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## A new toothed pterosaur (Pterodactyloidea: Anhangueridae) from the Early Cretaceous Romualdo Formation, NE Brazil

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### Abstract

A new species of pterosaur, *Maaradactylus kellneri* gen. nov., sp. nov. (Archosauria: Pterosauria) from the Romualdo Formation (Aptian/Albian), is herein described. The specimen (MPSC R 2357) was found at Sítio São Gonçalo, Santana do Cariri city (State of Ceará, northeast Brazil) and consists of the skull, atlas and axis, and represents one of the largest skulls of the Anhangueridae from the Araripe Basin described. The autapomorphies of the new pterosaur include the following characters: a premaxillary sagittal crest that is relatively long and high, beginning at the anterior part of the skull (rostrum) and extending to the 22<sup>nd</sup> pair of alveoli, not covering the nasoantorbital fenestra or the choanae, and also the presence of 35 pairs of alveoli; smooth palatal ridge, which starts on the 5<sup>th</sup> pair of alveoli and ends on the 13<sup>th</sup> pair; palate is convex shaped in the anterior region; choanae not extending laterally; small and convex palatal elevation; the 5<sup>th</sup>, 6<sup>th</sup> and 7<sup>th</sup> alveoli smaller than the 4<sup>th</sup> and 8<sup>th</sup>; the alveoli decreasing in size from the 9<sup>th</sup> to the 12<sup>th</sup> and increasing from the 13<sup>th</sup> to 18<sup>th</sup>, and from the 18<sup>th</sup> to the 35<sup>th</sup> they are arranged in triplets. Furthermore, the lateral surface of the premaxillary crest shows grooves and tridimensional structures that may have housed blood vessels.

**Key words:** Pterosauria, Anhangueridae, Araripe Basin, Romualdo Formation, Brazil

### Introduction

Pterosaurs are a group of archosaurs well represented in the fossil record of the Araripe Basin (Kellner and Campos 2002). Since the first description of a pterosaur species from this deposit (Price 1971), several specimens have been collected in this region (e.g. Kellner and Tomida 2000; Kellner 2006; Kellner *et al.* 2013). There are currently 27 formally described species, showing a wide diversity of pterosaurs from this deposit (Campos and Kellner 1985; Witton *et al.* 2009; Eck *et al.* 2011); however, the validity and taxonomic assignment of some taxa is controversial (Fastnacht 2001; Veldmeijer 2003; Rodrigues and Kellner 2008; Martill and Unwin 2012). The major systematic problem within this fauna is the lack of consensus regarding which clades the individual taxa belong to. To date these pterosaurs have been attributed to Ornithocheiridae (de Buisonjé 1980), Anhangueridae (Campos and Kellner 1985), Criorhynchidae (Fastnacht 2001), Tapejaridae (Kellner 1989b) and Ctenochasmatoidea (Unwin 1995).

The Anhangueridae clade, though not restricted to Brazil, has its most significant findings recorded in Araripe Basin. This group is defined, according to Kellner (2003), as the immediate common ancestor of *Anhanguera* Campos and Kellner, 1985, and *Tropeognathus* Wellnhofer, 1987, and all its descendants. To date, Anhangueridae is comprised of seven genera: *Anhanguera*, *Tropeognathus*, *Coloborhynchus* Owen, 1874, *Liaoningopterus* Wang and Zhou, 2003, *Siroccopteryx* Mader and Kellner, 1999, *Uktenadactylus* Rodrigues and Kellner, 2008 and *Caulkicephalus* Steel, Martill, Unwin and Winch, 2005 (Kellner and Tomida 2000; Veldmeijer 2003; Rodrigues

relationships shows the importance of proper and thorough preparation of individuals prior to their study, and brings new understanding to the the Araripe Basin pterosaurs.

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