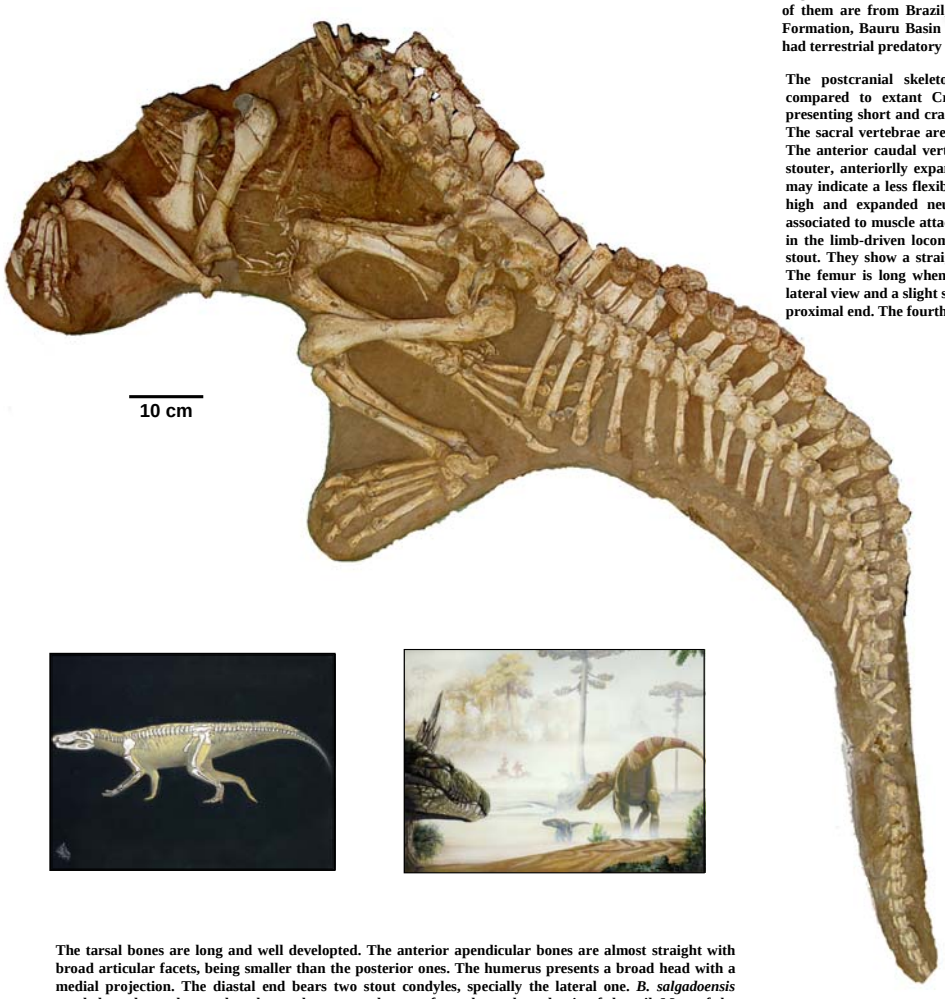
The locomotion pattern of *Baurusuchus salgadoensis* Carvalho, Nobre & Campos, 2005 and the distribution of Baurusuchidae in Gondwanaland

Felipe Mesquita de Vasconcellos, Thiago da Silva Marinho & Ismar de Souza Carvalho

Universidade Federal do Rio de Janeiro, Departamento de Geologia, CCMN/IGEO, Cidade Universitária – Ilha do Fundão, 21949-900. Rio de Janeiro, RJ - Brasil., felipe.crocodilo@ig.com.br , tsmarinho@gmail.com , ismar@geologia.ufrj.br

Baurusuchus salgadoensis **Carvalho, Nobre & Campos, 2005 is a ziphodont mesoeucrocodylian related to the Sebecosuchia. They are found in Late Cretaceous rocks of Argentina, Brazil and India. 5 species have been described so far (Turner & Calvo, 2005). 3 of them are from Brazil, especifically from São Paulo State, in outcrops of Adamantina Formation, Bauru Basin (Carvalho et al., 2005). Cranial features indicate that this species had terrestrial predatory habits.**

The postcranial skeleton of *B. salgadoensis* show distinctive characteristics when compared to extant Crocodylomorpha. The dorsal vertebrae are close articulated, presenting short and craniocaudally expanded neural spines, specially the posterior ones. The sacral vertebrae are robust and have the lateral processes highly fused to the ilium. The anterior caudal vertebrae are robust as the sacral ones but their neural spines are stouter, anteriorlly expanded and higher. The close articulation of the dorsal vertebrae may indicate a less flexible dorsal spine, ideal to limb-driven methods of locomotion. The high and expanded neural spines of the posterior dorsal and sacral vertebrae are associated to muscle attachment from the osteoderms and the pelvic musculature, all used in the limb-driven locomotion. The appendicular bones of *B. salgadoensis* are long and stout. They show a straight aspect of their diaphysis and very well-developed epiphysis. The femur is long when compared to extant crocodilians, showing a straight aspect in lateral view and a slight sigmoid aspect in frontal view. There is a small axial torsion at the proximal end. The fourth trochanter is pronouced and posteriorlly oriented



The tarsal bones are long and well developted. The anterior apendicular bones are almost straight with broad articular facets, being smaller than the posterior ones. The humerus presents a broad head with a medial projection. The diastal end bears two stout condyles, specially the lateral one. *B. salgadoensis* exoskeleton has only two dorsal osteoderm rows that run from the neck to the tip of the tail. Most of the osteoderms are wider than longer, with a round lateral portion that does not articulate to any flank osteoderm. The only morphological difference appears at the caudalmost portion of the tail, where the osteoderms are craniocaudally elongated. The medial portion has little variation along the scutes rows and may bear medial lamellar dorsoventral structures of articulation to the adjacent bony plate. The anterior articular facet is discrete and the osteoderms are not as imbricated as occur in other crocodyliforms and even may not be imbricated at all. The pelvic region osteoderms have the tallest keel of the row that runs from the anterior articular facet to posteriormost portion of the osteoderm.

B. salgadoensis **has a light exoskeleton, and then is less encumbranced by it and more agile. The imbrication of dorsal armor assists the limb-driven locomotion of many crocodyliforms by reducing the flexibility of the dorsal spine during the high-walk (Sennikov, 1987). Therefore the long and stout limb bones, overhanging crest of the illium and the light weighted armor, also allowed to *B. salgadoensis* having the limb-driven locomotion without this pattern of osteoderms.**

The femoral head possess a mesial projection that articulates itself to the illium, similar to those of Protosuchia and thecodont archosaurs as the Rauisuchia. The illium of *B. salgadoensis* presents a lateral and posteriorlly expanded postaccetabular crest, similar to those observed in Rauisuchia and Protosuchia, referred as overhanging ilium. This pattern of articulation is observed in the rauisuchian thecodonts and interpreted as a characteristic trait of those able erect-posture and limb-driven predators of Triassic environments (Bonaparte, 1984)