

A new species of *Malea* (Mollusca: Tonnoidea) from the Lower Miocene Cantaure Formation of Venezuela

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Abstract A new species of *Malea* (Tonnoidea, Mollusca) is described from the Lower Miocene Cantaure Formation of the Paraguaná Peninsula (Venezuela). The very endemic nature of the *Malea* taxa found in the Neogene Colombian-Venezuelan-Trinidad Subprovince of the Gatunian Province is highlighted, with more than half of all the known Tropical American species restricted to this subprovince.

Keywords: Tonnoidea, Mollusca, *Malea*, Miocene, Cantaure Formation, Venezuela, new species

INTRODUCTION

The molluscan fauna of the late early Miocene (Burdigalian) shellbeds at Cantaure, on the Paraguaná Peninsula, Falcón, Venezuela, was described by Jung (1965). However, numerous other taxa have been collected from this very diverse locality subsequently. The largest collection is that made by Jack and Win Gibson-Smith, now housed in the Naturhistorisches Museum Basel, Switzerland. The author has also visited the locality on several occasions to collect fossil gastropods; some of this material remains in my private collection (BL coll.) and some has been presented to the Naturhistorisches Museum Wien.

In his recent revision of tropical American Neogene tonnoideans, Beu (2010) figured and discussed the shell studied here, but did not describe it formally, as it is the only known specimen. Despite two further visits to Cantaure, no further tonnid shells have been found. In view of the rapid deterioration of the "upper bed" exposure (sensu Gibson-Smith & Gibson-Smith 1979) (BL personal observation) we are unlikely to find further specimens in the near future. As part of this series of papers formally describing the taxa found in the Cantaure assemblage (Landau & Vermeij 2010) we take the opportunity of describing this unusual and important taxon.

Material and Methods

The specimen described here was found by me in 2005, and is now deposited in the Naturhistorisches Museum Wien (NHMW coll.), Vienna.

SYSTEMATIC PALAEOLOGY

PHYLUM MOLLUSCA

CLASS GASTROPODA

SUPERFAMILY TONNOIDEA Suter, 1913 (1825)

Family TONNIDAE Suter, 1913 (1825)

Genus *Malea* Valenciennes, 1883

Malea maxwelli n. sp.

Figs 1, 2

Malea n. sp. A Beu 2010, p. 262, pl. 77, figs 3, 4.

Type material and dimensions. Holotype NHMW 2009z0075/0001, height 36.8, width 26.7 mm (Figs 1, 2).

Type locality. Cantaure Formation (early Miocene: Burdigalian), upper shell bed (of Gibson-Smith & Gibson-Smith 1979), 1 km SW of Casa Cantaure, about 10 km west of Pueblo Nuevo, Falcón, Venezuela.

Diagnosis. A *Malea* species with a very small shell, an evenly rounded last whorl, spiral sculpture of relatively narrow, elevated primary cords with 2 secondary threads in each interspace, and a well-developed parietal ridge on the inner lip callus pad.

Description. Shell very small and relatively solid for genus, globose, with short spire. Protoconch eroded. Teleoconch of five convex whorls, with periphery at the abapical suture on spire whorls. Suture impressed, very narrowly canaliculate. Spiral sculpture of relatively narrow, rounded spiral cords, three on spire whorl, 11 on last whorl, separated by interspaces each somewhat wider than one cord, bearing two narrow spiral threads in each interspace. Weaker subsutural cord present on last three whorls, followed abapically by narrow, slightly concave sutural ramp delimited by first primary spiral cord. Axial sculpture of close-set, prosocline growth lines, especially strong on early whorls. Last whorl 83% total height, globosc, evenly rounded, constricted at base. Aperture elongate, narrow, widening abapically. Outer lip thickened by narrow but prominent labial varix, somewhat flared abapically. Lip slightly concave, beveled inwards.

bearing 13 narrow lirae that extend right across beveled inner part of the lip. Lirae form sharp denticles crenulating both inner and outer edges of lip. Second and third denticles more closely set than others, almost fused; mid-apertural denticle thicker than others. Anal canal narrow, deep; siphonal canal short, open, very wide, strongly abapically recurved. Parietal callus greatly expanded, sharply delimited,

closely adherent. Parietal pad thickened over spiral cords adapically, forming well-defined parietal ridge. Adapical portion of columella convex, deeply excavated below. Abapical half of columella bearing several oblique folds and elongated denticles. Siphonal fasciole very short, rounded, abaxially recurved.



