



Taxonomic reassessment of *Planorbis llanerensis* from the Neogene of Monagas state, Venezuela (Gastropoda, Planorbidae)

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ABSTRACT

In the 1940's, a fossil freshwater pulmonate was found in an excavation site in Monagas state, Venezuela (Las Piedras/Quiriquire Formation, Pliocene), and was described as *Planorbis llanerensis* Palmer, 1945. The genus *Planorbis* Müller, 1773, however, is now considered to be Palearctic; all its supposed South American species had their allocation in this genus revised. Thus, here we present a taxonomic reassessment of this species, resulting in the new combination *Helisoma llanerensis*.

Keywords: *Helisoma llanerensis* comb. nov., Las Piedras Formation, Pliocene, Quiriquire Formation, Tertiary.

INTRODUCTION

In the 1940's, a single fossil of a freshwater pulmonate snail was found in an excavation site in Monagas state, Venezuela, likely belonging to the Pliocene Quiriquire Formation (PALMER 1945). That fossil was then described as *Planorbis llanerensis* Palmer, 1945 (Planorbidae). However, the genus *Planorbis* Müller, 1773 is now considered to be almost exclusively Palearctic in distribution (ZILCH 1959–1960; SOLDATENKO & STAROBOGATOV 2000; WELTER-SCHULTES 2012); all South American species previously classified as such have been transferred to more appropriate genera (*e.g.*, SIMONE & MEZZALIRA 1994; SIMONE 2006). Curiously, Palmer (1945) already noted this, but did not delve further into this matter. As such, here we present a taxonomic revision and reassessment of *P. llanerensis* and reallocate it in the planorbid genus *Helisoma* Swainson, 1840 (type species *Planorbis campanulatus* Say, 1821), resulting in the new combination *H. llanerensis*. We also take this opportunity to offer updated diagnosis and description of this fossil, properly figure it, and also briefly discuss its troublesome stratigraphical provenance and age.

MATERIAL ANALYZED

The single specimen is housed at the collection of the Paleontological Research Institution (PRI; Ithaca, USA) and thus, despite not being in a very good state of preservation, two replicas of it were made and housed at the Museu de Zoologia da Universidade de São Paulo (MZSP 113406; São Paulo, Brazil) and the Staatliches Museum für Naturkunde Stuttgart (SMNS101151; Stuttgart, Germany).

SYSTEMATICS

Genus *Helisoma* Swainson, 1840

Helisoma llanerensis (Palmer, 1945) **comb. nov.**

Planorbis llanerensis Palmer, 1945: 8, 24 (pl. 3, fig. 2–3); Nuttall, 1990: 342.

Material analyzed: PRI 20103 (holotype; E. Mencher, N.E. Weisbord & O. de Sola col., xi/1944).

Diagnosis: Aperture rounded quadrangular, large, greatly expanded “downwards”.

Redescription: Shell large, pseudodextral, planispiral; spire sunken; width approximately twice shell length. Protoconch large, flattened. Teleoconch apparently smooth. Whorls widely growing, with enlarged apertural region. Suture deep. Aperture large and greatly expanded “downwards”, rounded quadrangular, orthocline; ~2/5 shell width. Umbilicus very wide, deep. Body whorl with apparent carina on basal portion (but this seems to be an artifact of preservation; PALMER 1945).

Measurements: 3¼ whorls; height = 11.7 mm; width = 23.4 mm.

Distribution: Known only from the type locality.

Type locality: As in Palmer (1945): “a low hill along the east bank of the Guatatal [sic] River, east of La Llanera and 17.1 km as the crow flies north of Caicara in the State of Monagas, Venezuela.” A few remarks should be made here: (1) the name of the river is misspelled, its correct name is Guatatal River (“Río Guatatal”, in Spanish); (2) by Caicara, the author probably meant the city of Caicara de Maturín, very close to the river.

Stratigraphic occurrence and age: Probably Las Piedras Formation, Pliocene (but see the “Geological Setting” section below).

