Morphometric Differences among the Equids of the Upper Pleistocene from Valdegoba (Burgos, Spain)

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Abstract

Equid remains are frequent in Pleistocene deposits. The equid remains studied were from Valdegoba's cave (Northwestern Burgos, in the northern Iberian Peninsula, Spain) dated to Upper Pleistocene. Morphometric and morphological features of permanent premolars and molars have been investigated. The combination of both metrical and morphological features has allowed us to differentiate two forms in the site. The big one presents the characteristics of caballoid horses and the small one presents the own features of stenoid horses. We have assigned the caballoid material to E. ferus and the stenoid remains to E. hydruntinus.

Keywords: Equids; Dental Morphology; Espana

Introduction

Valdegoba's cave is a small cavity located 28 Km northwest Burgos, on the northern Iberian Peninsula (42º32'36'' N. and 3º46'27'' W). The first excavations were carried out in the 1980's during which a great amount of faunal remains and evidence of lithic industry were found (Díez et al., 1989; Quam et al., 2001). An important collection of ungulates has been recovered: Stephanorhinus hemitoechus, Equus ferus, E. hydruntinus, Sus sp., Cervus elaphus, Capreolus capreolus, Rupicapra rupicapra and Capra pyrenaica. Particularly, a large amount of dentition was represented within their material. Carnivores of great diversity have been identified. Canis lupus stands out among these, as well as Vulpes vulpes, Ursus arctos, Ursus spelaeus, Meles meles, Lutra lutra, Martes sp. Crocuta crocuta, Felis silvestris, Lynx pardinus and Panthera pardus. Dental remains and some postcranial bones from

Homo neanderthalensis have been discovered too. Information on microfauna, macrofauna and the ESR studies from the flowstones and from the capping spelothem place the site in the early phases of Upper Pleistocene.

Materials and methods

In this case, we studied the equid remains because we found two different morphometrical types. A total of 602 dental remains were recovered. In this case, we only used permanent premolars and molars because the main differences are found precisely in these teeth (table 1). We have used the terminology proposed by Eisenmann et al., 1988. The morphological features were compared following the characteristics observed by Maldonado (1996) at different sites on the Iberian Peninsula. We have followed the biometrical criteria defined by Eisenmann et al., 1988 in the "Hipparion Conference" (Figure. 1). The measurements are expressed in millimeters. We have taken them from the middle of the crown.

PERMANENT PREMOLARS AND MOLARS RECOVERED

		P_2	P_{3-4}	M_{1-2}	P^2	P^{3-4}	M^{1-2}	M^3
Equus ferus	125	7	19	24	13	30	19	13
Equus hydruntinus	40		3	9	2	16	10	3
Total	165	7	22	33	15	46	29	13

Table 1. Equid pemanent teeth recovered at the site.

Results

Taking into account the morphological features observed by Maldonado (1996), we have divided the remains into two groups. The first one (A) represents lower premolars and molars with "U" shaped entoflexid with straight protoconids and hipoconids. The second group (B) shows the "V" shaped entoflexid, and concave protoconids and hipoconids (Figure 2). Upper premolars and molars present more differences. In the first group (A) we can observe that the styles have a groove whereas in the other group (B) this structure is absent. Another characteristic displayed in the first group is the pli caballin in premolars and long and rounded protocones in upper premolars and molars. The second group (B) shows a small concavity in the lateral view, while the first one doesn't present this structure. The second group lacks pli caballin and their protocones are narrow and triangular (Figure 3). Biometrically, we could differentiate between two groups; a group with large dimensions and another one with small dimensions. The big one corresponds to the first group and the small one to the second group (Figure 4). As soon as we had all the information, we compared our equids with other sites from the Iberian peninsula belonging to the Upper Pleistocene. The differences show that the large Equus teeth recovered present similar size of the large equids from Abric Romaní (Barcelona), Cova Negra (Valencia), Los Casares (Guadalajara), Cueva del Buho (Segovia) and Cueva Millán (Burgos). The second horse is similar to a small horse from Upper Pleistocene discovered in Cova Negra (Valencia), Los Casares (Guadalajara) and La Carihuela (Granada) (Arceredillo, 2008).

