

NOTA PALEONTOLÓGICA

A first record of the Pleistocene saber-toothed cat *Smilodon populator* Lund, 1842 (Carnivora: Felidae: Machairodontinae) from Venezuela



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Introduction

The first record of *Smilodon* Lund, 1842, was made based on a material found in Late Pleistocene deposits in caves near Lagoa Santa in eastern Brazil. Berta (1987) recognized two species of *Smilodon*, the small, slender *S. gracilis* (Cope, 1880) from Late Pliocene-Middle Pleistocene localities in North America and the larger, more robust, *S. populator* Lund, 1842 from Middle-Late Pleistocene localities in North and South America (Berta, 1987). In South America *S. populator* has been found in Ecuador, Peru, Bolivia, Brazil and Argentina (Berta, 1985), but has not been previously reported from Venezuela (Ochsenius, 1980). Here I report the first record of saber-toothed cat *S. populator* Lund, 1842 from Venezuela, found in two localities, Inciarte Tar Pits in Zulia State, and Zumbador Cave in Falcon State (figure 1).

As a large predator, the preferred habitat of *Smilodon* has been interpreted as areas between savannas and wooded areas with substantial brushy undergrowth that could be used as den sites (Shaw, 2001; Webb and Rancy, 1996).

Systematic paleontology

CANIVORA Bowdich, 1821

FELIFORMIA Kretzoi, 1945

FELIDAE Gray, 1821

MACHAIRODONTINAE Gill, 1872

SMILODONTINI Kurtén, 1963

Genus *Smilodon* Lund, 1842

Smilodon populator Lund, 1842

Figures 2-3

Material and methods. MBLUZ-P-1629 (Museo de Biología de la Universidad del Zulia, Sección de Paleontología), a right fourth lower premolar (figures 2.C, D) and MBLUZ-P-1630, a right first lower molar (figures 2.A, B), both coming from Inciarte Tar Pits locality. MBLUZ-P-5111, right metacarpal II (figure 3); and MBLUZ-P-5112, right upper canine. Both coming from Zumbador Cave.

Data on measurements for *S. populator* are from Kurtén and Wederlin (1990), and for *S. gracilis* from Berta (1987). The measurements were taken with a millimeter caliper following Berta's (1987) nomenclature for tooth morphology, and Kurtén and Wederlin (1990) for the metacarpal.

Geographical provenance. The Inciarte Tar Pits (10° 47' 42,6'' Lat. N - 72° 14' 20,8'' Long. W) is located in the Sierra de Perijá foothills near the Cachirí river, northwest of the La Paz Oil Beds, Zulia State. Zumbador Cave (10° 51' 26'' Lat. N, 68° 36' 41'' Long. W) (Fa. 116) is located in Yumare area, 15.5 Km. south-southwest from Yaracal, cerro Misión, Falcon State (figure 1).

Description. The P₄ (MBLUZ-P-1630) consists of a large principle cusp flanked by subequal cusplets. The anterior cusplet is smaller than posterior. The principle cusp and both the anterior and posterior cusplets are medially oriented. The posterior cingulum is less pronounced than in *S. gracilis*. Measurements of MBLUZ-P-1630 fall into the upper size range of *S. populator* and it is much larger than *S. gracilis* (table 1).

In the M₁ (MBLUZ-P-1629) the protoconid blade is longer and taller than the paraconid blade. There is a pronounced shearing surface present on the labial surface of both the paraconid and protoconid blades. A small talonid is developed on the M₁ composed of a smaller entoconid, hypoconid and metaconid. As with the P₄ (MBLUZ-P-1629) its measurements are in the upper limit of *S. populator* and are greater than *S. gracilis* (table 1).

The anterior border of the fragment of the upper canine (MBLUZ-P-5112) has the fine serrations typical of many members of the Machairodontidae. These are visible under magnification. Enough of the fragment is preserved to indicate a mediolateral compression of the tooth and a gentle anteroposterior curvature.