GEOLOGICAL SETTING

Palmer (1945) refers to the description of the outcrop by Norman E. Weisbord (one of the collectors of the material): “Most of the fossils are found loose on the surface and come from a somewhat calcareous clay with a little finely disseminated gypsum. The clay is blue-gray, several feet below the surface, and weathers above to a yellowish-brown soil. Occasional blocks of coquina made up mostly of *Corbicula* and *Ostomya* are strewn about, and several botryoidal calcite nodules an inch or two in diameter have been observed.” Also on Weisbord’s opinion, the outcrop would be equivalent to the Quiriquire Formation to the east, referring the fossils to the Pliocene (more likely) or to the Pleistocene (PALMER, 1945).

The Quiriquire Formation was considered part of the Sacacual Group together with the Las Piedras Formation (HEDBERG 1950; RENZ 1957), but the group's name is now invalid and the formations are treated separately (SALVADOR 1961). The Quiriquire Formation ranges from the very Late Miocene to the end of the Pliocene, while Las Piedras Formation ranges from the late Middle Miocene to the end of the Pliocene; as such, the upper strata of the latter laterally correlate with the former, while its lower strata correlate with the La Pica Formation (RENZ 1957; PDVSA 2011). Both Quiriquire and Las Piedras are overlain by the Pleistocene Mesa Formation (RENZ 1957; PDVSA 2011).

The Quiriquire Formation is restricted to a small area around its type section in the Quiriquire field and the other coeval outcrops in Monagas state are often referred to the Las Piedras Formation (HEDBERG 1950; PDVSA 2011). Therefore, due to the locality and the description of the outcrop given by Palmer (1945), we echo here the opinion of Hedberg (1950) that the material, and thus *Helisoma llanerensis*, probably comes from the upper strata of the Las Piedras Formation, being Pliocene in age. Unfortunately, the geology of Venezuela, and especially of Monagas, has historically been studied mainly in the context of petroleum exploration (AYMARD *et al.* 1990 and references therein) and thus the fossil content of the country's formations never received due attention. All sources only refer vaguely to "freshwater faunas" (or, in the best scenarios, "freshwater mollusks") for the above mentioned formations (PDVSA 2011 and references therein), but never go so far as to properly identify or illustrate them, greatly hampering comparative paleontological (and even biostratigraphical) studies.