Figures 1-2

Malea maxwelli n. sp., holotype, NHMW 2009z0075/0001, height 36.8, width 26.7 mm; Cantaure Formation (early Miocene: Burdigalian), upper shell bed, Casa Cantaure, Paraguaná Peninsula, Falcón, Venezuela.

Discussion. Although represented by a single specimen, *Malea maxwelli* n. sp. is quite distinctive in having one or two obvious but narrow spiral threads in each primary spiral interspace, in having many low, narrow, sharply defined, rather widely spaced axial ridges over the entire teleoconch surface (as in *Endolium* – Marshall 1992; and as in juvenile specimens of *Tonna galea* (Linnaeus, 1758)) and in having a well-defined parietal ridge, very prominent over the uppermost (most posterior) spiral cords on the inner lip callus pad, and visible as an angling ridge on the next three cords below that. *Malea maxwelli* n. sp. also has a very small shell for the genus, and it is possible that this is an aberrant small specimen. However, the shell illustrated (Figs 1, 2) appears to be fully mature. *Malea* shells tend to be fragile and often only fragments of the outer lip are found, but despite numerous field-trips to the Cantaure outcrop, I have never seen fragments of larger *Malea* shells. Although Beu (2010) recorded this shell as coming from the lower (main) shellbed (= NMB 17016) near Casa Cantaure, it was actually found in the “upper shell bed” of Gibson-Smith & Gibson-Smith (1979) in

association with *Cymatophos paraguayensis* (Hodson, 1931), which only occurs in the “upper bed”.

Malea maxwelli n. sp. is one of the earliest records of the genus from tropical America. Beu (2010) reported *Malea elliptica* Pilsbry & Johnson, 1917 from the coeval Baitoa Formation of the Dominican Republic. *M. elliptica* differs from *M. maxwelli* n. sp. in its more elongate, less globose last whorl, with the shoulder placed higher, the spiral cords are more close-set, and neither *M. elliptica* nor any other *Malea* species has the spiral threads present in the interspaces of the Cantaure shell. Moreover, the well-defined parietal ridge seen in *M. maxwelli* is far less developed in *M. elliptica*. *Malea maxwelli* is more similar in shell shape to *Malea camura* Guppy, 1866 from the Gurabo Formation, Upper Miocene of the Dominican Republic, but has an even more evenly rounded last whorl and again differs in the details of the spiral sculpture. *Malea camura* has a shorter and wider shell and more widely spaced primary spiral cords than *M. elliptica*. As in *M. elliptica*, the parietal ridge is also less developed than in *M. maxwelli*. *Malea goliath* Pilsbry & Johnson, 1917, which Beu (2010) recorded from the Caribbean Neogene from the late Lower

Miocene Baitoa Formation to the Pliocene Cayo Agua Formation, is immediately distinguished from the new taxon by having a very large, wide shell, with very wide, flat-topped spiral cords separated only by very narrow grooves. *Malea densecostata* (Rutsch, 1934) from the Lower Pliocene Punta Gavilán Formation of Venezuela is also easily distinguished, as the name would suggest, by its narrow, close-set spiral cords.

Landau et al. (2008) discussed the endemic nature of the Neogene molluscan assemblages found in northern Venezuela, fully justifying the erection of the Colombian-Venezuelan-Trinidad Subprovince of Woodring (1974), which seems to have been in place since at least the early Miocene (Landau et al. 2008). The genus *Malea* illustrates this endemism clearly, with four of the nine species recorded by Beu (2010) from Neogene to Recent faunas of tropical America endemic to the Colombian-Venezuelan-Trinidad Subprovince. *Malea* is also an example of a paciphile gastropod (see Woodring 1966; Landau et al. 2009), which according to the fossil record seems to have had its origins in the Atlantic portion of the Neogene Gatunian Province (Vermeij & Petuch 1986; Vermeij 2005; Landau et al. 2008) but now, within the American region, is limited to the eastern tropical Pacific.

Etymology. The species name commemorates Phil Maxwell, friend and guide to the wonderful fossil localities on the South Island of New Zealand.

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