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Original article

Truyolsodontos estauni n. gen., n. sp., Truyolsodontidae, a new family of lamniform sharks from the Cenomanian of northern Spain

Truyolsodontos estauni *n. gen., n. sp., Truyolsodontidae, une nouvelle famille de requins lamniformes du Cénomanien du nord de l'Espagne*

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ABSTRACT

Truyolsodontos estauni n. gen., n. sp. is described based on fossil teeth from the middle and upper Cenomanian of northern Spain. The species *Protoscyliorhinus magnus* Landemaine, 1991 is withdrawn from the genus *Protoscyliorhinus* and placed in this new one. For the new genus, the new family Truyolsodontidae is proposed.

Mots clés :
Sélacien
Lamniformes
Crétacé
Cénomanien
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RÉSUMÉ

Truyolsodontos estauni n. gen., n. sp. est décrit à partir de dents fossiles du Cénomanien moyen et supérieur de l'Espagne. L'espèce *Protoscyliorhinus magnus* Landemaine, 1991 est écartée du genre *Protoscyliorhinus* et inclus dans ce nouveau genre. La nouvelle famille Truyolsodontidae est proposée pour ce nouveau genre.

1. Introduction

The material described (kept at the Geology Department of the Oviedo University under the DPO numbers cited in figure captions) come from the Cretaceous of Asturias (northern Spain) in the subbasin known as the Central Asturian Depression (Fig. 1), in fact a western expansion of the Vasco-Cantabrian basin. Although the first citations of Cretaceous fossils from this area were made in the XIX century (Schulz, 1837; Barrois, 1879), very little palaeontological work has been done until recently. Bernárdez et al. (1993) reported, without figures, the macroinvertebrate fauna known from the area. Micropalaeontological studies, except for biostratigraphy in regional geological works, have been centered mainly on the end-Cenomanian event (Dong et al., 2000; Lamolda et al., 2001; Kaiho et al., 2003; Melinte-Dobrinescu et al., 2013). The first vertebrate fossil record was that of *Coelodus* sp. cited by Llopis-Llado (1956). The first citations of selachians are in Bernárdez (1994) and the selachian fauna of the area was studied in the unpublished Ph. D. thesis of Bernárdez (2002). A summary of the vertebrate content of the La Cabaña Formation was published by Vullo et al. (2009). The formal lithostratigraphic units in this area were defined by Bernárdez (1994) and more detailed stratigraphic descriptions and sedimentological interpretations can be found on Bernárdez (2002). This work is the first contribution to the formal description of new selachian taxa from the Cretaceous of Asturias.

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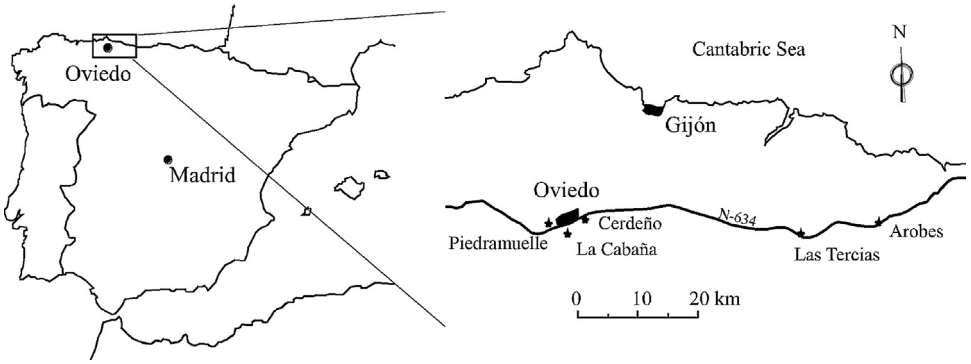

Fig. 1. Geographical situation of the studied fossil localities.
Situation géographique des gisements étudiés.

2. Geological setting

The fossils studied here come from four localities in three lithostratigraphic units; the middle Cenomanian Piedramuelle Member of the Latores Formation (Locality Piedramuelle, sample Pie-1, in the stratotypical section of the Piedramuelle Member), the middle? to upper Cenomanian La Cabaña Formation (Localities: Arobes, sample Aro-1; Las Tercias, sample Ter-2 and the stratotypic section of the La Cabaña Formation, samples Cab-1 and Cab-2) and in the upper Cenomanian-lower Turonian Las Tercias Formation (sample Cer-1, near the base of the Formation). The approximate locations are presented in Fig. 1 and more detailed location and stratigraphical setting can be found in Bernárdez (2002). A synthetic partial stratigraphic section of the sub-basin with the stratigraphical distribution of fossil localities is presented in Fig. 2.