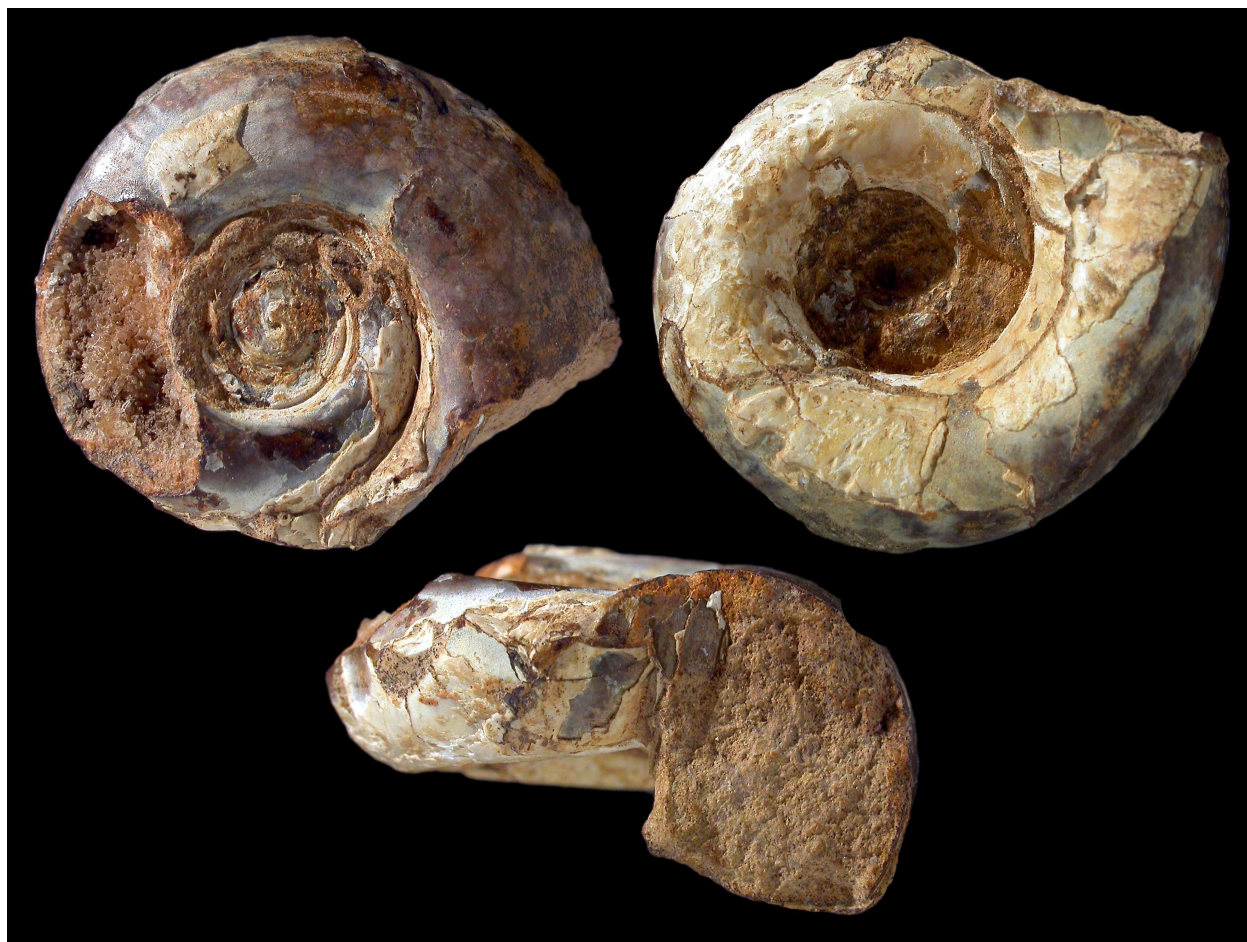


Figure 1. *Helisoma llanerensis* in apical, umbilical and apertural views (Holotype PRI 20103; shell width = 23.4 mm).

DISCUSSION

The shell features of the present fossil compares fittingly with the North American genus *Helisoma*: a large size, few whorls widely increasing in size, and an enlarged apertural region (BAKER 1945). The only other *Helisoma* fossils in South America are the two unnamed morphospecies reported by Wesselingh (2006) from the Peruvian Pebas Formation (late Lower to early Upper Miocene), the oldest records for the genus. However, the very fragmentary nature of this material precludes proper comparison with *H. llanerensis*.

Helisoma is unknown in the recent South American fauna (SIMONE 2006) and, thus, *H. llanerensis* is the last known record of the genus for this continent. Still, as would be expected of congeners, *H. llanerensis* bears some resemblance to a few recent species, like for instance *H. duryi* (Wetherby, 1879) and some forms (or supposed subspecies) of *H. anceps* (Menke, 1830) from North America (BAKER 1945). However, *H. llanerensis* shows some striking diagnostic features (besides its age and locality) that make it readily identifiable, such as its large, rounded-quadrangular aperture, greatly expanded “downwards”.

The fossil continental snail fauna of northern South America is mainly composed of non-pulmonates (e.g., DE GREVE 1938; PARODIZ 1969; NUTTALL 1990; SIMONE & MEZZALIRA 1994; WESSELINGH 2006) and seems to be more related to the faunas of Central and North America than to the remainder of South America. This curious feature is also seen in some recent pulmonate snail families (SCOTT 1996, 1997) and, as such, the fossil record seems to indicate that this relationship was already established since the Miocene at least. This topic will be further explored in an upcoming paper.

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