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Press release

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Outliving the Ice Age: Tale of a Rhinoceros

Species dying out is an entirely natural process. It is a fundamental process of evolution: Survival of the fittest – the best adapted species survives. The Ice Age expert Professor Ralf-Dietrich Kahlke from the Senckenberg Research Institute, Research Station of Quaternary Palaeontology Weimar and the palaeocologist PD Dr. Thomas M. Kaiser from the University of Hamburg, Biocentre Grindel now present a study in the specialist journal Quaternary Science Reviews that shows why, after 800,000 years of successful survival of a species of rhinoceros, the Hundsheim rhino (Stephanorhinus hundsheimensis) literally suddenly and irrecoverably disappeared.

Like roe deer and red deer, rhinos were amongst the characteristic animals to inhabit Eurasia during the Ice Age. They were found across wide areas. Over the past 2.6 million years Europe has been inhabited by no less than six different types of highly varied species with vastly differing ecological requirements. There were animals that were at home on the cold steppes of the northern and mid latitudes, whilst there were also species that preferred moderate and even warm climatic conditions. Occasionally multiple species of rhinoceros appeared at the same time. Did this coexistence have consequences for any of the species? Why one species was superior to another in terms of its evolvement can be shown through palaeontological finds.

The foundations for the investigations were around 740 fossilised dental and bone remains, which originate from roughly 700,000 year old clay in Voigtstedt and gravel deposits from Süssenborn in Thuringia, which are a few millennia younger. Both dig sites reveal evidence of the Hundsheim rhinoceros, which takes its name from an Austrian fossil site. With around 4000 preparations of Ice Age rhino remains, the Senckenberg research station in Weimar possesses the most comprehensive inventory of the extinct pachyderms in Europe.

On the basis of detailed examinations of the dental wear by means of so-called mesowear analysis, it was possible to reconstruct the dietary spectrums of the two rhino groups. The favoured foods left traces on the teeth: The tooth relief changes itself in a characteristic manner, thus enabling conclusions to be drawn on what the animal ate. Whilst the Voigtstedt rhinoceros predominantly fed on soft foliage from vast forests, the tooth reliefs from the animals from Süssenborn revealed evidence of a harsh steppes diet almost entirely comprising grasses. Such greatly differing dietary spectrums demonstrate an extremely broad ecological tolerance on the part of the Hundsheim rhino. Indeed, to date it has not been possible to identify any other extinct or living animal species with a similarly broad ranging diet of vegetation. These Ice Age rhinos were in fact true survivors, who dominated the environs of the steppes as well as those of the forests for almost one million years.

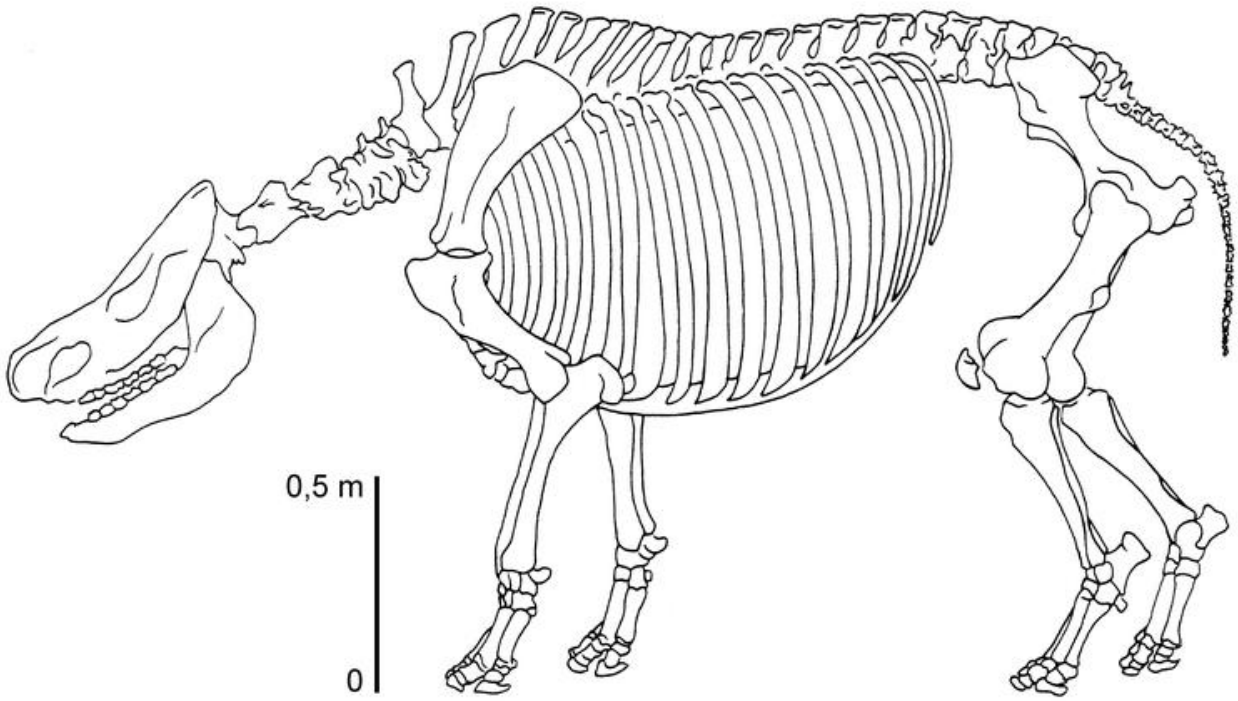
Their end came as new species of rhino developed – most likely in Asia – with an entirely different survival strategy. Around 600,000 to 500,000 years ago - during extended cold and hot periods respectively - two highly specialised types came into being, which were far more capable of processing the steppe and forest nutrition that the previously unrivalled Hundsheim rhino. Now competition had moved into all areas of its living space; the steppes and the forests. Stephanorhinus kirchbergensis, the so-called Merck's rhinoceros, began to displace the Hundsheim rhino in the forest habitats. Its anatomical characteristics show that this species was better adapted to forest habitats than the

established species. At the same time another competitor threatened the realms of the Hundsheim rhino on the open plains: Stephanorhinus hemitoechus, the steppe rhino. Remains of this species show that the animal was adapted to the nutrition found on the steppes.

The flexible lifestyle of the Hundsheim rhino allowed thousands of generations of this animal to survive. Within just a few thousand years – a brief period in the world's history – the species had become entirely extinct. Stephanorhinus hundsheimensis died out without any effective changes in the environment and entirely without the influence of early man. It was superseded by better evolved species of rhinoceros. This process can be verified by palaeontological finds. “The fact that species die out is something entirely natural” states Professor Kahlke, “although this does not give carte blanche with respect to the environmental sins of modern industry, which have caused and continue to cause the mass extinction of species such as we have never seen before”.

URL for press release: http://www.senckenberg.de

Skull remains of a female Hundsheim rhino from Thuringia with a complete set of teeth, the horns do not survive.
photo: T. Korn, Senckenberg Weimar



Skeletal reconstruction of the Hundsheim rhino based on bone remains from Thuringia
image: R.-D. Kahlke, Senckenberg Weimar