

## HEAD UP ITS POSTERIOR LOBE, A REPLY TO AGNOLÍN AND CHIMENTO (2025)

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*Abstract.* Recently, Agnolín and Chimento (2025) erected a new species of land tortoise, called *Chelonoidis pucara* Agnolín & Chimento, 2025, from the Pleistocene of Buenos Aires Province, Argentina, based on the holotype MLS 227, identified as “the anterior half of the plastron of an adult male individual”. Based on this identification, the authors recognize peculiar and unique characters, including the absence of a gular pocket and epiplastral lip, the presence of horn-like projections, and the presence of a large entoplastron with a midline suture, allowing the identification of a new species of *Chelonoidis*. Careful examination of the figures and drawings of Agnolín and Chimento (2025, figs. 2A-C, fig. 3A) reveals a misidentification of the specimen: what is identified as the anterior half of the plastron is actually the posterior half — the images need to be rotated 180 degrees. If done, then the morphology becomes clear. Seen properly, the characters observed in the holotype of *Chelonoidis pucara* are not enough to distinguish a new species of tortoise or *Chelonoidis*, therefore *Chelonoidis pucara* is considered invalid and more specifically, a *nomen dubium*.

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According to traditional anatomical studies of turtle shells — particularly in tortoises — published over the past century (e.g., Wermuth & Mertens 1961; Pritchard 1979; Pritchard & Trebbau 1984; Ernst & Barbour 1989; Richard 1999; Cabrera 2022) and in key book chapters (e.g., Zangerl 1969), the shell consists of a carapace connected to the plastron by the bridge. The plastron is clearly

divided into anterior and posterior lobes, which are joined by the plastral bridge — forming the three main elements of the plastron.

In extant and extinct tortoise species, these sources describe the anterior lobe as comprising a pair of epiplastra, a pair of hyoplastra, and a single (unpaired) entoplastron. The posterior lobe consists of a pair of hypoplastra and a pair of xiphiplastrum. The entoplastron is the only unpaired bone of the plastron. In addition to differences in the num-

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ber and arrangement of plates, the anterior and posterior lobes of the plastron also exhibit significant morphological distinctions. The anterior lobe typically displays rounded epiplastral edges. According to Auffenberg (1974), in the most specialized tortoises (e.g., *Chelonoidis* spp.), the epiplastra are thickened at a certain distance on either side of the midline and on the dorsal surface, a morphology called epiplastral lip. At the posterior margin of this thickening, the elevation drops abruptly to the level of the entoplastron. In some cases, the elevation is so developed and extended posteriorly that it partially overhangs the entoplastron, forming the so-called gular pocket. In contrast, the posterior lobe is characterized by lateral margins that converge and taper posteriorly, ending in pointed xiphiplastral tips that frame a variably deep and broad anal notch — through which the tail is visible in living tortoises.

Recently, Agnolín and Chimento (2025) erected a new species of land tortoise, called *Chelonoidis pucara* Agnolín & Chimento, 2025, from the Pleistocene of Buenos Aires Province, Argentina, based on the holotype MLS 227 (material deposited Museo Legado del Salado, Junín City, Buenos Aires province, Argentina). The material is identified as “the anterior half of the plastron of an adult male individual” (Agnolín and Chimento 2025: 244). Based on this identification, the authors recognize peculiar and unique characters, including the absence of a gular pocket and epiplastral lip, the presence of horn-like projections, and the presence of a large entoplastron with a midline suture, allowing the identification of a new species of *Chelonoidis*.

If true, these characters would have been enough not only for the erection of a new species, but for an entire new family or suborder. Based on the phylogenetic framework of Vlachos and Rabi (2018), the medial notch of the epiplastron could indicate a position outside *Chelonoidis*, the horn-like epiplastral projections could indicate close relationships with the Indian taxon *Megalocbeys*, the absence of gular pocket and epiplastral lip along with wide and short gulars would indicate a placement towards the basal parts of Testudinidae or even outside the crown group as a branching stem Testudinidae. Finally, the presence of a large entoplastron with a midline suture would be enough to distinguish *Chelonoidis pucara* not only from any other tortoise, but from any other turtle as well,

living or extinct; there are no turtles with a double entoplastron. Finally, another character that is observed in the drawings of Agnolín and Chimento (2025), but is not mentioned in the text, is the absence of a midline sulcus crossing the entoplastron. Is *Chelonoidis pucara* the strangest tortoise or turtle known to record?

Careful examination of the figures and drawings of Agnolín and Chimento (2025, figs. 2A-C, fig. 3A) reveals a serious misidentification of the specimen (Fig. 1A): what is identified as the anterior half of the plastron is the posterior half — the images need to be rotated 180 degrees (Fig. 1B). If done, then the morphology becomes clear: the purported horn-like epiplastral projections become xiphiplastral projections, the absence of any lip or pocket makes sense in the xiphiplastra, the wide, almost straight and short gulars become “normal” anal scutes, and, of course, the double entoplastron is simply a fragment of the medial part of the hypo/xiphiplastra (see comparison with a *Chelonoidis carbonaria* plastron; Chelonian Research Institute Collection 319, Fig. 1C). It is important to note that in the original specimen there are no sutures that indicate the presence of an entoplastron.

