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A new species of *Tucetona* (Bivalvia: Glycymerididae) from Mexico

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While reviewing the Glycymerididae of the Panamic Province we encountered an unusual species of *Tucetona* Iredale, 1931, in the Gulf of California, Mexico. After examining type and related specimens at museums in the USA and UK, we have determined the species is new to science. It is herein named *Tucetona isabellae*. In our description we use morphological characteristics outlined in Tschudin (2001) and Squires (2010).

Abbreviations: ANSP—Academy of Natural Sciences, Philadelphia, USA; BMNH—The Natural History Museum, London, UK; CAS—California Academy of Sciences, San Francisco, USA; LACM—Natural History Museum of Los Angeles County, Los Angeles, USA; SBMNH—Santa Barbara Museum of Natural History, Santa Barbara, USA; USNM—United States National Museum of Natural History, Washington, D.C, USA.

Genus *Tucetona* Iredale, 1931

Pectunculus Lamarck, 1799, *non* da Costa, 1778. Type species (monotypy): *Arca pectunculus* Linnaeus, 1758. Holocene, IndoPacific.

Tucetona Iredale, 1931. Type species (original designation): *Pectunculus flabellatus* Tenison-Woods, 1878. Holocene, southwestern Pacific.

Bellaxinaea Nicol & Jones, 1984. Type species (original designation): *Axinaea intercostata* Gabb, 1860. Eocene–Oligocene, southeastern U.S.

Description. Shell subcircular to subtrigonal; beaks orthogyrate, small to moderate in size, narrow to broad; sculpture of about 18–46 rounded to rectangular radial ribs, bifurcate in some species, commarginal striae weak to strong; interspaces narrow to moderately wide, shallow to moderately deep; posterior and anterior adductor scars and pallial line well impressed; hinge plate moderately curved, narrow to moderately wide; teeth straight to moderately curved; hinge plate of about 18–20 taxodont teeth; ligament with 3–5 chevron grooves.

This genus differs from *Axinactis* Mörch, 1861, which has fewer, wider radial ribs with moderately wide interspaces, deep radial grooves on the ribs and interspaces, and a moderately broad beak. This genus differs from *Glycymeris* da Costa, 1778, which has low, rounded, smooth radial ribs that do not bifurcate, narrow interspaces, and a narrow beak. Species with a greater tendency for rib splitting, such as *Tucetona bicolor* Reeve, 1843, have been segregated as subgenus *Bellaxinaea.*

Tucetona isabellae Valentich-Scott & Garfinkle, new species

Figures 1A–G

Glycymeris (*Glycymeris*) *cabazoni* Bramkamp, 1935, unnumbered pages, plate 2, figures 2, 3; *Tucetona* (*Bellaxinaea*) new species, Powell, 1986: 79–81, plate 2, figures 5, 7.

Shell shape. Subovate to subtrigonal, moderately inflated, height and length about equal; beaks narrow, pointed, opisthogyrate.

Sculpture and color. About 29 (20–48, n=15) heavy, broad radial ribs, many bifurcate in larger specimens, overlain by strong, fine, well-spaced, commarginal ribs forming crossbars over ribs and in interspaces; interspaces moderately wide, frequently with intercalary ribs; periostracum inconspicuous; exterior color tan, with few dark brown blotches; interior color white to cream, with brown mottling in some specimens, some specimens mostly brown internally.

