



3D RECONSTRUCTION OF THE ELEMENTS OF THE PECTORAL GIRDLE AND THE ANTERIOR LIMBS OF *MONTEALTOSUCHUS ARRUDACAMPOSI*, A PEIROSOURIDAE FROM THE UPPER CRETACEOUS OF THE BAURU BASIN

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Fossil Crocodyliformes are well-represented in sedimentary deposits of Bauru Basin. *Montealtosuchus arrudacamposi*, a Peirosauridae from the Upper Cretaceous of the Bauru Basin, was found in rocks from the Turonian-Santonian age, Bauru Group, Adamantina Formation in the region of Monte Alto (S 21° 09' 53.9" W 48° 29' 54.0") (Carvalho et al., 2007). These specimens were preserved in a succession of thin to medium layers of loosely-cemented reddish sandstones. The strata overlaying this horizon are composed of fine sandstone with remains of tetrapods and bivalves. At the top of the sequence, there is a highly cemented conglomerate layer containing coprolites, as well as teeth and isolated bones of dinosaurs, chelonians, and squamata. The remains of *M. arrudacamposi* were found in association with fragments of another skull, and there are other several postcranial fragments of at least four other individuals that appear to belong to the same species. It corresponds to the skull, mandible, postcranial elements and dermal shield preserved practically in their original positions. The holotype of *M. arrudacamposi* was scanned at the Institute of Radiology, Faculty of Medicine, São Paulo USP, Brazil, using the Discovery CT750 HD CT Scanner. The CT images were segmented in InVesalius 3.0 software, developed at the Three-Dimensional Technologies Division, (Renato Archer Information Technology Center, city of Campinas, São Paulo- Brazil), and at the Brazilian Synchrotron Light Laboratory (LNLS), CNPEM (Campinas, São Paulo – Brazil), using the Avizo 9.0 program of the FEI Visualization Sciences Group, software that allows separation of the fossilized structures of the matrix using the contrast generated by their difference in density. A morphometric, morphofunctional and 3D reconstruction of the elements of the pectoral girdle and the anterior limbs of *M. arrudacamposi* were performed. For a better understanding of the most plausible pectoral girdle and anterior limb posture, the studied bones were virtually disarticulated and articulated on 3D reconstruction. The appendicular bony elements of *M. arrudacamposi* were separated and virtually aligned in a more plausible life-like position (Tavares et al., 2017). The 3D realignment of the bones, the pectoral girdle and anterior appendicular skeleton of *M. arrudacamposi*, showed that this crocodyliform had a more vertical position of its anterior limbs when compared with living species. The virtual articular adjustment between the coracoid, scapula and the positioning of the humerus next to the coracoid, also allowed the repositioning of the radius, ulna and elements of the front autopodium. The bony elements of the appendicular skeleton of *M. arrudacamposi* are arranged vertically below the articulations of the coracoid and scapula. The anatomical arrangement of long bones and autopodial elements indicate that *M. arrudacamposi* was a Crocodyliformes of terrestrial and predator habits (Tavares et al., 2017), erect in the gait, contrasting to the sprawling gait of living cocrodiles.

Carvalho, I.S., Vasconcellos, F.M., Tavares, S.A.S., 2007. *Montealtosuchus arrudacamposi*, a new peirosaurid crocodile (Mesoeucrocodylia) from the Late Cretaceous Adamantina Formation of Brazil. *Zootaxa* 1607, 35-46.

Tavares, S.A.S., Branco, F.R., Carvalho, I.S., Maldanis, L., 2017. The morphofunctional design of *Montealtosuchus arrudacamposi* (Crocodyliformes, Upper Cretaceous) of the Bauru Basin, Brazil. *Cretaceous Research* 2017, 64-76.