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Cueva del Milodón. The hunting grounds of the Patagonian panther

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ABSTRACT

This paper presents information derived from the taphonomic reevaluation of the Hauthal collection from Cueva del Milodón, Última Esperanza, Chile. This is a bone assemblage recovered in 1899 and 1900 at that cave and stored at the Museo de La Plata, Argentina. *Mylodon darwini*, *Hippidion saldiasi*, *Panthera onca mesembrina* and Camelidae are among the most important extinct animals represented at the site. These materials were studied and analyzed several times between the end of the 19th and beginning of the 20th Centuries. However, a detailed study with a taphonomic perspective such as the one presented here was lacking. Contrary to most previous evaluations, this analysis shows that an archaeological component can be defended at the end of the Pleistocene on the basis of the presence of cut marks on *Hippidion* bones. However, Lehmann-Nitsche excellent description of damages recorded on the ground sloth bones, that he attributed to humans, could not be confirmed. Instead, those damages are here interpreted as large carnivore tooth marks. They are concentrated on ground sloth remains and are attributed to *Panthera onca mesembrina*. It is here suggested that panthers used the cave and surroundings to prey on ground sloths. The study of the marks and their distribution, especially on ground sloth skulls, indicates the use of a hunting strategy which was similar to that used by jaguars (*Panthera onca*) when hunting large prey.

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1. Introduction

Cueva del Milodón is located at Cerro Benítez (51° 33′ 54″; 72° 37′ 13″), Última Esperanza, Chile (Fig. 1). It is a large cave ca. 180 m long, 150 m width and 30 m high formed on the conglomerates of the Cerro Toro Formation (Upper Cretaceous) (Wellman, 1972) (Fig. 2). Its wide mouth is exposed to the West. It is world famous due to the exceptional preservation of Late Pleistocene remains, including faeces and soft tissues (Emperaire and Laming, 1954; Bird, 1988; Barnosky and Lindsey, 2010; Borrero and Martin, 2012a), an unusual circumstance (Neustroev, 2012; Kirillova et al., 2015).

The bone assemblages discovered at the cave were discussed for more than 100 years. Most of these studies were descriptive or taxonomic. Even when there were relevant taphonomic observations in some of these studies, particularly by Nordenskjöld and Lehmann-Nitsche, in depth taphonomic studies were lacking (Borrero and Martin, 2012a; Martin, 2013). A taphonomic study of the *Mylodon* bone assemblages recovered by Hauthal in 1899 and 1900 is presented here. Only passing reference will be made to other species recorded in these bone assemblages, with the exception of carnivore bones.

This study complements other recent analyses made with these materials, such as paleoecology (Prevosti and Martin, 2013), research history (Borrero and Martin, 2012a) or recent excavations at the cave (Borrero et al., 2015).

2. Antecedents

A long series of studies described the bone assemblages, their chronology and sedimentological context (Hauthal, 1899; Lehmann-Nitsche, 1899, 1904; Moreno, 1899; Smith-Woodward, 1899, 1900; Roth, 1899, 1904; Emperaire and Laming, 1954; Saxon, 1976; Borrero, 1986; Borrero et al., 1991; Nordenskjöld, 1996 [1900]; Favier Dubois and Borrero, 1997). A relatively continuous distribution of the radiocarbon dates on mammal remains is recorded at the cave (Borrero, 1986, 1999; Tonni et al., 2003; Barnosky and Lindsey, 2010). The bone accumulation occurred immediately after the retreat of the Late Pleistocene glaciers, mainly between 15,000 and 10,000 BP.

The cave was discovered in 1895, and a large piece of ground sloth skin was found on the surface (Martinic, 1996). Nordenskjöld was the first to excavate the cave in March 1899. After visiting Nordenskjöld's excavation, Hauthal expediently excavated a long but shallow trench in April 24–29, 1899 (Fig. 3). A second campaign

