



# Article

urn:lsid:zoobank.org:pub:AC004567-7D4D-4508-A082-AA2635A734C2

## Taxonomic validity of *Mesoclemmys heliostemma* (McCord, Joseph-Ouni & Lamar, 2001) (Testudines, Chelidae) inferred from morphological analysis

FLAVIO B. MOLINA<sup>1,2</sup>, FABIO A. MACHADO<sup>1,3</sup> & HUSSAM ZAHER<sup>1,4</sup>

<sup>1</sup>Museu de Zoologia, Universidade de São Paulo, Avenida Nazaré 481, Ipiranga, São Paulo, 04263-000, SP, Brazil.

<sup>2</sup>Universidade de Santo Amaro, Campus I, Rua Prof. Enéas de Siqueira Neto, 340, Cidade Dutra, São Paulo, 04829-300, SP, Brazil.  
E-mail: fbmolina@uol.com.br

<sup>3</sup>Programa de Genética e Biologia Evolutiva, Universidade de São Paulo, Rua do Matão, trav.14, Cidade Universitária CP 11.461, CEP 05422-970, SP, Brazil. E-mail: macfabio@gmail.com

<sup>4</sup>Corresponding author. E-mail: hussam.zaher@gmail.com

### Abstract

*Mesoclemmys heliostemma* (Testudines: Chelidae) was described based on five vouchered specimens and nine live specimens from the western Amazon basin. Some authors questioned its status as a valid species, suggesting that it represents a junior synonym of *M. raniceps*. Here, we report on eight additional specimens from eastern Peru and northern Brazil, and provide descriptive statistics of morphological characters for hatchlings, juveniles, and adults of *M. heliostemma*, *M. raniceps*, and *M. gibba*. We also test for group differences through univariate and multivariate statistical analyses, and discuss some advantages of this methodology. Our data suggest that all three taxa are morphologically divergent, and that *M. heliostemma* is a valid species.

**Key words:** taxonomy, range extension, morphometrics

### Introduction

The genus *Mesoclemmys* (Testudines: Chelidae) includes ten species of freshwater side-necked turtles that are distributed from northern Colombia to northeastern Argentina (Bour & Zaher, 2005). Four species are present in the Amazonas River basin: *M. gibba* (Schweigger, 1812), *M. nasuta* (Schweigger, 1812), *M. raniceps* (Gray, 1855), and *M. heliostemma* (McCord, Joseph-Ouni and Lamar, 2001). These turtles are bottom dwellers that live preferentially in lentic waters, being found mainly in small forest streams, creeks, ponds, and muddy swamps (Medem, 1960; Dixon & Soini, 1977; Mittermeier *et al.*, 1978; Pritchard & Trebbau, 1984; Métrailler & Le Gratiet, 1996; Vogt *et al.*, 2009; Ferronato *et al.*, 2011). *Mesoclemmys heliostemma* seems to prefer water bodies on high, non-flooded forest areas (McCord *et al.*, 2001; Cisneros-Heredia, 2006). All four species are primarily nocturnal and carnivorous, usually eating fishes, tadpoles, and a large variety of invertebrate species like insect larvae and crustaceans (Mittermeier *et al.*, 1978; Pritchard & Trebbau, 1984; Métrailler & Le Gratiet, 1996; Rueda-Almonacid *et al.*, 2007). *Mesoclemmys raniceps* is a mollusk specialist, eating mainly on gastropods (Fachin-Teran *et al.*, 1995). Vegetal material seems to be occasionally ingested, at least by *M. gibba*, *M. nasuta*, and *M. raniceps* (Mittermeier *et al.*, 1978; Métrailler & Le Gratiet, 1996; Rueda-Almonacid *et al.*, 2007; Vogt *et al.*, 2009).

*Mesoclemmys heliostemma* was described in 2001, based on specimens from localities in northeastern Peru, eastern Ecuador and southern Venezuela (McCord *et al.* 2001). The species is sympatric with *M. gibba* and *M. raniceps* (McCord *et al.* 2001; Bour & Zaher 2005) and is morphologically similar to the latter (McCord *et al.* 2001). According to McCord *et al.* (2001), *M. heliostemma* can be distinguished from *M. raniceps* by possessing a narrower head (head width represents 25% of carapace length in juveniles), a broader parietal roof (parietal width represents 15% of head width in juveniles, presumably 10-12% in adults), a more substantial parieto-squamosal arch, an intergular scute narrower than the gular scutes, a flatter shell, a more rounded carapace (maximum width at marginal 7<sup>th</sup>), and the 11<sup>th</sup> pair of marginal scutes equal to or wider than the supra-caudal pair. These authors also