Seen properly, the characters observed in the holotype of *Chelonoidis pucara* are not enough to distinguish a new species of tortoise or *Chelonoidis*, as only a few diagnostic characters exist in the posterior lobe. The observed morphology is quite similar to that of other known and coeval species, such as the Late Pleistocene *Chelonoidis lutzae* Zaccarías, de la Fuente, Fernández, and Zurita (2013) from the Late Pleistocene of Corrientes Province. *Chelonoidis lutzae*, for example, also has a deep anal notch with strong xiphiplastral projections and similar femoral and anal scutes in shape and form. The only difference that *Chelonoidis pucara* shows is its large size, which is indeed much larger than most other known fossils of *Chelonoidis* in Argentina and South America. However, a size character is not a diagnostic character (see Das 1997), and it is not acceptable by any modern standards, especially if we take into account the size variation, intraspecific variation, and sexual dimorphism observed in extant and extinct tortoises (see Pérez-García and Vlachos 2014 and references therein). Based on all the above, *Chelonoidis pucara* is considered invalid and more specifically, a *nomen dubium*; the available material can be only identified as *Chelonoidis* sp.

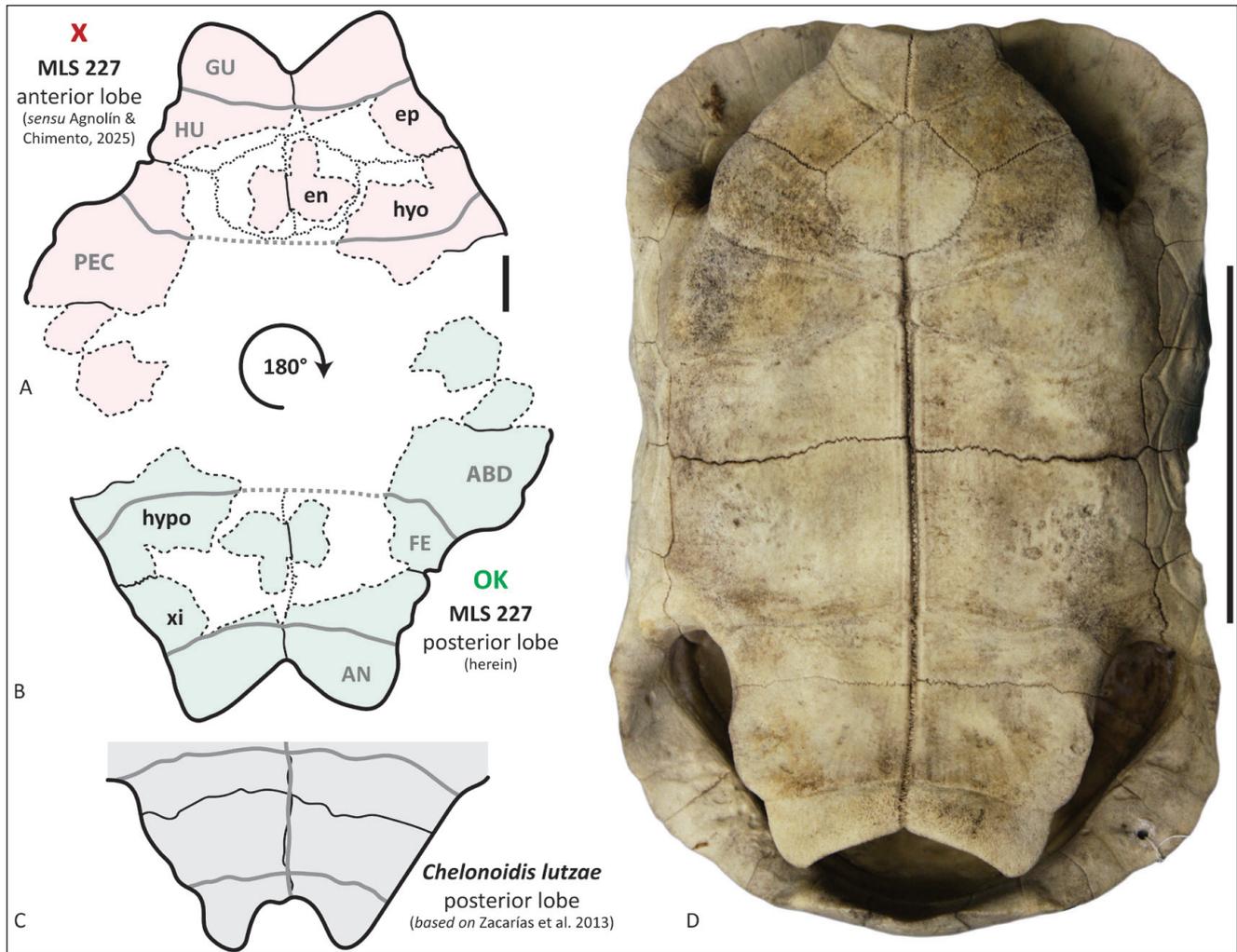


Fig. 1 - Reinterpretation of the holotype of *Chelonoidis pucara* Agnolín and Chimento, 2025. A) Line drawing of the original interpretation of Agnolín and Chimento (2025) as an anterior lobe, showing the interpreted sutures (black lines), horny scute sulci (dark grey lines), and broken sides (with dashed lines). B) Correct interpretation of the specimen as part of a posterior lobe of a tortoise, after rotating the specimen 180 degrees. C) Schematic drawing of the posterior lobe in ventral view of the holotype of *Chelonoidis lutzae* (CTES-PZ 7391) based on the figures of Zacarías et al. (2013), not in scale. D) The shell of an extant specimen of *Chelonoidis carbonaria* (CRI 319) in ventral view, showing the external surface of the plastron, used as a comparative example for the typical morphology of the plastron in tortoises. Scale bars equal 10 cm. Abbreviations (bony plates in small and horny scutes in capital letters): ABD, abdominal scute; AN, anal scute; en, entoplastron; ep, epiplastron; FE, femoral scute; GU, gular scute; HU, Humeral scute; hyo, hypoplastron; hypo, hypoplastron; PEC, pectoral scute; xi, xiphiplastron.

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