

A new species of *Ronzotherium* and a solved mystery

Am 5. März 2022 konnte in Glarus zum vierten Mal der Oswald Heer-Wissenschaftspreis verliehen werden. Das Preisgeld wurde wie bisher vom Walters-/ Wild-Fonds ausgerichtet. Die Preisausschreibung, die Evaluation von Kandidatinnen und Kandidaten aus der Schweiz aus den Fachbereichen Paläontologie, Botanik und Geologie, die Organisation und Finanzierung der Preisfeier in Glarus erfolgte wiederum durch die Naturforschenden Gesellschaften Glarus und Zürich sowie durch den Historischen Verein Glarus.

Mit dem Preis wurde der Paläontologe Jérémy Tissier (*1990) für seine Publikation «New species, revision, and phylogeny of *Ronzotherium* Aymard, 1854 (Perissodactyla, Rhinocerotidae)» über heute ausgestorbene Nashorn-Arten des Tertiärs (Eozän/ Oligozän) ausgezeichnet. Diese Arbeit beruht auf Tissiers Dissertation von 2020: «Impact of the Grande Coupure event (Eocene/Oligocene boundary) on the evolutionary history of European Rhinoceroidea (Perissodactyla, Mammalia)».

Der ursprünglich aus Orléans stammende Paläontologe studierte zunächst an der Université de Poitiers (Lizenziat 2012), dann an der Université Paris VI, Sorbonne (Master 2014) und arbeitete 2014-2015 als Techniker der Sammlungen des Muséum National d'Histoire Naturelle, Paris. Von 2015-2016 war er Paläontologie-Experte daselbst. 2016-2020 folgte unter der Leitung von PD Dr. Damien Becker das Doktoratsstudium an der Universität Fribourg/ CH und am JURASSICA Museum von Porrentruy/ JU. Von 2020-2021 war Jérémy Tissier als Studien-Assistent am oben erwähnten Museum tätig. Seit 2021 absolviert der Preisträger bis 2023 einen Postdoc-Aufenthalt am American Museum of Natural History, Division Paleontology, New York/ USA.

Conradin A. Burga

Rhinocerotidae are perissodactyl mammals that were once an important and diverse group of large herbivores in Europe. Although they are now extremely endangered, they comprised many more species in the past and had a very wide distribution, from North America to Europe through Africa and Asia.

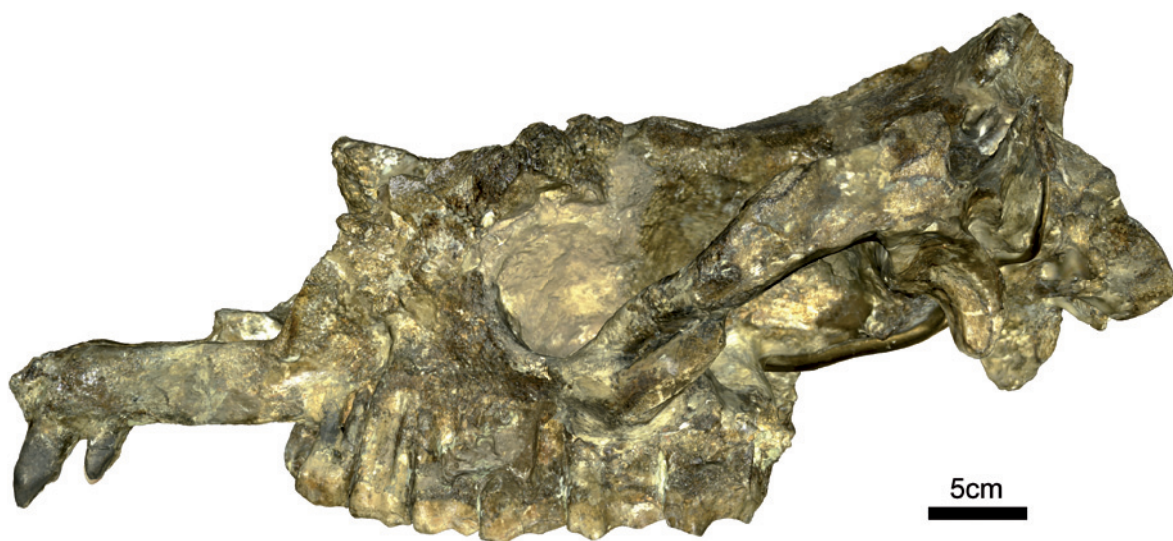
In Western Europe, their first apparition is related to the Grande Coupure event: a major faunal event recorded at the Eocene-Oligocene transition, around 34 million years ago. This event was caused by a global cooling (the Oi-1 glaciation), which led to a global drop in sea level, allowing new faunal exchanges from Asia and Eastern Europe to Western Europe. Among these newcomers, *Ronzotherium* is one of the first Rhinocerotidae in Europe.

A remarkable animal

This hornless rhinoceros is remarkable for several reasons: it was one of the largest terrestrial mammal of the Oligocene of Europe, and one of the earliest-branching Rhinocerotidae. It still retains several primitive characters, such as a greater number of incisors compared to modern rhinoceroses. Unfortunately, due to the lack of studies on this genus, many specimens found throughout Europe have remained misidentified or unidentified, notably some specimens from the Swiss locality of Bumbach (Bern Canton, Switzerland).

It is in this context that a complete revision of this genus was undertaken by a team of three palaeontologists from Switzerland and France (Tissier et al. 2021), funded by the Swiss National Science Foundation.

