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« *Fossiles, Evolution, Mouvement* »

Résumés / *abstract*

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EUROPEAN OLIGO-MIOCENE RHINOCEROTIDS: DIVERSITY AND ECOLOGY

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Rhinocerotids are hoofed mammals with odd-toed feet, and typically have three toes, although few taxa bear four toes on their front feet. Their axis of symmetry and weight-bearing run through the middle digit of each foot. Of a huge past diversity, only four genera and five species (*Rhinoceros sondaicus*, *Rhinoceros indicus*, *Dicerorhinus sumatrensis*, *Ceratotherium simum*, and *Diceros bicornis*) survive today. White rhinoceroses are very efficient grazers, while others are mainly leaf-eating browsers. Most of them are large-bodied (more than 1000 kg) and graviportal, and occupy a rather wide range of terrestrial habitats, from open grassland (*Ceratotherium simum*, *Rhinoceros indicus*) to open woodland (*Rhinoceros sondaicus*, *Diceros bicornis*) and dense forest (*Dicerorhinus sumatrensis*). More often, extant rhinoceroses tend to be solitary or form small groups of females and calves, as they usually live in somewhat forested habitats unsuitable for large herds.

Regarding the fossil history, rhinocerotids have been one of the most diverse and common, ecologically dominant, and successful group of hoofed mammals, particularly throughout the Oligocene. Their anatomical types were highly variable, from primitive small-sized leaf-eaters to long-legged and running forms, or to a variety of hippo-like rhinos. During the Oligocene and the Early Miocene in Western Europe, climatic and environmental changes occurred, leading to evolutionary responses of mammals; the rhinocerotids were represented by ten genera and nineteen species. After their first appearance in Western Europe linked to the "Grande Coupure" event, the diversity of rhinocerotids was rather constant during the Oligocene and the Early Miocene, but three major faunal renewals occurred during the mid-Oligocene, the latest Oligocene and the end of the Early Miocene with the first "Proboscidean Datum Event". The beginning of the Oligocene matched with the occurrence of the first true Rhinocerotidae and the opening of forested environments. The climate seemed to become more arid, and the Rupelian/Chattian boundary was marked by a tendency to cooling. During the Chattian, the climate was led by the Late Oligocene Warming and the rhinocerotid diversity was quite stable, although the group presented weak, but perceptible predispositions to brachypody and increasing crown-height. The climate was marked by a crisis at the terminal Chattian leading to the Mi-1 Glaciation Event (Zachos et al., 2001) and implying a drastic rhinocerotid fauna renewal (Becker et al., 2009). Afterward, the environmental conditions evolved to stabilization and offered a wide range of biotopes during the Early Miocene. At the "Proboscidean Datum Event" (Burdigalian/Langhian boundary), the rhinocerotids were strongly perturbed by African and Asian migrants, while again the climate changed into a more continental and arid way due to closure of the Tethys.

References

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EVOLUTION OF NON-RUMINANT, HOOFED MAMMALS DURING THE OLIGOCENE AND EARLY MIOCENE IN WESTERN EUROPE

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Organization of the continents, geography, climates, and environments are in constant evolution since mists of time, controlling the vegetal and animal communities. Western Europe was affected by important changes during the Cenozoic, and particularly between the Late Eocene and Middle Miocene (34-15 Ma). The best known faunal interchanges of this period are the “Grande Coupure” in the Eocene/Oligocene boundary and the “Proboscidean Datum Event” in the late Early and Middle Miocene. Hoofed mammals (namely perissodactyls and cetartiodactyls) probably emerged during the Early Eocene in Southeast Asia, and their first migrations occurred rapidly after their diversification: North America and Europe were conquered in the Early Oligocene, as soon as the Bering and Turgai Straits closed, and Africa was reached, first sporadically, then continuously, when it was connected with Eurasia by emerged land-ways, particularly during the Middle Miocene.

The recent palaeontological reassessment of European Tapiridae, Anthracotheriidae, Suoidea (Scherler, 2011; Scherler et al., 2011), and Rhinoceroidea (e.g., Becker, 2009; Becker et al., in press) allowed the establishment of precise biostratigraphic evolution and palaeobiogeographical distribution. The Oligocene, considered by many as a quiet period, was on the contrary highlighted by few but marked faunal events, at least at the level of the terrestrial herbivores. It appeared also that the observed mammalian turnovers coincided mostly with the major glaciations recorded in Antarctica (Scherler, 2011).

References

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