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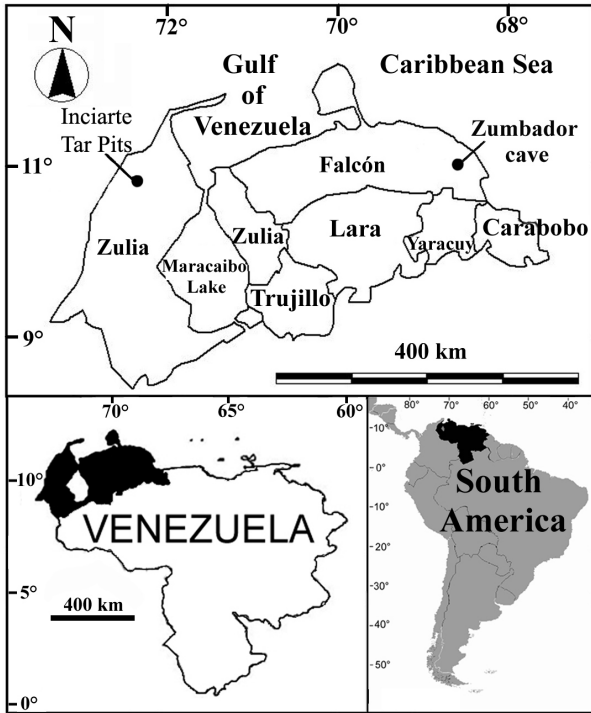


Figure 1. Location map showing Inciarte Tar Pits and Zumbador Cave localities / mapa de ubicación de los pozos de asfalto de Inciarte y la cueva del Zumbador.

In the metacarpal II (MBLUZ-P-5111), the proximal articular surface for the trapezoid lacks the strongly triangular shape seen in true cats. In anterior view, the oblique groove for the radial artery is

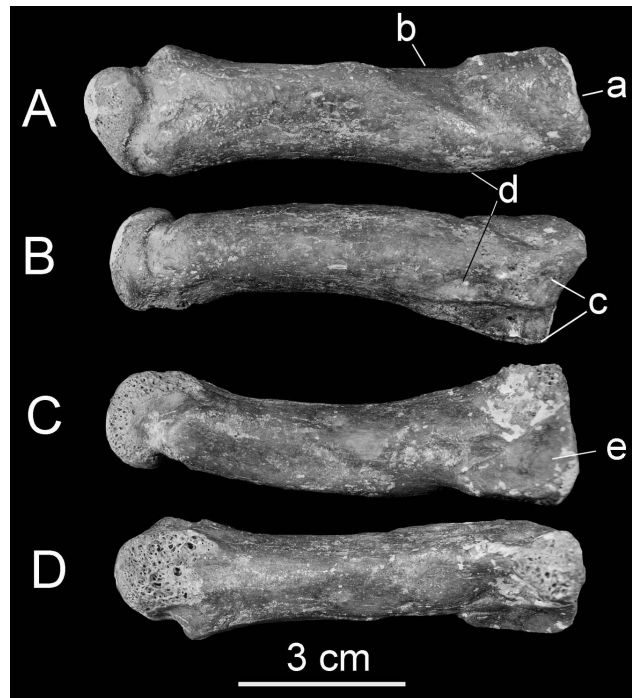


Figure 3. *Smilodon populator*, right metacarpal II (MBLUZ-P-5111); A, dorsal; B, medial; C, lateral and D, ventral views; a, articulation for trapezoid; b, radial artery; c, articulation for trapezium; d, insertion of extensor carpi radialis muscle; e, articulation for third metacarpal / *Smilodon populator*, II metacarpal derecho (MBLUZ-P-5111); A, vista dorsal; B, vista medial; C, vista lateral y D, vista ventral; a, articulación para trapezoide; b, arteria radial; c, articulación para trapezium; d, área de inserción del músculo extensor carpi radialis; e, articulación para III metacarpal.

