic fauna since at least the Late Miocene and Pliocene (see Landau et al., 2013). *Hesperaptyxis* is known only from fossils from the Pliocene and Pleistocene of the Gulf of California, with records of *H. cinereus* from Isla Carmen (Pliocene; Durham, 1950) and Isla Coronados (Pleistocene; Emerson and Hertlein, 1964). No similar species are known from the rich Neogene faunas of the Caribbean region. Petuch (1988) described *Pseudaptyxis* for the single species *P. santamariae* from the Late Miocene of Maryland. Here again, no similar

taxon is known that might connect this genus phylogenetically with either *Aptyxis* or *Hesperaptyxis*. These biogeographic separation corroborates a taxonomic separation among these three very similar genera.

The restriction of *Hesperaptyxis* to the coasts of southern California and northwestern Mexico has parallels in other molluscan genera. The closest parallel is with the ocenebrine muricid genus *Mexacanthina* Marko and Vermeij, 1999, whose three species are common intertidal gastropods on rocky shores of the Pacific side of Baja California and the Gulf of California. Like *Hesperaptyxis*, *Mexacanthina* has no obvious relatives in the Neogene or Recent fauna either in western North America or elsewhere. It converges in form on the phylogenetically distinct eastern Atlantic genus *Spinucella* Vermeij, 1993 (Early Miocene to Late Pleistocene).

Another geographically restricted genus in the living fauna is *Macron* H. and A. Adams, 1853, with a modern distribution coincident with that of *Hesperaptyxis* and *Mexacanthina*. In this case, however, there are fossil species in the Early Miocene of Venezuela (Gibson-Smith et al., 1997) and the Miocene of Chile (Nielsen and Frassinetti, 2003). Other examples are *Megastraea* McLean, 1970 (Turbinidae), *Liocerithium* Tryon, 1887 (Cerithiidae), *Myrakeena* Harry, 1985 (Ostreidae) and *Austrotrophon* Dall, 1902 (Muricidae: Ocenebrinae). Hypotheses for how these restricted distributions came to be have not been offered, but it is clear from these examples and from *Hesperaptyxis* that the region from southern California to the subtropical coasts of the Gulf of California is geographically unique.

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