Discussion

Equid remains are frequently found in Pleistocene deposits. Only one genus - Equus is presented on the Iberian Peninsula during Pleistocene. This genus presents two different lineages: stenonid and caballoid horses. The first one is characterized by smooth styles, short protocones and "V" shaped entoflexids. Whereas, the second one shows large protocones and "U" shaped entoflexids. Caballoid horses feature a rounded metaconid and present a pticostilid pli (Arceredillo, 2008). In the Middle Pleistocene a small equid appears in Europe. This horse reaches its widest distribution during the Upper Pleistocene. This equid shows features similar to stenoid and caballoid horses. Due to this fact, Regalia (1907) defined the species Equus hydruntinus. However, the most representative horse in Europe during the Upper Pleistocene is E. ferus. This horse present the own features of caballoid equids and is represented at most sites on the Iberian Peninsula.

Conclusions

A great amount of dental remains have been recovered at the site. We measured them depending on their level of conservation. The combination of both metrical and morphological features has allowed us to differentiate between two forms at the site. The large form represents the characteristics of caballoid horses and the small one presents features of stenoid horses. We have assigned the caballoid material to E. ferus and the stenoid remains to E. hydruntinus.

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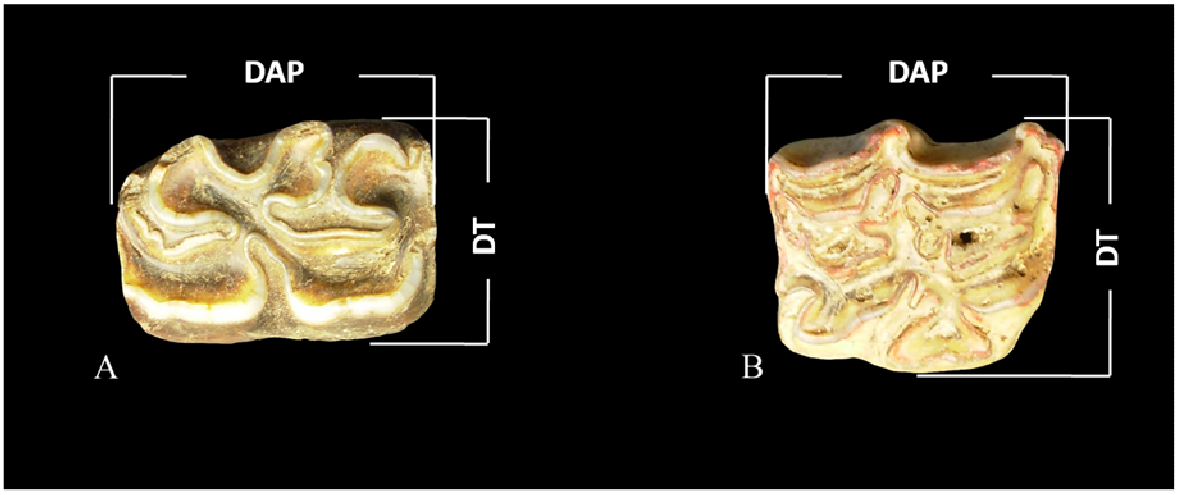

Figure 1. Measurements used in upper and lower premolars and molars. These measurements have been taken from the middle height of the crown.

