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Permalink
https://escholarship.org/uc/item/60t8262h

Journal
NAUTILUS, 130(3)

ISSN
0028-1344

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Publication Date
2016-09-02

Peer reviewed
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, 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 fusine 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 fusine fasciolariids with angulated shoulder cord, convex outer lip, distinct adapical and abapical 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 sub-sutural 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...
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 felpensis Lowe, 1935 (Figures 5, 6); Fusinus fredbakeri Lowe, 1935 (Figures 7, 8); Fusus luteopicthus 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. luteopicthus, being of similar size and shape, and sharing the same or similar habitats. It is easily distinguished from H. luteopicthus by its more slender and elongated profile and its less prominent sculpture. H. luteopicthus 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 Lundau et al., 2013). Hesperaptyxis is known only from fossils from the Pliocene and Pliocene of the Gulf of California, with records of H. cinerea from Isla Carmen (Pliocene; Durham, 1950) and Isla Coronados (Pliocene; 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 ocenebrii muricid genus Mexacantha 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, Mexacantha 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 Mexacantha. 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 Megastrea McLean, 1970 (Turbinidae), Liocerithium Tryon, 1857 (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.

ACKNOWLEDGMENTS

The authors thank Rick Negus for providing the original material which stimulated an examination of the small-shelled west American Fasciolariidae. We also thank Paul Callomon, collections manager at ANSP, for photographing the specimens and assembling the plates, as well as for helpful discussions and observations.

LITERATURE CITED


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