New abelisaurid remains from the Anacleto Formation (Upper Cretaceous), Patagonia, Argentina

Federico A. Gianechni a,*, Sebastián Apesteguía b, Walter Landini c, Franco Finotti d, Rubén Juárez Valieri e, Fabiana Zandonai d

a CONICET – Área de Zoología, Departamento de Bioquímica y Ciencias Biológicas, Facultad de Química, Bioquímica y Farmacia, Universidad Nacional de San Luis, Chacabuco 917, 5700, San Luis, Argentina
b CONICET – Fundación de Historia Natural Félix de Azara, CEBBAD, Universidad Maimonídes, Hidalgo 775, 1405, Buenos Aires, Argentina
c Dipartimento di Scienze della Terra, Università di Pisa, Vía S. Maria 53, 56126, Pisa, Italy
d Fondazione Museo Civico di Rovereto, Borgo Santa Caterina 41, 38068, Rovereto, TN, Italy
e Secretaría de Cultura de la Provincia de Río Negro, Julio A. Roca 267, 8500, Viedma, Río Negro, Argentina

Article history:
Received 29 August 2014
Accepted in revised form 29 November 2014
Available online 18 December 2014

Keywords:
Abelisauridae
Sauropoda
Anacleto Formation
Upper Cretaceous
Patagonia

Abstract

New theropod remains with abelisaurid affinities from the Upper Cretaceous (Anacleto Formation, Lower Campanian), NW Patagonia, Argentina, are here described. The specimen (MPCN-PV 69) consists of a partial premaxilla, fragmentary vertebrae, proximal portion of both humeri, distal portion of the pubis, and an incomplete pedal ungual. Characters linking with Abelisauridae are a premaxilla with a subquadrangular body, externally ornamented, and paradeltal plates with a striated surface; and humerus with bulbous proximal head, conical internal tuberosity, and reduced greater tubercle. The humerus is similar to those of Carnotaurus and Aucasaurus, due to the presence of a bulbous head and a discontinuity between the head and the internal tuberosity, but also differs from both taxa in the more distal location of the greater tubercle with respect to the internal tuberosity. Aucasaurus also comes from Anacleto Formation, but differences in the humeri suggest that MPCN-PV 69 is a different taxon. The phylogenetic analysis performed supports the affiliation to Abelisauridae, but fails to determine a more precise relationship with others abelisaurids. However, a majority rule consensus of the analysis shows a position within Brachyrostra. Despite being fragmentary, MPCN-PV 69 probably represents a new abelisaurid from the Anacleto Formation, thus increasing the knowledge and diversity of Late Cretaceous South American abelisaurids.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

The deposits of the Anacleto Formation (Campanian), in Patagonia, are renowned for their rich content of fossil continental tetrapods, standing out the record of an abundant dinosaur fauna. Sauropods are the most diverse dinosaurs in this unit, which are represented by Antarctosaurus wichi manicans (von Huene, 1929), Neuquensaurus australis (Lydekker, 1893; Powell, 1986; Salgado et al., 2005), Barrosaurus casamiquelai (Salgado and Coria, 2009), Rinconsaurus caudamirus (Calvo and González Riga, 2003), Overosaurus paradoxorum (Coria et al., 2013), among others. In sedimentary rocks of this formation were also found the extensive nesting sites of sauropods from Auca Mahuevo, together with many eggs with embryonic remains, some of them with casts of the skin (Chiappe et al., 1998, 2000, 2001, 2004; Garrido et al., 2001; Chiappe and Coria, 2004). Ornithischians are represented so far by the ornithopod Gasparinisaurus cincosaltensis (Coria and Salgado, 1996). On the other hand, unlike many sauropods found in this formation, the record of theropods is scarcer, and only includes the neovenatorid megaraptoran Aerosteon riocoloradensis (Sereno et al., 2008) and the abelisaurid Aucasaurus garridoi (Coria et al., 2002). Despite the well-known Abelisaurus comunahuensis (Bonaparte and Novas, 1985) has been considered as belonging to the Anacleto Formation after the inclusion of all dinosaur bearing deposits of the Lago Pellegrini to that unit, it is locally known that the specimen actually comes from the Allen Formation at the Sr. Fernández field, close to Salitral Moreno, Río Negro Province (F. Fernández, pers.
2. Systematic paleontology

Theropoda Marsh, 1881

Neotheropoda Bakker, 1986

Ceratosaurus Marsh, 1884
Abelisauridae Bonaparte, 1991
Abelisauria Bonaparte and Novas, 1985
Genus et sp. indet.

3. Material

The specimen MPCI-PV 69 (Fig. 1) consists on a small to mid-sized theropod skeleton composed by a partial premaxilla, three probable dorsal vertebrae, fused sacral vertebrae, the proximal half of both left and right humeri, the distal portion of the pubis, and an incomplete pedal ungual phalanx, plus some indeterminate fragments. Due to the grade of fusion of the neural arches to the centra, the specimen corresponds probably to an adult or at least to a sub-adult. The total length of the skeleton is difficult to specify because it is highly fragmented, but is estimated to be between 3 and 5 m long.

Most of the material was found on surface in a single 4 m² area at the bottom of a creek along three different years in which the specimen bones were subsequently added by weathering of the origin site. The premaxilla, however, comes from several meters toward the top of the hill, but we consider it as belonging to the same specimen since it was found in the same erosive line and further the preservation is identical to the other bones. No systematic excavation was made in the place and the site of origin was not discovered. Whereas only this area provided theropod remains, the whole fossiliferous area provided the remains of numerous adult and juvenile specimens of titanosaurid sauropods that were not studied yet (Apesteguía et al., 2012).

4. Locality and horizon

Verdecchia family field is located 20 km SW from Fisque Menuco (General Roca), Río Negro Province, Argentina (Fig. 1A). The outcrop, found and described by Héctor Leanza in the Geologic Chart General Roca (Hugo and Leanza, 1999), represents a limited exposure with amphitheater structure where outcrops the Anacleto Formation (Río Colorado Subgroup) considered as lower Cretaceous, Upper Cretaceous (Dingus et al., 2000; Leanza et al., 2004; Garrido, 2010).

The Anacleto Formation is composed by a sequence of continental deposits, mainly sandstones, claystones and concretionary limestones (for more detailed geological data see Supplementary Information). The exposed level within this geological unit is not well determined, but was suggested as corresponding to its basal levels (H. Leanza, pers. comm.). The presence of fossil vertebrates in the area was noticed by C. Hugo and H. Leanza during the geological prospection.

The site presents a rich bonebed belonging probably to cf. Laplatasaurus araukanicus (Huene, 1929) or Bonitasaura salgadoi (Apesteguía, 2004). Turtle shells and a dipnoan tooth plate were also found in the area. The theropod material here studied was found by Mr. Raúl Ortiz in the context of a fieldtrip lead by one of the authors (S. A.) in coordination with the Group Pangea. All the material is housed in the MPCI, at General Roca, Río Negro.

5. Results

5.1. Description

5.1.1. Premaxilla

The only cranial material recovered belongs to a fragmentary premaxilla, with four teeth preserved still inserted in the corresponding alveoli (Fig. 2). The preserved portion is approximately