Ronzotherium classically included up to five species, but most of them are poorly defined and hard to distinguish from each other. It was thus important to look at and describe as many specimens as possible from all over Europe, to have a better understanding of its morphological diversity. To better support and identify each species, as well as to determine its relationships to other rhinoceroses, a phylogenetic analysis



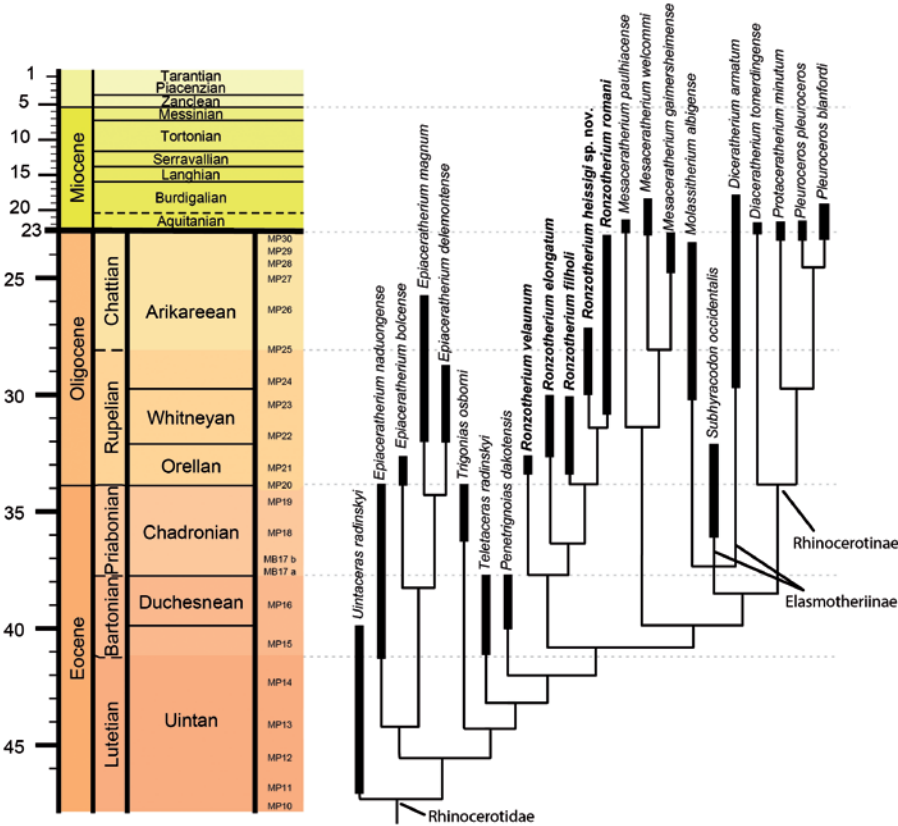
Above: Mandible of *Ronzotherium heissigi* from Bumbach, in the Naturhistorisches Museum Basel. Below: Type skull of *Ronzotherium heissigi* from France, in the Muséum National d'Histoire Naturelle, (Paris).

was computed using a matrix of morphological characters. We included all the type specimens of *Ronzotherium*, as well as many other well preserved specimens, and other rhinocerotids.

The results of the analysis support almost all previously identified species, as well as a new one, which was unexpected. It was named *Ronzotherium heissigi* after one of the major investigators of this rhinoceros (Prof. Dr. Kurt Heissig), and it was found in Switzerland, in Bumbach (Bern Canton), as well as in France. The re-study of specimens from old collections thus allowed the discovery of a new species that had remained totally unknown for several decades.

Another unexpected result was that we have been able to solve a mystery that remained unsettled for at least ten years: was *Diaceratherium* (a derived rhinoceros most commonly found only in the Miocene period) present in Europe at the same time as *Ronzotherium*, already in the middle of the Oligocene? Based on a previous study, postcranial bones from a locality near Marseille had been attributed to *Diaceratherium*, due to its characteristic stout legs, besides cranial and dental remains of *Ronzotherium romani*.

However, our study suggests that these stout bones, which are also found in one other locality in Europe from a similar age, can in fact



Phylogenetic relationships of *Ronzotherium* and other Rhinocerotidae (from Tissier et al. 2021)

be attributed to *Ronzotherium romani*, and not to *Diaceratherium*. This is also supported by the fact that in these two localities, no teeth or cranial fragments of *Diaceratherium* were found, contrary to *Ronzotherium*. However, since most other species of *Ronzotherium* have very elongated legs, its teeth had never been associated with the postcranial remains. We now suggest that at least one species had stout legs, which could imply a different ecology from the other species, possibly more adapted to less open environments.

Looking for the origins
 Finally, this species is also peculiar in the genera, as it is the only one that survived until the end of the Oligocene, as well as the one that may have survived for the longest time (for almost 8 Million years). We suggest that it may also be related to one other adaptation of this species: a much reduced cingulum, an enamel structure that protects it from cracks. However, there are different ways to achieve this pro-

tection, and perhaps this reduction was more cost-efficient.

Nevertheless, there are still many things to discover on *Ronzotherium*, such as where it came from before it first appeared in Europe, or why exactly did it go extinct at the end of the Oligocene, and future studies should certainly be able to look into this and bring new results.

Jérémy Tissier

Reference:

Tissier J., Antoine P.O. & Becker D. 2021. New species, revision, and phylogeny of *Ronzotherium* Aymard, 1854 (Perissodactyla, Rhinocerotidae). *European Journal of Taxonomy* 753: 1-80. <https://doi.org/10.5852/ejt.2021.753.1389>