



### The youngest rostroconch mollusc from North America, *Minycardita capitanensis* n. sp.

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Rostroconchs are an extinct class of mollusc that lived worldwide through most or all of the Paleozoic Era (Runnegar 1978). They were most diverse in the early Paleozoic (Pojeta 1985), perhaps due to a lower rate of evolution in the rostroconch clade that survived the end-Ordovician mass extinction event (Wagner 1997). Rostroconchs have a univalved larval shell and a pseudo-bivalved adult shell. Their ecology appears to have ranged from infaunal to rarely epifaunal, and from deposit to suspension feeding (Pojeta *et al.* 1972, Pojeta & Runnegar 1976, Runnegar 1978, Pojeta 1987). A single but well-preserved, essentially complete rostroconch specimen was recovered from the region surrounded by the famous Capitan Reef of the Permian of West Texas (Newell *et al.* 1953). In particular, the specimen is from the upper scaphopod bed of the Reef Trail Member of the Bell Canyon Formation exposed in the Guadalupe Mountains National Park (Rigby & Bell 2005: fig. 2). The fusulinid biostratigraphic zonal indicator *Paraboultonia splendens* Skinner & Wilde, 1954 occurs both below the upper scaphopod bed and above it, indicating that this horizon was deposited during the latest Guadalupian (late middle Permian) (Rigby & Bell 2006), and thus is the youngest known deposit in North America to contain a rostroconch. Most known Permian rostroconchs have been recovered from rocks in North America, and only one occurrence stands out as clearly younger than this one: *Pseudoconocardium* Zavodowsky, 1960 from the Late Permian of Siberia, a large rostroconch that differs significantly in shape and ornamentation from rostroconchs of the late Paleozoic in North America (Hoare *et al.* 2002). Permian rostroconchs are rare, having been described from only sixteen localities worldwide (listed in Hoare & Plas 2003). In contrast, rostroconchs were relatively abundant during the preceding Pennsylvanian (Hoare *et al.* 2002). Thus the occurrence described herein represents the youngest known record of the North American rostroconch lineages, and is one of the last snapshots of a major molluscan clade.

The specimen described here was recovered from the Reef Trail Member of the Bell Canyon Formation at or near United States Geological Survey (USGS) Locality 7663 (=GUMO [Guadalupe Mountains National Park] GEO 00006), at 31°49'45"N, 104°52'18"W on the Guadalupe Pass 7.5' quadrangle (Rigby & Bell 2005, 2006). The bed, from which the rostroconch was recovered, is a densely fossiliferous skeletal debris flow that probably originated from the margin of the Capitan Reef (Rigby & Bell 2006). A deep water habitat of approximately 520 m about 1.5 km from the shelf margin has been reconstructed for this locality (Newell *et al.* 1953; Rigby & Bell 2006).

The specimen was photographed using a Zeiss Discovery V12 dissecting microscope with Zeiss planapochromatic 0.63x lens, objective slider, and a Zeiss Axiocam HRC (Carl Zeiss, Oberkochen). Most images were taken with the iris diaphragm fairly closed; a few images were z-stacked with *Heliconfocus* (Heliconsoft, Ukraine). Images of the specimen were also taken via a Zeiss EVO 40XVP scanning electron microscope (SEM) at the Santa Barbara Museum of Natural History (SBMNH); the specimen was uncoated and variable pressure secondary electron detector was used under variable pressure. Measurements were made using *ImageJ* (National Institutes of Health, Bethesda, Maryland). Rostroconch terminology used herein was defined and illustrated by Pojeta & Runnegar (1976), Pojeta (1987), Hoare (1989: fig. 3), and Wagner (1997: fig. 2). The rostrum (tube) is on the posterior side of the specimen and the protoconch is dorsal.

The specimen is housed in the reference collections at the headquarters of the Guadalupe Mountains National Park (GUMO), Salt Flat, Texas, USA.