

SMALL EQUID REMAINS FROM THE EARLY MIDDLE PLEISTOCENE OF VALLPARADÍS (TERRASSA, BARCELONA, SPAIN)

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The construction of a railway station in the Parc de Vallparadís (Terrassa, Barcelona, Spain) recently offered the opportunity to undertake a series of paleontological excavations in a 20 m thick Pleistocene section. Twenty fossiliferous levels, originated in an alluvial/colluvial depositional environment and interbedded by catastrophic events were recognized, ranging from the late Early to the Middle Pleistocene (as inferred from the associated fauna and magnetostratigraphic data). The remains reported here were recovered from an early Middle Pleistocene level, being associated with *Cervus elaphus*, *Vulpes* sp. and *Equus* sp. (large form). Several Eurasian Pleistocene sites have yielded equid remains resembling the extant African *E. asinus* (donkeys or asses) and *E. hemionus* (onagers or Asian wild asses), as well as the extinct *E. stenorhinus*, which is thought to be related to zebuline species. The extinct European ass, *Equus hydruntinus*, resembles onagers by the slenderness of its limb bones, and asses by its small dentition; however, its characteristic stenorhinid lower dentition has been used to argue that it is not closely related to either of them. Thus far, the earliest record of *E. hydruntinus* corresponded to the Middle Pleistocene of Lunel Viel (France), further being widely distributed throughout Eurasia until the Holocene. On morphological grounds, *E. hydruntinus* has been considered to be a descendant of *E. altidens* (another stenorhinid 'horse'); cranial morphological analyses have shown that *E. hydruntinus* is closely related to *E. hemionus*, which has been recently confirmed by DNA analyses. Here we report fossil remains of at least two individuals of *Equus* cf. *hydruntinus* from Level 11 of Vallparadís, which would represent the earliest record for that species. The dentition displays classical stenorhinid characters such as V-shaped linguaflexids and deep ectoflexids in the lower teeth and short protocones in the upper teeth, further sharing with asses a microdont condition. Postcranial bones are slender and indicative of cursorial habits, resembling the condition of extant and fossil onagers, and thus confirming a close phylogenetic relationship between them.

Technical Session I, Wednesday 8:30

TECTONIC HISTORY AND MAMMALIAN DIVERSITY

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Diversity gradients in modern and Cenozoic mammalian faunas show the highest species richness in tectonically active regions. In contrast, tectonically stable environments at the same latitude harbor lower species richness. This pattern has long intrigued biogeographers and ecologists, who have focused mainly on how elevational gradients accommodate high species richness. The close proximity of life zones, each with a different climate and vegetation, explains the high spatial turnover of species in relation to topography, giving rise to high regional richness and ecological diversity.

Evolutionary processes should also differ from tectonically active to stable regions. I evaluate the hypothesis that tectonically active regions (mountain belts and rift valleys of active plate margins) have promoted speciation in excess of extinction of continental mammals over geologic time. High topographic heterogeneity generates new habitat and isolates populations, resulting in diversification of lineages and high species richness. In contrast, tectonically stable regions (passive margins) feature large areas of continuous habitat with few barriers, resulting in low rates of speciation and extinction and lower species richness. The fossil record provides a test of several critical predictions. Data from the Cenozoic mammalian record of North America and Eurasia support this hypothesis—with mammalian faunas in upland environments exhibiting greater species richness than coeval faunas in basin interiors or coastal regions. Also, several persistent but puzzling features of the mammalian fossil record, including low rates of speciation in long fluvial sequences and missing early members of major clades, follow from the tectonic control of diversification. This idea links earth history to geographically varying macroevolutionary processes.

Poster Session III, (Friday)

SYSTEMATIC REASSESSMENT OF EARLY CRETACEOUS MULTITUBERCULATE FOSSILS FROM GALVE (TERUEL, SPAIN)

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The Late Jurassic and Early Cretaceous (Tithonian-Barremian) bone-beds of Galve (Teruel, NE Spain) are included in four formations of the Galve sub-basin (Maestrazgo Basin, Central Iberian Range). There are diverse marine and continental vertebrate fossil assemblages distributed along these stratigraphically well-correlated sequences. Moreover, Galve is the type locality of eleven taxa. Multituberculates are the most abundant and diverse mammalian faunas. These come from the late Hauterivian-early Barremian and

