



## *Achillesaurus manazzonei*, a new alvarezsaurid theropod (Dinosauria) from the Late Cretaceous Bajo de la Carpa Formation, Río Negro Province, Argentina

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### Abstract

A new genus and species, *Achillesaurus manazzonei* gen. et sp. nov., of the enigmatic clade Alvarezsauridae (Theropoda, Coelurosauria), recovered from the Santonian Bajo de la Carpa Formation (Río Negro Province, Argentina), is here described. *A. manazzonei* is a relatively large alvarezsaurid different from *Alvarezsaurus calvoi* (from the same Age and Formation) in having a lateral fossa in the proximal caudal centra, a less developed supraacetabular crest, the brevis shelf not reaching the base of the ischial pedicel, and the lateral malleolus of the tibia at the same level of the medial one. *Achillesaurus* differs from *Patagonykus puertai*, from the Portezuelo Formation (Neuquén Province, Argentina), by the presence of an almost undeveloped supraacetabular crest of the ilium and the unfused condition of the astragalus and the calcaneum. The new species is excluded from the Asian Mononykinae due to the unreduced fibula distally and a non-arc-tometatarsalian pes. The autapomorphies of *Achillesaurus* are the presence of a biconcave caudal vertebra (possibly the fourth) with the cranial surface 30% larger in diameter than the caudal one. The inclusion of *Achillesaurus* in a phylogenetic framework resulted in an unresolved polytomy among the new taxon, *Alvarezsaurus*, and *Patagonykus* plus Mononykinae, the latter clade being weakly supported. The result here presented shows a basal stem radiation of South American alvarezsaurids. New material of the Patagonian alvarezsaurids is necessary to evaluate relevant traits to test further the phylogenetic relationships of the basal alvarezsaurids.

**Key words:** Dinosauria, Theropoda, Alvarezsauridae, Late Cretaceous, Argentina

### Introduction

In the last thirty years the discovery of theropod dinosaurs in South America, especially in Argentina, has increased considerably, not only providing new species, but also a better understanding of the evolution and paleobiogeography of the dinosaur faunas that inhabited Gondwana. In South America, and in Gondwana as a whole, the Cretaceous faunas were characterized by a great diversity of theropods, including medium-sized abelisauroid ceratosaurs (e.g. Bonaparte & Novas 1985; Bonaparte *et al.* 1990; Bonaparte 1991, 1996; Sampson *et al.* 1998; Coria *et al.* 2002; Kellner & Campos 2002), gigantic carcharodontosaurid and spinosaurid tetanurans (e.g. Coria & Salgado 1995; Kellner 1996; Sereno *et al.* 1996; Sues *et al.* 2002; Novas *et al.* 2005), and small-sized coelurosaurians (e.g. Bonaparte 1991; Novas 1996, 1997; Novas & Puerta 1997; Kellner 1999; Novas & Pol 2005; Makovicky *et al.* 2005). South American coelurosaurians are relatively poorly understood because most are based on partial elements.

Within Coelurosauria, Alvarezsauridae constitutes a bizarre Cretaceous clade of still uncertain affinities. This clade was erected by Bonaparte (1991) in order to include *Alvarezsaurus calvoi* Bonaparte, an enigmatic taxon from the Late Cretaceous of Patagonia, Argentina. Subsequent discoveries in Mongolia (Perle *et al.*