



An abelisauroid dinosaur with a non-atrophied manus from the Late Cretaceous Pari Aike Formation of southern Patagonia

MARTÍN D. EZCURRA^{1*}, FEDERICO L. AGNOLIN^{1,2} & FERNANDO E. NOVAS^{1,3}

¹Laboratorio de Anatomía Comparada y Evolución de los Vertebrados, Museo Argentino de Ciencias Naturales "Bernardino Rivadavia", Av. Ángel Gallardo 470 (C1405DJR), Buenos Aires, Argentina. E-mail: martinezcurra@yahoo.com.ar

²Fundación de Historia Natural "Félix de Azara", Universidad Maimónides, V. Virasoro 732 (1405), Buenos Aires, Argentina. E-mail: fedeagnolin@yahoo.com.ar

³CONICET, Argentina. E-mail: fernovas@yahoo.com.ar

Abstract

We describe the new basal abelisauroid dinosaur *Austrocheirus isasii* gen. et sp. nov. from the Late Cretaceous Pari Aike Formation of southwestern Patagonia, Argentina. The preserved remains include manual bones, a distal tibia, and some pedal and axial elements. *Austrocheirus* is differentiated from other basal theropods by the presence of metacarpal III with a dorsoventrally compressed shaft and posteriorly displaced collateral tendon fossae located at the same level of the proximal end of distal condyles, and pedal phalanges with a conspicuous longitudinal crest delimitating the dorsal margin of the distal collateral tendon fossae. A cladistic analysis recovered the new species as more derived than *Ceratosaurus* and *Berberosaurus*, but within a polytomy at the base of Abelisauroida, an assignment supported by two abelisauroid synapomorphies: distal end of tibia with a planar vertical scar for the reception of the ascending process of the astragalus that occupies most of its anterior surface and is medially bounded by the longitudinally oriented facet; and scar for the reception of the ascending process with a median vertical ridge, which imbeds into a crescentic vertical groove on the posterior surface of the ascending process of the astragalus forming an interlocking tibiotarsal articulation. Furthermore, *Austrocheirus* represents the first known medium-sized Late Cretaceous abelisauroid bearing non-atrophied hands. The evidence provided here suggests that the strong reduction of the forelimb recorded in derived abelisauroids is not directly correlated with their increased body-size, but it seems to be an evolutionary event exclusive to this lineage within Ceratosauria.

Key words: Dinosauria, Theropoda, Abelisauroida, Late Cretaceous, Pari Aike Formation, Argentina

Introduction

Prior to the last decade, the South American Cretaceous theropod record was characterized by a high frequency of discoveries of ceratosaurians (Bonaparte & Powell 1980; Bonaparte 1985, 1991; Bonaparte & Novas 1985; Martínez *et al.* 1986; Coria & Salgado 2000; Kellner & Campos 2002; Coria *et al.* 2002; Calvo *et al.* 2004; Rauhut 2004; Canale *et al.* 2009). However, in recent years new discoveries from Cretaceous outcrops of the South American continent have included new species of different group of tetanurans (Coria & Salgado 1995; Martill *et al.* 1996; Novas *et al.* 2005a; Coria & Currie 2006). In particular, the coelurosaurian record has been remarkably enlarged by small to large-sized taxa, including compsognathids (Naish *et al.* 2004), alvarezsaurids (Bonaparte 1991; Novas 1997a; Martinelli & Vera 2007), and dromaeosaurids (Novas & Puerta 1997; Makovicky *et al.* 2005; Novas & Pol 2005; Novas *et al.* 2009).

The discovery of a fragmentary medium-sized abelisauroid from southwest Patagonia helps to enlarge this list. This new specimen was collected on March 17th 2002 at the Hoyada Arroyo Seco locality, outcrops belonging to the Late Cretaceous Pari Aike Formation, Santa Cruz Province, Argentina (Ambrosio 2003; Kraemer & Riccardi 1997; Novas *et al.* 2004) (Fig. 1). The tetrapod fauna recovered from this Maastrichtian unit also includes the basal ornithomimid *Talenkauen santacruzensis* Novas, Cambiaso & Ambrosio, 2004, the