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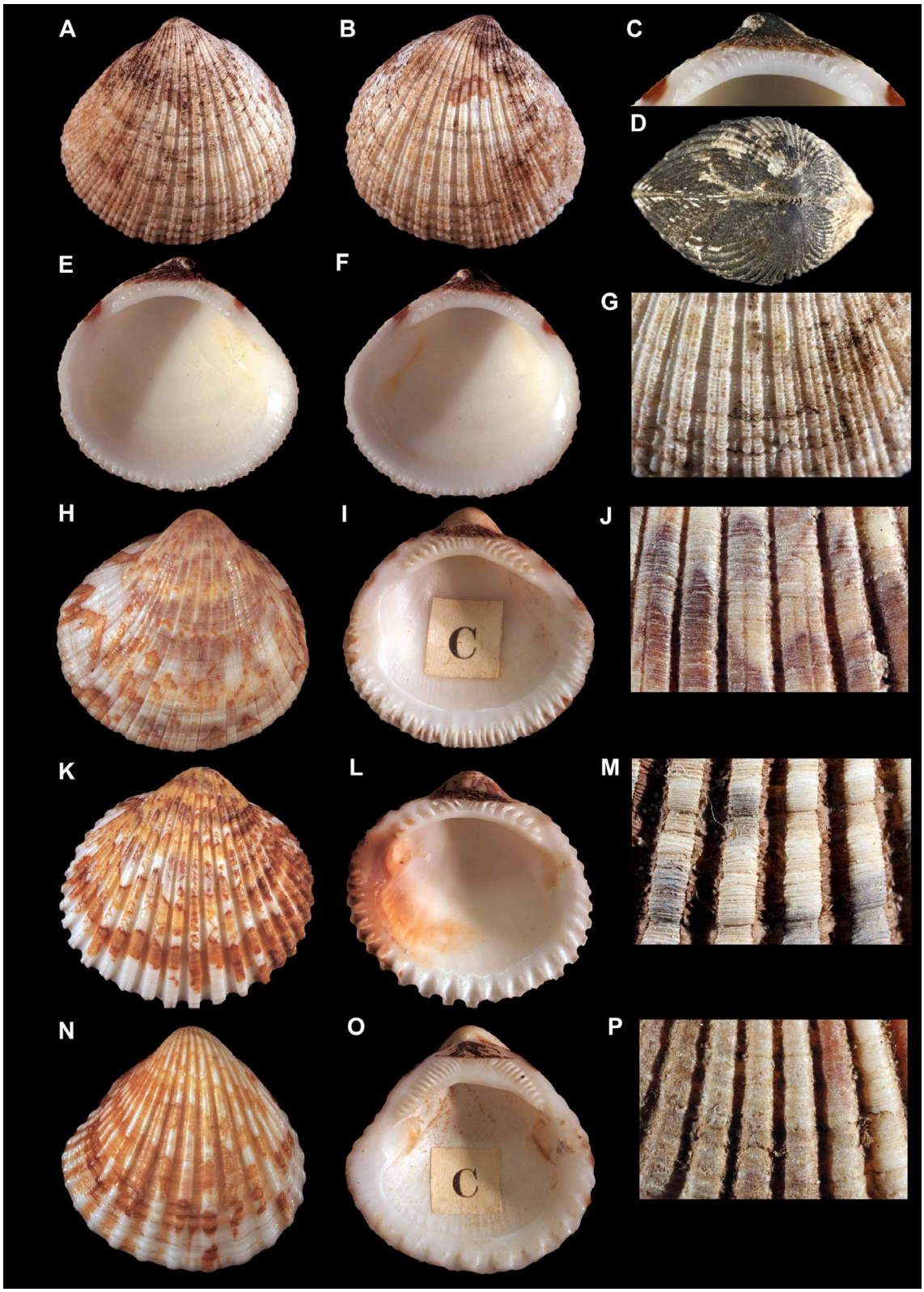

FIGURE 1. A–C, E–G. *Tucetona isabellae* **new species**, holotype (SBMNH 149636) length = 14.5 mm. A. Exterior of right valve. B. Exterior of left valve. C. Hinge of left valve. D. Paratype (SBMNH 149637) length = 12.6 mm. Dorsal view of both valves joined. E. Interior of right valve. F. Interior of left valve. G. Close up of ribs of right valve. H–J. *Tucetona bicolor*, H–I. syntype (BMNH 19534201) length = 27 mm. H. Exterior of left valve. I. Interior of right valve. J. Close up of ribs of right valve (SBMNH 149638), length = 35.5 mm. K–M. *Tucetona multicostata*, K–L. syntype (BMNH 196714) length = 36 mm. K. Exterior of right valve. L. Interior of left valve. M. Close up of ribs of left valve (SBMNH 149640), length = 37 mm. N–P. *Tucetona strigilata*, N–O. syntype (BMNH 196712) length = 29 mm. N. Exterior of left valve. O. interior of left valve. P. Close up of ribs of left valve (SBMNH 149639), length = 28.2 mm.