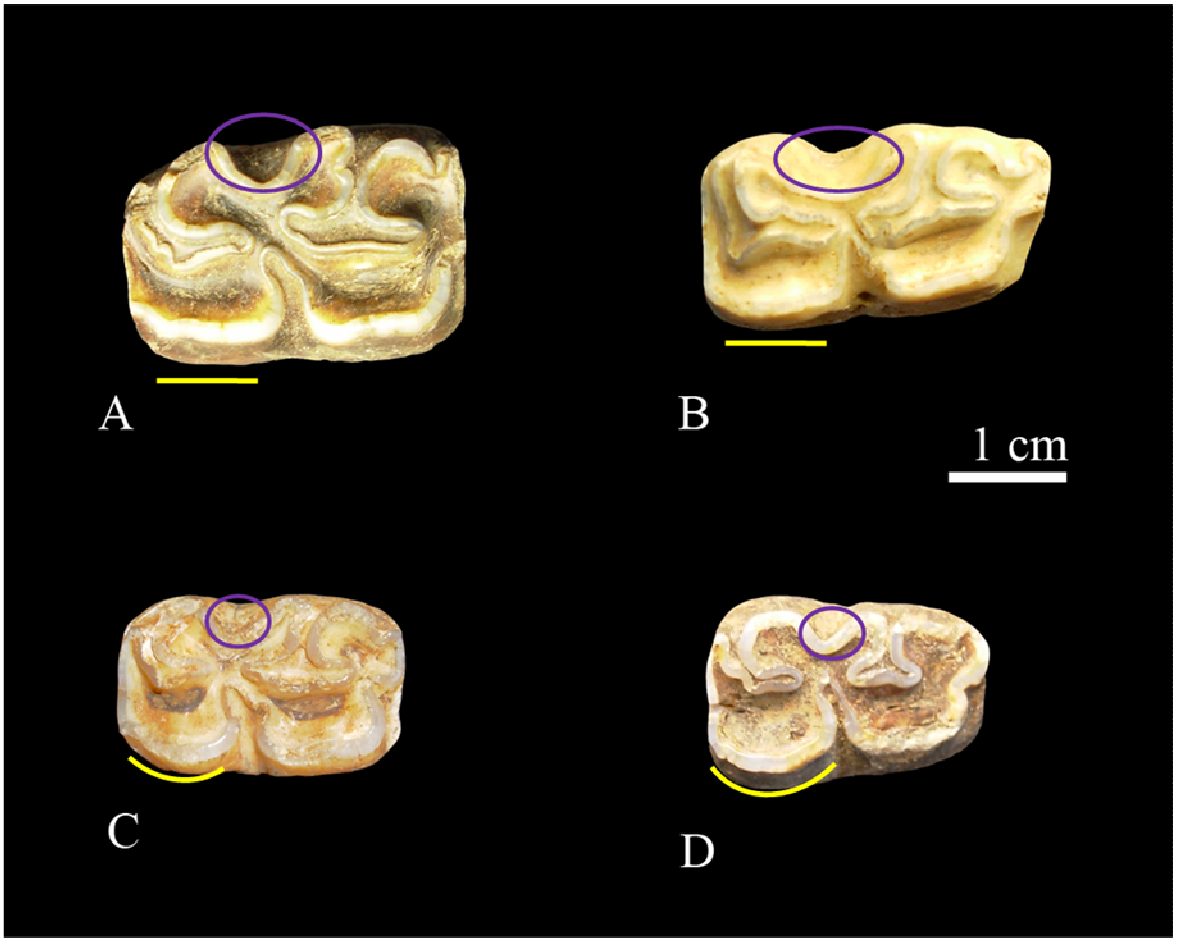

Figure 2. Morphological differences in lower premolars and molars among the two equids. A) Premolar of Equus A; B) Molar of Equus A, C) Premolar of Equus B, D) Molar of Equus B.

