Eocene mammalian fossil record and biodiversity from Iberia: New primate and sirenian discoveries and palaeobiogeographic implications

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New finds of mammals from the Eocene of the Iberian Peninsula, including rodents, primates, artiodactyls, perissodactyls, and sirenians, are crucial to investigating the evolutionary and palaeobiogeographic history of the Eocene mammalian faunas across Europe. The fossils come from the Pyrenean Realm and from adjacent Cenozoic basins of the Basque-Cantabrian region and central Iberia (Fig. 1). Many of the remains are already published (Astibia et al., 2010; Badiola et al., 2009 and references therein; Cuesta and Badiola, 2009; Marigó et al., 2010, 2011a; Minwer-Barakat et al., 2010; Quer and Agustí, 2010), whereas others are unpublished or their study is still ongoing.

Middle and late Eocene perissodactyl faunas of the western and central Iberian basins (Duero, Almazán, Oviedo and Miranda-Trebiño basins) are clearly different from those of the southern Pyrenean basins (Fig. 1). In contrast, the Eocene mammalian faunas of the southern Pyrenees are similar to those of the southern part of the Central European Island (southern France, Switzerland), where the typical western Iberian endemic taxa are absent. On the basis of this faunal differentiation the existence of the Western Iberian Bioprovince is hypothesized (Badiola et al., 2009). Five genera and 16 species of equoids and five taxa of lophiodonts, which are unknown elsewhere in Europe, have been identified so far in this bioprovince. In the context of Iberian biochronology, rodent, primate and artiodactyl fossils have been less well known than perissodactyls. However, various middle and late Eocene taxa of artiodactyls, rodents and primates found in this bioprovince may also support the endemism of these faunas (Badiola et al., 2009). The endemic nature of the primates is supported mainly by adapoid taxa, such as the new genus and species Mazaterodon endemicus found in the Almazán Basin (Marigó et al., 2010). The study of the first fossil record of microchoerine omomyids from the Western Iberian Bioprovince is in progress in collaboration with the aforementioned authors from the Institut Catalá de Paleontologia (ICP) of Barcelona. These fossils will extend what is known in this matter. Further and more detailed information about Eocene primate fossils from Iberia can be found in Marigó et al. (2011b).

Recent discoveries and investigations of new sirenian material from the Pyrenean Realm illustrate the high palaeontological potential of the Iberian Peninsula for marine mammals too. The best-known sirenian fossils, consisting of various cranial and postcranial remains, come from the Bartonian deposits of the eastern margin of the Pyrenean Realm. The fossils were initially described as Prototherium...
The earliest sirenian fossils from Western Europe have been found in the Urbasa and Andia Mountains (Navarre), and in the Ainsa Basin (Huesca) (Fig. 1). Two partial atlases, one humerus fragment, and several dorsal ribs found in two beds in Navarre are dated as late Lutetian and referred to Dugongidae indet. (Pilleri et al., 1989; Astibia et al., 1999). A large number of disarticulated vertebrae and ribs are described from the Uztarroz and Ardanatz sites in the Pamplona Basin. According to their morphology as well as the biogeographical and stratigraphic data, they seem to be closely related to a basal dugongid such as Protherium (Astibia et al., 2005). Our recent field and research activities have extended the distribution of the sirenian fossil record to most of the western Pyrenees. The earliest sirenian fossils from Western Europe have been found in the deltaic deposits of the Sobrarbe Formation, which is dated as late Lutetian (De Federico, 1981; Bentham, 1992). The morphology of the fossils is consistent with referral to basal forms of Dugongidae, the only sirenian clade known so far in the middle Eocene of Europe, sharing some cranial morphological features with Protherium and Etheroides. These fossils, as well as those found at other Lutetian sites of the Sobrarbe Fm., the study of which is in progress, will be essential in investigating the palaeobiogeography and evolution of the first clades that appeared in the Tethys Seaway during the rapid early middle Eocene diversification of the group.

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