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A NEW MIOCENE TURTLE FROM COLOMBIA SHEDS LIGHT ON THE EVOLUTIONARY HISTORY OF THE EXTANT GENUS *MESOCLEMMYS* GRAY, 1873

EDWIN-ALBERTO CADENA,¹ ANDRÉS VANEGAS,² CARLOS JARAMILLO,^{3,4,5} JOHN M. COTTLE,⁶ and THOMAS A. JOHNSON⁶

¹Grupo Investigación en Paleontología Neotropical Tradicional y Molecular (PaleoNeo), Facultad de Ciencias Naturales y Matemáticas, Universidad del Rosario, Bogotá, Colombia, edwin.cadena@urosario.edu.co;

²Fundación Vigías del Patrimonio Paleontológico La Tatacoa, La Victoria, Huila, Colombia;

³Center for Tropical Paleocology and Archeology, Smithsonian Tropical Research Institute, Panama City, Panama;

⁴Equipe de Paléontologie, Institut des Sciences de l'Évolution de Montpellier, Université de Montpellier, Montpellier, France;

⁵Institut des Sciences de l'Évolution de Montpellier, Université de Montpellier, Montpellier, France;

⁶Department of Earth Science, University of California Santa Barbara, Santa Barbara, California, U.S.A

ABSTRACT—*Mesoclemmys* is the most diverse extant genus of South American pleurodires or side-necked turtles, with at least 10 species inhabiting fluvial to littoral environments. Despite this high extant diversity and extensive geographic distribution, the evolutionary history and fossil record of this genus are completely unknown. Here, we describe the first fossil record of this genus, which supports a previous molecular-based hypothesis that indicates a minimum split time of 13.5 Ma between this and other genera of South American chelids. *Mesoclemmys vanegasorum*, sp. nov., is represented by a nearly complete shell (carapace and plastron) and some postcranial bones found in the middle Miocene (13.6 ± 0.2 Ma), La Victoria Formation, Tatacoa Desert, Colombia, increasing the turtle paleodiversity of La Venta Fauna. It differs from all extant species of *Mesoclemmys* by vertebral scute 1 reaching the sutural boundary between peripherals 1 and 2; shorter cervical and marginal scutes 1 to 3; pleurals 1 very advanced over the peripherals; pygal bone with a posteromedial shallow notch; vertebral 5 covering half of the pygal bone; small extragulars reaching only half of the epiplastral length; and a fine microvermiculation of the shell. Our phylogenetic results show a close relationship between *M. vanegasorum*, sp. nov., and the extant *M. hoguei*. The overall morphology and size of *Mesoclemmys* genus have remained relatively constant for at least the last 13.6 million years. However, its geographic distribution has decreased drastically in northwestern South America, being restricted today to the lower region of the Magdalena River Basin.

<http://zoobank.org/urn:lsid:zoobank.org:pub:08642143-DE05-4974-9563-1BF9CB6BF5EB>

SUPPLEMENTAL DATA—Supplemental materials are available for this article for free at www.tandfonline.com/UJVP

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INTRODUCTION

Pleurodires or side-necked turtles exhibit a long history and high diversity in South America since at least the Early Cretaceous (de la Fuente et al., 2014; Romano et al., 2014; Ferreira et al., 2018). They are represented by two extant families: Podocnemididae and Chelidae, the last having at least 25 extant species, including *Mesoclemmys* Gray, 1873, the most diverse genus of extant South American pleurodires, with 10 species (Rhodin et al., 2017; Vlachos et al., 2018). All extant South American chelid turtles are found east of the Andes except for *M. dahli* (Zangerl and Medem, 1958), which is restricted to the northern region of Colombia (Forero-Medina et al., 2013; Montes-Correa et al., 2014), and *M. zuliae* in the Maracaibo Basin of eastern Venezuela (Rhodin et al., 2017).

Despite the abundant diversity of extant South American chelids, their fossil record in the Neotropics is restricted to the genus *Chelus* found at several Miocene localities in Colombia,

Venezuela, Peru, and Brazil (Ferreira et al., 2016; Maniel and de la Fuente, 2016, and references therein). The poor fossil record of chelids of tropical South America (except for *Chelus*) hampers a full understanding of the topology and timing of its phylogenetic evolution. For example, a calibration point of 13.4 Ma has been used by several authors for the split among *Chelus*, *Phrypnos*, and *Mesoclemmys* (Joyce et al., 2013; Pereira et al., 2017); this hypothesis can only be tested with the fossil record of *Phrypnos* and/or *Mesoclemmys*.

Here, we describe the first fossil record of *Mesoclemmys*, represented by a nearly complete shell (carapace and plastron) and some postcranial bones found in the middle Miocene, La Victoria Formation, La Venta Fauna, Tatacoa Desert, Huila Department, Colombia (Fig. 1). We compare this fossil with other extant and extinct chelids and include it in a phylogenetic analysis using a modified version of the most recent character-taxon matrix for the clade (Orizabala et al., 2019). Finally, we discuss the implications of this fossil in understanding the evolutionary and geographic history of the extant *Mesoclemmys* genus and the freshwater turtle fauna of Colombia.

Institutional Abbreviations—ICN, Instituto de Ciencias Naturales, Universidad Nacional de Colombia, Bogotá, Colombia;

*Corresponding author.

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