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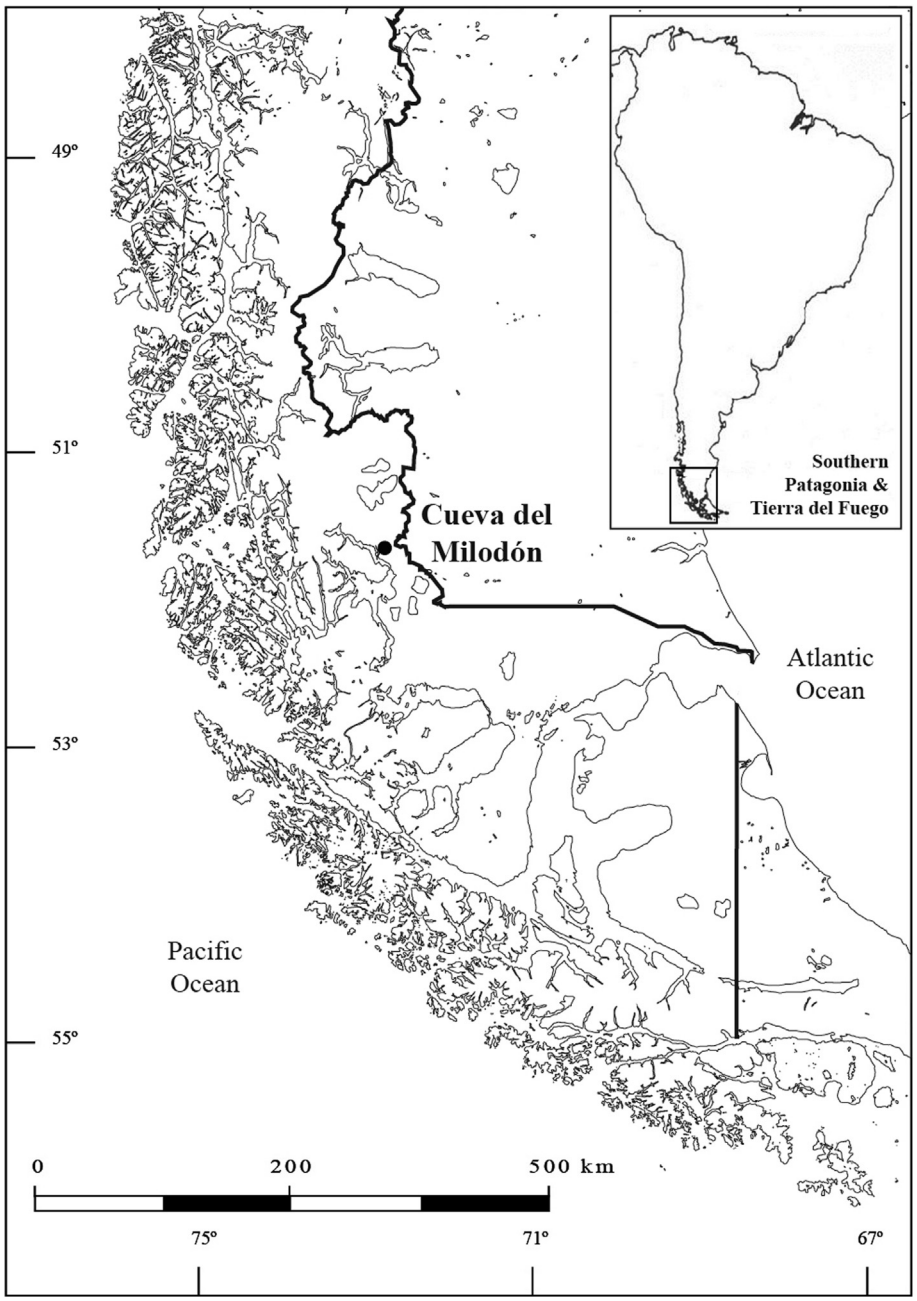

Fig. 1. Map.

by Hauthal took place at an unspecified period in 1900. He found a 1.20 m thick accumulation of ground sloth dung protected by the boulders hill (Hauthal, 1899: 414), and thought this dung accumulated in a corral for semi-domesticated ground sloths. Many years later Esteban (1996) determined those remains as *Mylodon darwini*, but at the beginning of the 20th Century the team from La Plata named it *Grypotherium domesticum* (Roth, 1899, 1904; Lehmann-Nitsche, 1899, 1904). During his excavation Hauthal found another piece of ground sloth skin, which he considered artificially cut. The stratigraphic provenience of the bone assemblage from the Hauthal collection was strictly from above the skin. Hauthal recorded the existence of a deeper dung deposit below the skin, but he did not excavate it.

More recently, two *Mylodon* samples from the collection were dated, 10,812 ± 325 and 10,377 ± 481 BP (Tonni et al., 2003) and a horse sample in 11,480 ± 60 BP (Alberdi and Prado, 2004). More than 40 dates available today, ranging approximately between 13,900 and 10,000 BP suggest that Hauthal's work was concentrated in the upper layers of the cave.

In this paper we present a taphonomic discussion focused on the ground sloth remains. This is not only the most abundant taxon, but also have paleobiological implications for the predator–prey relationships at the end of the Pleistocene. On the other hand, members of the La Plata team considered that ground sloths were exploited by humans (Lehmann-Nitsche, 1899, 1904). Our analysis points toward another predator – a carnivoran-as the agent behind those damages.

The materials of the Hauthal collection recovered in 1899 and 1900 are stored at the Vertebrate Paleontology section of the Museo de La Plata, Argentina. Some of these specimens were transported

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