Geometric Morphometric Analysis of the skull of *Podocnemis* spp. (Pleurodira, Podocnemididae) and its implications on the taxonomic status of *Podocnemis bassleri* Williams, 1956

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Background. *Podocnemis bassleri* Williams, 1956 is the oldest definite record for *Podocnemis*, dating back to the Miocene of South America. However, the diagnosis of *P. ba.* is fragile, as assumed by Williams himself. Here we evaluated the hypothesis of *P. ba.* as a synonym of *P. expansa* by exploring the shape variation of the skull among *Podocnemis* spp.

Methods. We collected 19 landmarks on the left side of the skull in ventral view from 33 *Podocnemis* spp. skulls. We included in the sample a new specimen of *P. ba.* from the Miocene of Acre, Brazil (MCT/RJ unnumbered) and the holotype (AMNH 1662) from the Miocene of Peru, along with: *P. erythrocephala* (n=3), *P. ex.* (n=9), *P. lewyana* (n=1), *P. sextuberculata* (n=9), *P. unifilis* (n=6), and *P. vogli* (n=3). The data was then Procrustes superimposed and a Relative Warps Analysis (RW) was performed to evaluate shape variation. Also, a multivariate regression of the Partial Warps (i.e.: the eigenvectors of the "bending energy" matrix) versus the log-transformed centroid size (the independent variable) was computed in order to evaluate the allometry in the data. All analyses were fulfilled using Rohlf's TPS softwares.

Results. The two first RWs accumulated ~52% of shape variation. The individual projection of the specimens in RW1 and RW2 showed a structure partially explained by a phylogenetic signal. *P. ex.* and *P. se.*, previously considered as sister-groups, were projected in the negative scores of RW1. Also, these two species were projected, respectively, in the positive and negative scores of the RW2. The two specimens of *P. ba.* were nested among *P. ex.* specimens. Furthermore, the multivariate regression revealed an effect of the size in the shape variation: larger skulls have wider maxillae and posterior region laterally extended.

Discussion. According to the literature, *P. ex.* and *P. ba.* are nearly indistinguishable (besides the larger size of the second), and Williams seems to have used the Miocene age of the second as a criterion for differentiating the two taxa. Indeed, one of the diagnostic features pointed out by Williams – slightly shorter relative distance from snout tip to posterior borders of the orbits – seems to be a taphonomic outcome. Moreover, the second diagnostic character – internal palatal processes of the maxillae abruptly dorsally projected – is extended anteroposteriorly in the MCT/RJ *P. ba.* specimen, as in all recent taxa. So, this character is polymorphic or also results of a taphonomic outcome. As consequence, *P. ba.* lacks a suitable diagnosis. Our preliminary results revealed little differences in shape of *P. ex.* and *P. ba.* and a clear allometric effect in the shape variation. In conclusion, it seems reasonable to suggest that *P. ba.* is a junior synonym of *P. ex.*, although we will wait to claim it after additional analyses.

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