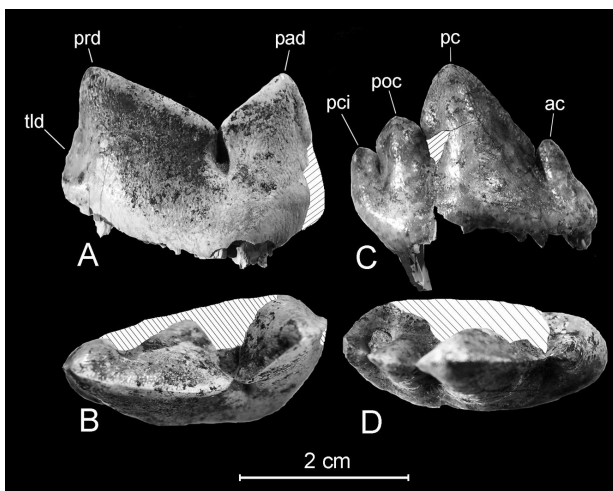


Figure 2. *Smilodon populator* Lund, 1842, right first lower molar (MBLUZ-P-1629); A, lateral; B, occlusal views. Right fourth lower premolar (MBLUZ-P-1630); C, lateral; D, occlusal views. tld=talonid; prd=protoconid; pad=paraconid; pci=posterior cingulum; poc=posterior cusplet; pc=principal cusp; ac=anterior cusplet / *Smilodon populator* Lund, 1842, primer molar inferior derecho (MBLUZ-P-1629); A, vista lateral; B, vista oclusal. P₄ cuarto premolar inferior derecho (MBLUZ-P-1630); C, vista lateral; D, vista oclusal. tld=talonido; prd=protoconido; pad=paraconido; pci=cingulo posterior; poc=cúspide posterior; pc=cúspide principal; ac=cúspide anterior.

prominent. Medially, the swelling for the insertion of the tendon of the extensor carpi radialis muscle, which functions to extend and abduct the forepaw, is more medially pronounced than in true cats. In medial view, the facet for the trapezium is elongated proximodistally. The shape of the metacarpal facet is broad and elongated proximodistally, as is characteristic of the genus. A facet for the magnum is lacking.

Greatest length and shaft width are in the upper size range of *S. populator*, but the distal width falls into the lower limits of *S. populator* and upper limits of *S. gracilis* (table 2).

Discussion

At present, there are two alternative hypotheses about *Smilodon* taxonomy. Berta (1987) proposed that Late Pleistocene sabertooth cats are a monospecific taxa (*S. populator*) that include as junior synonyms, *S. floridanus* Leidy, 1889, *S. californicus* Bovard, 1907, and *S. fatalis* Leidy, 1868. These species had been distinguished based primarily on size; however Berta (1987) felt that size was not of primary importance in the recognition of species of

Table 1. Measurements of lower fourth premolar and first molar in *Smilodon populator* Lund, 1842, *Smilodon gracilis* (Cope, 1880), MBLUZ-P-1630, and MBLUZ-P-1629 (measurements in millimeters), (* estimate) / medidas del cuarto premolar y primer molar inferiores en *Smilodon populator*, *Smilodon gracilis*, MBLUZ-P-1630, y MBLUZ-P-1629 (medidas en milímetros), (* estimado).

		<i>S. populator</i>	<i>S. gracilis</i>	MBLUZ-P-1630	MBLUZ-P-1629
Greatest anteroposterior diameter (AP)	P ₄	31.8 - 23,5	22.0 - 18.2	28.0	
	M ₁	31.9 - 26.6	25.2 - 20.8		29.7*
Greatest transverse diameter (T)	P ₄	14.1 - 11.0	9.5 - 7.8	14 *	
	M ₁	15.4 - 12.5	7.7 - 10.5		14*

Table 2. Measurements of Metacarpal II in *Smilodon populator*, *Smilodon gracilis* and MBLUZ-P-5111 (measurements in millimeters) / medidas del II Metacarpal en *Smilodon populator*, *Smilodon gracilis* y MBLUZ-P-5111 (medidas en milímetros).

	<i>S. populator</i>	<i>S. gracilis</i>	MBLUZ-P-5111
Greatest length (GL)	90.6 - 85.5	70.9 - 74.9	87.5
Shaft width (SW)	19.4 - 16.5	11.9 - 11.3	18.3
Distal width (DW)	26.6 - 20.0	21.0-17.2	19.2

Smilodon. Kurtén and Werdelin (1990) reviewed the morphometric data provided by Berta (1985, 1987) and suggested that *S. fatalis* and *S. populator* are sufficiently distinct to justify a separate specific designation. Based on their analysis they recognized in South America *S. populator*, as the species with a distribution east of the Andes, and distinguished from the North American *S. fatalis* by the following characters: generally larger size, narrower skull with cranial part elongated relative to facial part, high nasals resulting in nearly straight dorsal profile, marked angle between mastoid and occipital plane, more "graviportal" limb bones, and extremely massive metapodials (Kurtén and Werdelin, 1990). They also recognized the presence of *Smilodon fatalis* from the west coast of South America in Peru and Ecuador, which Berta had included in *S. populator*.

The morphological characteristics of the P₄ (MBLUZ-P-1629) and M₁ (MBLUZ-P-1630), and the right second metacarpal (MBLUZ-P-5111), coincide with those proposed by Berta (1987) for *Smilodon*, and their measurements are comparable with *S. populator* based on the data from Kurtén and Werdelin (1990).

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