early Barremian sites of the El Castellar and Camarillas Fm., respectively: the eobaatarid *Eobaatar hispanicus*, the paulchoffatiids *Galveodon nannothus* and *Parendotherium herroeri*, and the pinheirodontid *Lavocatia alfambrensis*. Here we present a systematic reassessment of isolated multituberculate teeth previously studied by Adrover and Crusafont and Crusafont and Gibert. The fossils were collected during the sixties and seventies by several German and Spanish teams, possibly from the sites of Colladico Blanco (El Castellar Fm.) and Herrero (Camarillas Fm.). Four teeth described by Crusafont and Gibert as Forma 1 (P4) and Forma 5 (P4/5), and Forma 2 (P5) and Forma 3 (I2), which on the basis of the illustrations provided by these authors were assigned to *E. hispanicus* and *P. herroeri*, are missing. The rest of the collection (twenty-four teeth) are here assigned to at least four taxa: *Eobaatar hispanicus*; two different paulchoffatiid taxa, the tiny one being tentatively assigned to *G. nannothus*, while the other one is provisionally described as Paulchoffatiidae indet.; and ?Plagiulacidae gen. et sp. nov. The latter is also present in the late Hauterivian-early Barremian site of La Cantalera, in Teruel (Oliete sub-basin of the Maestrazgo Basin). A new taxon is added to the Early Cretaceous multituberculate faunal list of Galve. This is here tentatively assigned to Plagiulacidae, in which case it would be the first of this family in the Iberian Peninsula. The species *Parendotherium herroeri*, by contrast, is only known by the lost holotype (I2) and should perhaps be considered *nomem nudum*.

Technical Session XI, Friday 9:45

CREODONTS, ARTIODACTYLS AND CONDYLARTHS FROM EARLY EOCENE CAMBAY SHALE, VASTAN LIGNITE MINE, GUJARAT, WESTERN INDIA

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In recent years, the early Eocene Cambay Shale (ca. 54 Ma) at Vastan lignite mine, District Surat, western India, has yielded a diverse terrestrial mammal assemblage. This assemblage, the oldest known from the Cenozoic of South Asia, is of considerable biogeographic interest when seen in the context of India-Asia collision (Out-of-India and/or In-to-India dispersal). Ongoing investigations at the Vastan mine have yielded two new taxa (hyaenodontid, condylarth), and additional specimens of the artiodactyl *Gujaratia*. The Vastan hyaenodontid is a small proviverrine that differs from *Paratritemnodon* in its lower trigonid, and narrower M/3 talonid; from South Asian proviverrines *Yarshea* and *Kyawadawia*, by its much smaller size; from European *Proviverra* in having an anteriorly shifted paraconid; cristid obliqua angled towards metaconid rather than protoconid and in progressive size reduction of metaconid from M/1-M/3, and from most North American proviverrines by much smaller size. The Vastan condylarth is known from a single tooth that is reminiscent of arctocyonids such as *Arctocyon* and *Claenodon* in its large size and simple cusp morphology. New specimens of the dichobunid *Gujaratia indica* include a well preserved upper dentition and lower jaws. The two species of *Gujaratia* (*G. indica* and *G. pakistanensis*) are a morphologically homogeneous group. *Gujaratia* differs from the North American *Diacodexis* in having smaller paraconids and shallower and narrower proto-metaconid notch on the lower molars, and in their narrower and longer lower premolars. Upper molars of *Gujaratia* differ from North American *Diacodexis* in being lingually narrower, with the usual absence of any trace of any hypocone. *Diacodexis* species from Europe are relatively diverse, resembling *Gujaratia* in some regards and differing in others. *D. varleti*, for instance, lacks any trace of the hypocone on the upper molars, just like *Gujaratia*, but it has larger paraconids on the lower molars, unlike *Gujaratia*.

Poster Session IV, (Saturday)

ADULT MORPHOLOGY AND VARIATION WITHIN THE OVIRAPTORID KHAAN MCKENNAI (THEROPODA: OVIRAPTOROSAURIA)

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Oviraptorosauria, a morphologically distinctive lineage of coelurosaurian theropods from the Cretaceous of Asia and North America, recently has been the focus of numerous phylogenetic studies, most of which reveal conflicting results. These evolutionary hypotheses differ not only concerning the placement of Oviraptorosauria within Theropoda (e.g., placing it alternatively within avialans or as a less derived clade of non-avian theropods), but also produce little resolution about the interspecific relationships within the group as a whole. Despite the large amount written on the phylogenetic history of this group, surprisingly few detailed descriptions are available for oviraptorids. This generalization holds true particularly for the postcranial skeleton. Because of the relatively complete nature of many of the specimens within Oviraptorosauria, it provides the ideal opportunity to document osteological variation within one specific taxon. In this analysis we focus in particular on the osteology of *Khaan mckennai*, a taxon for which multiple complete specimens are available, foremost to provide a detailed description of its cranial and postcranial osteology. We also utilize computed tomographic (CT) scans in the description, which allows for a detailed analysis of the endocranial spaces such as the cranial cavity and temporal recesses. Although only a few examples of interspecific variation are present, this variation is present in all regions of the skeleton. We also present our preliminary hypothesis of phylogenetic relationships within Oviraptorosauria so that the variation revealed within *Khaan mckennai* can be assessed in at least two different levels of inference in order to help discriminate between interspecific and phylogenetic variation.