



Herbivores in the Holocene – eenie, meenie, miney, mo, and you must go!

The effects of environmental changes in the Holocene on megaherbivores are being studied

Tübingen, 09/09/2019. An international team involving Hervé Bocherens of the Senckenberg Centre for Human Evolution and Palaeoenvironment at the University of Tübingen has studied the effects of environmental changes in the Holocene on the megaherbivores, i.e., European bison, moose, and aurochs. The researchers concluded that the aurochs was unable to adapt to the altered conditions – the increasing spread of forests and humans – and therefore went extinct. The study was recently published in the scientific journal “Global Change Biology.”

Numerous large herbivores such as mammoths, giant elks, and woolly rhinoceroses did not survive the last Ice Age. “In Europe, only three of these so-called megaherbivores – European bison, moose, and aurochs – were still found in the subsequent geological epoch, the Holocene,” explains Prof. Dr. Hervé Bocherens of the Senckenberg Centre for Human Evolution and Palaeoenvironment at the University of Tübingen, and he continues, “However, only the European bison and the moose survived until today.”

The reasons for the extinction of the aurochs and the continued survival of European bison and moose have now been examined in an extensive study conducted by Bocherens in conjunction with his colleague Rafał Kowalczyk of the Polish Academy of Sciences and an international team.

“Since the onset of the Holocene about 11,700 years ago, these animals were exposed to massive environmental changes – the transition of the vegetation from open steppes to forests, on the one hand, and the increasing spread of humans, on the other,” says Bocherens.

The researchers determined the carbon-nitrogen isotope ratio in the bone collagen of 295 fossils from 14 European countries. The results show that all three species of herbivores were forced to alter their feeding habits. According to the study, the European bison was most flexible in this regard, followed by the moose. However, the aurochs with its specialized diet had a hard time coping with the changes.

PRESS RELEASE
09/09/2019

Contact

Prof. Dr Hervé Bocherens
Senckenberg Centre for Human
Evolution and Palaeoenvironment
(HEP) at the University of Tübingen
Phone 07071- 2976988
herve.bocherens@senckenberg.de

Judith Jördens

Press Office
Senckenberg Gesellschaft für
Naturforschung
Phone 069- 7542 1434
pressestelle@senckenberg.de

Publication

Hofman-Kamińska E., Bocherens
H., Drucker G.D., Fyfe R.M.
Gumiński W., Makowiecki D.,
Pacher M., Piličiauskienė G.,
Samojlik T., Woodbridge J.,
Kowalczyk R. 2019. Adapt or die -
response of large herbivores to
environmental changes in Europe
during the Holocene. *Global
Change Biology* DOI:
10.1111/gcb.14733
<https://onlinelibrary.wiley.com/doi/10.1111/gcb.14733>

Press Images



European bison in the Białowieża Forest.

Photo: Tomasz Kamiński



Measuring a European bison skull prior to sample extraction.

Photo: Tomasz Kamiński

SENCKENBERG GESELLSCHAFT FÜR NATURFORSCHUNG

Judith Jördens | Press & Social Media | Communication Staff

T +49 (0) 69 75 42 - 1434

F +49 (0) 69 75 42 - 1517

judith.joerdens@senckenberg.de

www.senckenberg.de

M+49 (0) 1725842340

SENCKENBERG Gesellschaft für Naturforschung | Senckenberganlage 25 | 60325 Frankfurt am Main

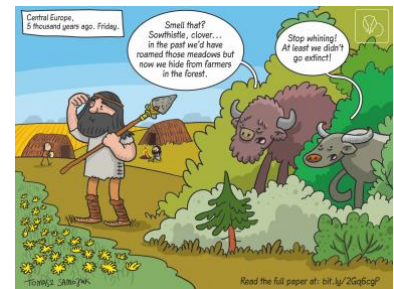
Board of Directors: Prof. Dr. h.c. Volker Mosbrugger, Prof. Dr. Andreas Mulch, Stephanie Schwedhelm, Prof. Dr. Katrin Böhning-Gaese, Prof. Dr. Karsten Wesche



Bocherens and his colleagues presume that the animals were unable to find sufficient food in the forests, and yet could not leave the woods due to the increasing hunting pressure brought about by the spread of humans. “Ultimately, this led to the extinction of the aurochs in the early 17th century,” concludes the scientist from Tübingen.

*To study and understand nature with its unlimited diversity of living creatures and to preserve and manage it in a sustainable fashion as the basis of life for future generations – that has been the goal of the **Senckenberg Gesellschaft für Naturforschung (Senckenberg Nature Research Society)** for the past 200 years. This integrative “geobiodiversity research” and the dissemination of research and science are among Senckenberg’s primary tasks. Three nature museums in Frankfurt, Görlitz, and Dresden display the diversity of life and the earth’s development over millions of years. The Senckenberg Gesellschaft für Naturforschung is a member of the Leibniz Association. The Senckenberg Nature Museum in Frankfurt is supported by the City of Frankfurt am Main as well as numerous other partners. Additional information can be found at www.senckenberg.de.*

*The **University of Tübingen** is one of eleven universities in Germany that were recognized as excellent. Within the life sciences, it provides top-of-the-line research in the fields of neurosciences, translational immunology and cancer research, microbiology and infectious disease research, as well as molecular biology. Additional research emphasis is given to machine learning, geo- and environmental research, archeology and anthropology, language and cognition, and education and media. More than 27,700 students from all over the world are currently enrolled at the University of Tübingen, where they can choose among approximately 300 study courses – from Archeology to Zoology.*



Comic on account of the new study.

Illustration: Tomasz Samojlik

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