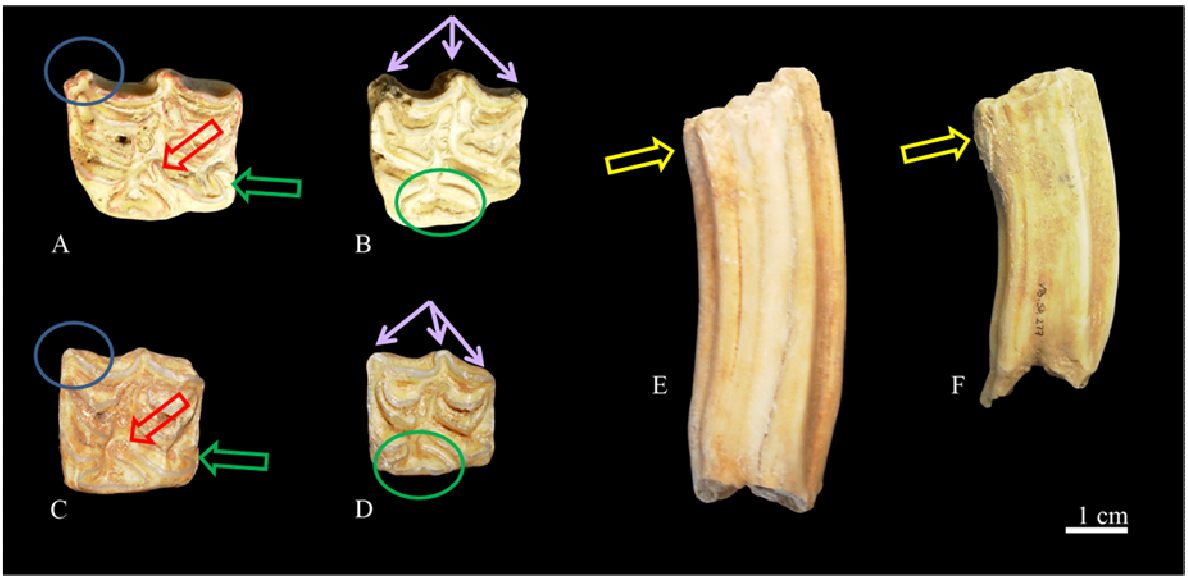

Figure 3. Morphological differences in upper premolars and molars among the two equids. A) Premolar of Equus A; B) Molar of Equus A, C) Premolar of Equus B, D) Molar of E Equus B. E and F) differences in lateral view E) Equus A F) Equus B

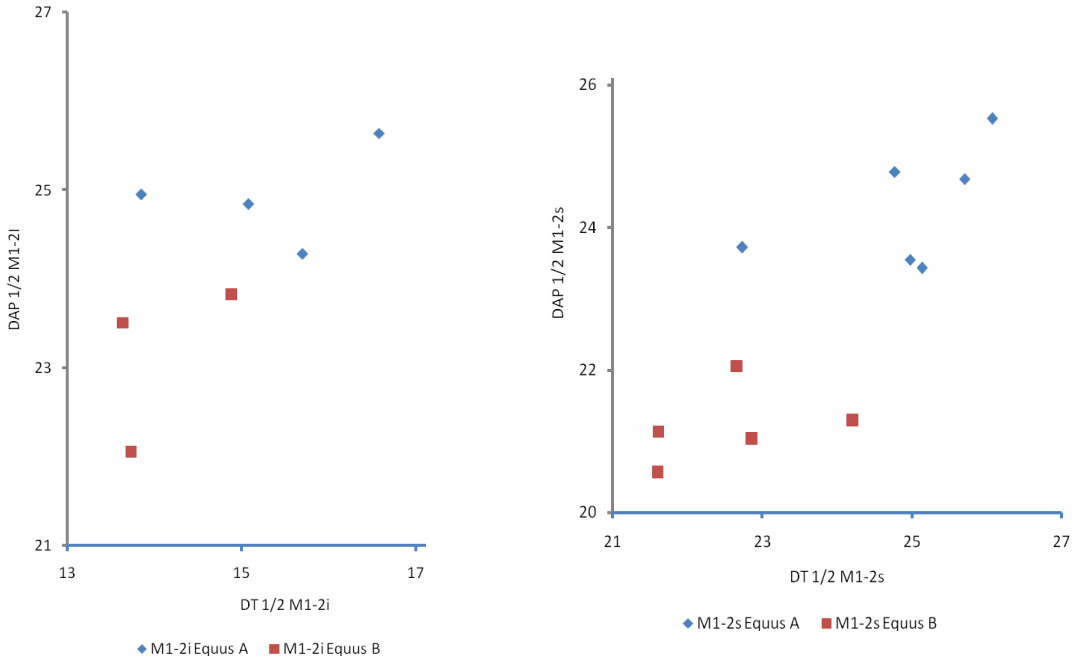

Figure 4. Biometrical differences among the two species recovered.

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