Hinge. Hinge plate curved, narrow, posterior tooth series about 8 (4–11, n=10), anterior about 7 (3–11), ligament asymmetrical, much longer anteriorly, moderate in length, moderately narrow, with about 3 (2–6) chevron grooves.

Adductor muscle and pallial scars. Moderate in size, moderately impressed, anterior scar subovate, posterior scar ovate-elongate; pallial line narrow, with long, narrow dorsally directed lines extending from it.

Inner ventral crenulations. About 24 (14–43) rectangular, flat topped.

Distribution. Modern specimens are only known from a small region off the northwest end of Isla Smith, Baja California, Mexico (29.1° N), 120–170 m. Fossil specimens are present in the late Miocene "Imperial" Formation in Riverside County, southern California (Powell, 1986; 1988).

Type locality and type specimens. Mexico, Baja California, off the northwest end of Isla Smith; 29°05'12"N, 113°32'12"W; 120–170 m. All paratypes listed below are from the same lot as the holotype.

Holotype. SBMNH 149636, length 14.5 mm, height 15.0 mm. **Paratypes.** SBMNH 149637, 34 paired valves, 31 separate valves; BMNH 20100629, 2 paired valves, 2 separate valves; CASIZ 184502, 3 paired valves; USNM (1149245), 2 paired valves, 2 separate valves.

Etymology. Named in honor of Isabella M. A. Rocha from Santa Barbara, California, a close friend of the junior author.

Comparisons. *Tucetona isabellae* differs from *Tucetona bicolor* Reeve, 1843 (Figures 1H–J), which has a subtrigonal shell shape, about 39 radial ribs with moderately shallow, very narrow interspaces, with very fine, very closely spaced commarginal ribs, and a moderately wide, curved hinge plate. *Tucetona multicostata* G. B. Sowerby I, 1833 (Figures 1K–M) has a subovate shell shape, about 32 non-bifurcate radial ribs with wide, deep interspaces, with moderately spaced commarginal ribs, and a moderately wide, curved hinge plate. *Tucetona isabellae* differs from *Tucetona strigilata* G. B. Sowerby I, 1833 (Figures 1N–P), which has a subtrigonal shell shape, about 24 non-bifurcate radial ribs with moderately wide, moderately shallow interspaces, with very fine, closely spaced commarginal ribs, and a wide hinge plate with curved teeth.

The North Atlantic *Tucetona pectinata* (Gmelin, 1791) has fewer, non-bifurcating radial ribs with narrow interspaces when compared to *T. isabellae*. The new species has a similar number of radial ribs when compared to the northern Atlantic *Tucetona subtilis* Nicol, 1956, but the ribs are not bifurcate, and the latter species has fewer teeth on the hinge plate.

Remarks. *Tucetona isabellae* has also been found in the fossil record although never formally described (Bramkamp, 1935; Powell, 1986). Powell (1986) compares this species to two fossil species from Venezuela and Columbia, both of which have significant differences in dentition and ligamental grooves, and thus are not included in the comparisons above.

We have done a close examination of the Panamic members of the genus *Tucetona* and found that it has been difficult to differentiate the species. Many of the specimens in the museum collections we examined were incorrectly identified due to a misunderstanding of important characters within the genus. We found that the most distinct differences between the different Panamic species were, 1) presence or absence of rib bifurcation, 2) width and depth of interspaces, 3) size of the commarginal ribs, and 4) the width of the hinge plate. These characters alone can still sometimes lead to incorrect identifications. Further study, using molecular tools, likely would produce additional characters and might lead to the discovery of additional new species.

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