A new and large short-necked chelid turtle from the Loncoche Formation (Late Campanian-Early Maastrichtian) Mendoza Province, Argentina: Macro, microanatomy, and preliminary phylogenetic relationships

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Background. The lower section of the Loncoche Formation (Late Campanian-Early Maastrichtian) outcropping at Ranquil-Có locality (Mendoza province, Argentina) has yielded a rich assemblage of vertebrates (comprising fish, amphibians, and reptiles) that was studied in 1995 by Gonzalez Riga. According to this author these vertebrate remains were found in a tidal paleoenvironment, resulting from transportation, mixing and deposition of continental remains mixed with those from near costal environments. Among the turtles recovered in this locality only chelids and meiolaniforms were recognized. Previously to these findings Jose F. Bonaparte recovered in 1990 a large turtle from the same locality and horizon. This turtle is represented by an almost complete specimen that is housed in the Museo Argentino de Ciencias Naturales "Bernardino Rivadavia" (MACN).

Methods. Remains of basicranium (basioccipital and basisphenoid), fragments of both quadrates, left opisthotic, a lower jaw, cervical vertebrae, one caudal vertebra, appendicular skeleton, a partial carapace and one almost complete plastron are well preserved in MACN Pv M2. MACN Pv M2 represents one of the most complete Cretaceous short-necked chelid known from South America. In order to explore the phylogenetic relationships of MACN Pv M2, this specimen was included in a data matrix built up by 48 characters and 17 taxa. One fragmentary costal plate from the carapace was sampled for histological analysis. The bone microstructure of the thin sections was studied under light microscopy using normal and polarized lights.

Results. The preliminary phylogenetic analysis suggests that MACN Pv M2 is nested in a clade also including *Phrynops hilarii* + *Mesoclemmys nasuta* + long-necked chelids. The

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pelvic girdle attached by suture to the carapace and plastron in MACN Pv M2 and the synapomorphic characters such as the pattern of the cervical vertebrae centra, splenial bone in the lower jaw, ilium extending over the eight costal and anterior margin of the suprapygal bones allow us to assign this specimen to Pleurodira Chelidae. The microanatomy of MACN Pv M2 shows a diploe structure as in other turtles. The internal cortex is equal or slowly thinner than the external one, and the cancellous bone occupy the main proportion (50-60%). The external cortex is composed of structural fibre bundles that extend parallel to the external surface and orient longitudinally and transversally to the progression of the elements. The cancellous bone is mostly well developed. The internal cortex consists of parallel-fibred bone that locally can grade into lamellar bone.

Discussion. The unique combination of plesiomorphies (such as lateral mesoplastra, area articularis mandibularis concave, a short midline epiplastral suture, an anterior peripherals bones shorter than posterior ones) and autapomorphies (such as both rami of the lower jaw fused, extremely wide anterior plastral lobe, and a slightly epiplastral notch) recovered in this phylogenetic analysis allow to assigned MACN Pv M2 as a new species of short-necked chelid taxa. The histology of MACN Pv M2 shows features that suggest adaptation to the aquatic lifestyle (i.e., well vascularized external cortex, the vascularization of the internal cortex composed of scattered vascular canals and primary osteons of longitudinally orientation).

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