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A new titanosaur sauropod from the Late Cretaceous of Brazil

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Abstract

A new titanosaur dinosaur, *Brasilotitan nemophagus* **gen. et sp. nov.**, is described from the Adamantina Formation (Turonian-Santonian, Bauru Basin). The specimen consists of a dentary, cervical and sacral vertebrae, one ungual and remains of the pelvic region, that were collected near Presidente Prudente city, São Paulo State. It shows a mandible with an 'L' shaped morphology, with the symphyseal region of the dentary slightly twisted medially, a feature never recorded before in a titanosaur. *Brasilotitan nemophagus* can be further separated from other members of this clade by: (1) the dorsal portion of the dentary symphyseal contact is broader anteroposteriorly than the ventral part; (2) the ventral portion of the cervical centrum is arched dorsally; (3) the presence of an anteriorly directed accessory prezygapophyseal articulation surface on the cervical vertebrae; (4) the intraprezygapophyseal laminae of the cervical vertebrae are 'V' shaped in dorsal view; and other features. Although the phylogenetic position of *Brasilotitan nemophagus* is difficult to establish, the new species is neither a basal nor a derived member of the Titanosauria and, based on the lower jaw morphology, appears to be closely related to *Antarctosaurus wichmannianus* and *Bonitasaura salgadoi*. This discovery enriches the titanosaur diversity of Brazil and further provides new anatomical information on the lower jaws of those herbivorous dinosaurs.

Key words: Dinosauria, Titanosauria, *Brasilotitan*, Bauru Basin

Introduction

Except for one diplodocoid (Carvalho *et al*. 2003), all other named sauropod dinosaurs from Brazil belong to the clade Titanosauria, a rather diversified Cretaceous group of herbivorous sauropod dinosaurs that are mainly found in parts of Gondwana (González Riga *et al*. 2009; Bittencourt & Langer 2011). At present, eight named titanosaur species from Brazilian deposits are considered valid (Kellner & Campos 2000; Santucci & Arruda-Campos 2011; Mannion & Otero 2012). Besides the exceptional skull of *Tapuiasaurus macedoi* Zaer *et al*., 2011 and the partial upper jaw of *Maxakalisaurus topai* Kellner *et al*., 2006, all other taxa lack cranial elements.

Here we present the description of a new species, *Brasilotitan nemophagus* **gen. et sp. nov.**, which is based on an incomplete lower jaw and postcranial elements. The specimen was collected by one of us (WRN) in the year 2000 at the Raposo Tavares state road, near Presidente Prudente city, São Paulo State. At this region, the main stratigraphic unit is the Late Cretaceous Adamantina Formation whose age is disputed, being regarded as Turonian-Santonian (Dias Brito *et al*. 2001) or Campanian-Maastrichtian (Gobbo Rodrigues *et al*. 1999).

Outcrops at or close to the urban perimeter of Presidente Prudente have produced several fossils, including partially articulated axial skeletons of fishes (Brito & Nava 2008), crocodyliforms (Campos *et al*. 2011), turtles (Oliveira & Romano 2007) and one incomplete squamate (Nava & Martinelli 2011). This area also yielded the first

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