University of Fribourg / Faculty of Science and Medicine / Department of Geosciences

Impact of the Grande Coupure event (Eocene/Oligocene boundary) on the evolutionary history of European Rhinocerotoidea (Perissodactyla, Mammalia)

Jérémy Tissier

The Rhinocerotoidea are one of the three extant superfamilies of perissodactyls. They comprise at least five families: the Rhinocerotidae (the only family still having extant representatives, with five species remaining today), the Amynodontidae (a group of hornless rhinoceroses, most of whose representatives possessed a proboscis like tapirs), the Paraceratheriidae, which include the largest land mammal that ever lived, and two groups of small sized and cursorial rhinoceroses: the Eggysodontidae and the Hyracodontidae. The Rhinocerotoidea first appeared during the Early Eocene (around 50 Million years ago), though in Europe, they only appeared for the most part just after the Eocene-Oligocene transition, during an event called the “Grande Coupure”. This event characterizes an extinction crisis affecting the endemic Eocene European fauna, possibly related to several external environmental factors, such as the Oi-1 glaciation. Numerous groups until then unknown in Europe, first appeared. Among those, the Rhinocerotoidea are some of the most well represented, but have been rather understudied.

In the first part of this thesis, I revised two of these families from the Late Eocene to the Oligocene of Europe: the Amynodontidae and the Rhinocerotidae. This revision is based on the description of new specimens from Eastern Europe (Romania and Hungary) and Switzerland. One new genus of Amynodontidae has been described from Romania, and two new species of Rhinocerotidae have been identified, in the Swiss locality of Bumbach. Three new phylogenies are proposed, one resolving the relationships of the Amynodontidae, another aiming at understanding the relationships among the different species of *Ronzotherium* Aymard, 1854, and a final one untangling the phylogeny of the Early Rhinocerotidae. This latter permitted to discuss the evolution of one of the key adaptations of the rhinocerotids: their anterior dentition.

In the second part of this thesis, I tackled the subsequent diversity of the European Rhinocerotidae, from the latest Oligocene to the early Middle Miocene, as well as another group of perissodactyls, belonging to the Equoidea: the Anchitheriinae. This diversity has been examined via the study of new specimens from Switzerland and from Bosnia-Herzegovina, where a new rhinocerotid species has also been identified.

Finally, in the discussion, I have tried to analyse the palaeobiogeography of the Rhinocerotoidea in relation with the Grande Coupure event, and proposed a new scenario based on palaeogeographical reconstructions.

Jury:
PD. Dr. Damien Becker (thesis supervisor)
Prof. Dr. Walter Joyce (thesis co-supervisor)
Prof. Dr. Pierre-Olivier Antoine (external co-examiner)
Dr. Luca Pandolfi (external co-examiner)
Prof. Dr. Bernard Grobéty (president of the jury)