The Piedramuelle Member of the Latores Formation is interpreted as having been deposited in a very shallow and restricted marine environment (lagoon or restricted bay) by Bernárdez (2002). Its age is assumed to be middle Cenomanian on the basis of its relative position in the general stratigraphical succession. The Pie-1 sample was collected from a bioclastic lag overlying a small erosive surface and is possibly related to a spill-over lobe caused by an exceptional, high energy storm.

The La Cabaña Formation is interpreted by Bernárdez (2002) as a muddy marine platform ranging from very shallow to external environments eastward. This unit has been dated as upper Cenomanian with ammonoids, planktic foraminifera and nannoplancton, among others (Bernárdez et al., 1993; Bernárdez, 2002; Melinte-Dobrinescu et al., 2013). Samples Aro-1 and Cab-1 come from the basal lag deposit of the formation, representing the marine flooding surface of a third order depositional sequence. Samples Ter-2 and Cab-2 are located in the basal part of the formation representing respectively very shallow inner platform and mid platform settings respectively.

The upper Cenomanian-lower Turonian Las Tercias Formation is interpreted by Bernárdez (2002) as a carbonate ramp, also deepening from west to east and with shallow inner ramp facies in the Cerdeño section. The Cer-1 sample was collected in this section and belongs to a bioclastic tempestite deposit in the upper Cenomanian part of the formation.

3. Systematic palaeontology

Class Chondrichthyes Huxley, 1880
Order Lamniformes Berg, 1937
Family Truyolsodontidae nov.
Genotype: *Truyolsodontos* n. gen.

Truyolsodontos genus nov

Derivatio nominis: Selachian genus characterized from teeth (Greek Ὁ δόντος), named in memory of the Professor Jaume Truyols Santonja (1921–2013).

Type species: *Truyolsodontos estauni* n. gen., n. sp.

Diagnosis: Lamniform shark with dentition characterized by reduced monognatic heterodonty. Crown low, even in anterior files, clearly overhanging the root in the labial face, with an ornamentation of folds converging to the centre of the face. Lingual face with ornamentation of short and less developed folds. Main cusp of almost circular section flanked by small and poorly differentiated lateral denticles. Holaulacorhize root of massive aspect with lateral branches poorly differentiated from the lingual protuberance.

Included species (in addition to the type species): *Protoscyliorhinus magnus* Landemaine, 1991.

Truyolsodontos estauni n. gen., n. sp.

2015. *"Protoscyliorhinus"* sp.–Vullo, p. 240, fig. 172d.

Derivatio nominis: Species named in memory of the professor Andrés Pérez Estaun (1947–2014).

Holotype: DPO 29.127 (Fig. 3E).

Locus Typicus: Locality Cab-1.

Material and origin: 46 teeth, of which 2 come from locality Pie-1, 2 from Cer-1, 1 from Cab-2, 1 from Aro-1, 1 from Ter-2 and 39, including holotype, from Cab-1. Excluding 35 specimens from locality Cab-1 obtained from surface collecting; all the remaining material, including the holotype, was obtained by screening with a minimum 0.25 mm mesh.

Age: Middle to upper Cenomanian.

Diagnosis: Lamniform shark whose teeth are characterized by having a holaulacorhize root, with various foramina in the basal groove and short and rounded branches in anterior teeth, whereas in lateral teeth the root is more flattened and the branches have less rounded terminations. The basal face is convex and there is a gradual transition from this to the other root faces. Main cusp low, wide at the base and quickly narrowing towards the apex in lower teeth, and similarly low, although with a triangular outline, in upper teeth. Base of the labial face of the crown clearly overhanging the root giving rise to a labial bulge and a ledge which extends also to the lingual face at the level of the lateral denticles. The labial bulge has strong folds converging to the centre of the lower part of the crown, changing from longitudinal to almost transversal. Lingual base of the crown with thin and very short longitudinal folds. Two to three low lateral cusplets on either side of the main cusp, with clawed form, distinctively recurved to the main cusp, or low and stocky when functionally eroded. Dignathic heterodonty clearly disjunct and monognathic one attenuated respective of generalized lamniforms.

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