

A NEW CONTINENTAL VERTEBRATE LOCALITY FROM THE UPPER EOCENE OF ZAMBRANA (MIRANDA-TREVINO BASIN, ALAVA, BASQUE COUNTRY)

A. Badiola (1), H. Astibia (1), A. Aranburu (2), X. Pereda-Suberbiola (1,3), X. Murelaga (1),
C. Sesé (4), M.A. Cuesta (5), S. Moyà-Solà (6), J.I. Baceta (7), & M. Köhler (6).

(1) Universidad del País Vasco/Euskal Herriko Unibertsitatea, Facultad de Ciencias, Departamento de Estratigrafía y Paleontología, Apdo. 644, 48080 Bilbao.

(2) Universidad del País Vasco/EHU, Facultad de Ciencias, Departamento de Mineralogía y Petrólogía, Apdo. 644, 48080 Bilbao.

(3) Museo Nacional d'Historie Naturelle, Laboratoire de Paléontologie, 8 rue Buffon, 75005 Paris.

(4) Museo Nacional de Ciencias Naturales, Departamento de Paleobiología, c/José Gutiérrez Ábalos, 2, 28006 Madrid.

(5) Avenida del General Goded, 37, 34005 Palencia.

(6) Institut de Paleontología "M. Crusafont", Escuela Industrial, 23, 08210 Sabadell, Barcelona.

(7) Universidad de Huelva, Facultad de Ciencias Experimentales, Departamento de Geología, Campus de la Rabida s/n, 21819 Palos de la Frontera, Huelva.



LOCATION AND STUDY AREA

The studied fossil vertebrates deposit is located on the southern part of the Basque-Cantabrian Region, near the town of Zambrana (Provincia de Álava, Basque Country). Recent field work in the upper Eocene of Zambrana has yielded continental vertebrate remains, the first discovered in the Miranda-Treviño Basin (fig. 1). This discovery increases our knowledge about the Eocene vertebrate faunas of the Iberian Peninsula.

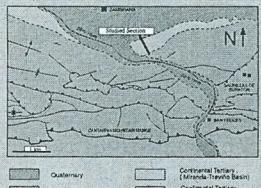


FIG. 1. Geological situation of the study area. The studied fossil vertebrates deposit belongs to a Great Miranda-Treviño Sharpen. This structure is a NW-SE basin which extends 60 Km from Ezkio to near Treviño with the prolongation of the southpennine front (Astibia et al., in press).

GEOLOGICAL SETTING

The stratigraphic section shows four sedimentary intervals: autochthon marine facies, breccia facies, lenticular facies with conglomerate facies and autochthon lacustrine facies (fig. 2 and fig. 3) (see Astibia et al., in press). The fossiliferous beds are lacustrine coal-bearing marls and limestones. Moreover, the continental deposits of the Miranda-Treviño Basin have been classically considered as Miocene (IGME, 1979; EVE, 1991), the study of the vertebrate fauna of Zambrana indicates an Eocene age. Moreover, the geological study of the area shows that the Tertiary Miranda-Treviño Basin was highly influenced by tectonic activity, and that the first compressive stresses related to the Pyrenean phase of the Alpine orogeny took place during the early Eocene.

TAPHONOMIC CONSIDERATION

Recent field work have supplied vertebrate fragments of bone, larger bone and various vertebrate fossils of teeth (fig. 3). Those vertebrate fossil remains some times show aromatic relation and present strong meteorization. Moreover, other fossil remains show low degree of reworking.

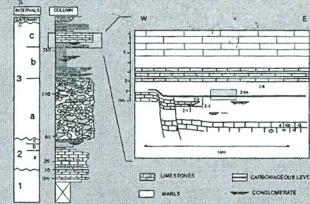


FIG. 2. Stratigraphic log and schematic section of Zambrana. This stratigraphic log is based on the outcrop located along the N-232 road that unites Concha de Haro and Miranda de Iruña towns. Note the quick inundation and the regression of the alluvial system at the later development of lacustrine system. The Zelevel has yielded most of the vertebrate fossil remains (Astibia et al., in press).

DISCUSSION AND CONCLUSIONS

The Zambrana fauna looks like those of Llamasquique (Asturias, Oviedo Basin; Casanova et al., 1991) and Mazaterón (Soria, Duero Basin; Cuesta, 1991). However, the more derived dental characters of the perissodactyls (fig. 5) (Paracerasilurus population having narrower and more hypodont lower molars; Plagiolophus populations having larger molars without cingula) and the rodent association as compared to the mentioned localities suggests a younger age for Zambrana, middle-upper Ludian (Priabonian), which corresponds to the biozone MP 18 (scale of Schmidt-Kittler, 1987). Zambrana is the first mention of vertebrates of this biozone in the Iberian Peninsula (Sudre et al., 1992; Antunes et al. 1997) and this biozone is very important in the evolution of various mammals group (Artiodactyls, perissodactyls and rodents). The mammalian fauna is comparable to the middle-upper Eocene endemic faunas from the western and Central Iberian Basins (and is clearly different from those of Catalonia and the north-Pyrenean regions).



FIG. 3.c. Photograph of the schematic section of Zambrana.



FIG. 3.d. Diagram showing the spatial distribution of the vertebrate fossil remains (more than 1 cm) at Zambrana during 1998 field work (Astibia et al., in press).

FOSSIL ASEMBLAGE

The fossil association consists of turtles (*Chelonini* indet.), crocodilians (*Diplocynodon* sp.) and mammals, including possible insectivores (*Lipotyphla* indet.), rodents (*Theromys* aff. *göpel*, *Elomys* aff. *panulus*, *Pseudochoreomys* indet., *Glires* sp.?) (fig. 4), carnivores (cf. *Quercyonide* sp.), artiodactyls (*Xiphodontidae* indet.) (fig. 5) and perissodactyls (*Paracerasilurus* sp., *Plagiolophus* sp., *Artiodactyla* indet., *Perissodus* sp.) (fig. 6).

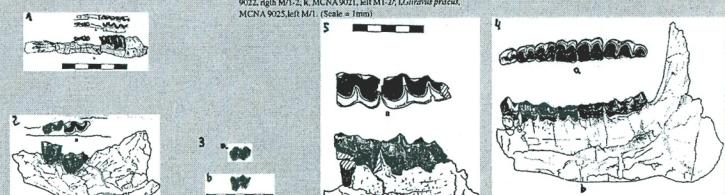


FIG. 4. The perissodactyls of the site in Zambrana. 1 (a-b), *Paracerasilurus* sp.; MCNA 9009, right mandible (M1-M3); (a) occlusal view, (b) lingual view; 2 (c-d), *Plagiolophus* sp. (subfamily *Plagiolophinae*); MCNA 9002, fragment of the left hemimandible (M1-M2); (c) occlusal view, (d) lateral view; 3 (e-f), *Theromys* aff. *göpel*; h. MCNA 9015, left M1-2; i-k, *Theromys* aff. *göpel*; i-h. MCNA 9016, right M1-2; l, *Lomomys* sp. 2002, left M1-2; j, MCNA 9022, right M1-2; k, MCNA 9021, left M1-2; l, *Glires* sp. 2002, right M1-2; m, MCNA 9025, left M1. (Scale = 1 mm).

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