

ICHIE

Interconnectivity of large Carnivores, Humans and Ice Age Environments

DURATION

15/12/2019 - 15/03/2022

BUDGET

179 816 €

PROJECT DESCRIPTION

Context

Over the last 120,000 years, Europe has gone through a period of climatic instability with an alternation of cold, dry phases with milder, more humid phases. The climatic fluctuations of the Last Ice Age greatly affected the environment and impacted both plant and animal communities. Humans (Neanderthals and Anatomically Modern Humans) competed with the large predators for food and habitat. Until about 40,000 years ago, Neanderthal populations lived in the karst region of eastern Belgium. During this period or shortly afterwards, the first Homo sapiens settled in Belgium. It is also during this period that the cave hyaena and the cave bear became extinct, and the cave lion disappeared, while a symbiotic interaction between humans and Pleistocene wolves began to develop. Many predators and herbivores became extinct perhaps due to a combination of the climate changes that were taking place at the time and an increasing human activity. Large amounts of bones from these fossil mammals, as well as human remains and Palaeolithic artifacts, were excavated in the Belgian caves in the 19th century by Edouard Dupont and his team. This material has since been housed in the Royal Belgian Institute of Natural Sciences (RBINS). Also, the fossils found in the Pleistocene sands in lowland Belgium, deposited by the palaeorivers of the Scheldt, Zenne and Dijle, are part of the collection of the RBINS.

General objectives and underlying research questions

The analyses of the zooarchaeological and taphonomic data of the fossil predators and their prey provide insight into the behaviours of the predators just before their disappearance and elucidate the dynamic relationship between the predators and humans in the context of a deteriorating climate. Important questions in this regard are whether Anatomically Modern Humans adapted to the changing environment in a different way than the last Belgian Neanderthals? Did their expansion affect the demographics of the large carnivores? Did Palaeolithic dogs help Modern Humans control predator populations? Did the herbivore demographics suffer from human hunting pressure? Did the predators (humans and/or carnivores) adapt to the declining populations of their prey by expanding their habitat, so that they hunted not only in the karst area of Belgium, but also in the lowlands?

Methodology

To answer these important questions, the ICHIE project focuses on the study of zooarchaeological and taphonomic data of the fossil material from Belgian prehistoric and paleontological sites and on the stable isotope analyses from a selection of this material. A number of specimens will be dated by AMS dating. These analyses are carried out in collaboration with the Royal Institute for Cultural Heritage (KIK-IRPA). The analyses of the new material from the karst area (Goyet, Trou Magrite, Caverne Marie-Jeanne) and the lowland area (Zemst, Hofstade) from Belgium and from European sites will be integrated with already published analyses of human and animal remains from this period.

Potential impact of the research on Science, Economy, Society, Culture, Environment and/or quality of life, Public policy or services, and/or management, conservation and valorisation of Federal Scientific Institution's collections

- Most Pleistocene mammal remains studied in the ICHIE project were collected from Belgian paleontological and prehistoric sites in the 19th and 20th centuries and have been preserved in the RBINS ever since and are now analysed in collaboration with the KIK-IRPA. The ICHIE project therefore makes a scientific contribution to these unique and rich collections by integrating zooarchaeological research and multi-isotope analyses, revealing the scientific and cultural value of this federal heritage. This research project, with the RBINS and the KIK-IRPA as partners, also benefits from international collaborations (follow-up committee).



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- The expertise in the field of zooarchaeology at the RBINS is reinforced thanks to the ICHIE project. In the long run, this is very important for the management, study and valorisation of the RBINS's paleontological collections. The ICHIE project, with an emphasis on the interactions between humans and nature during the Pleistocene, fits perfectly into the research priorities of the RBINS. The ICHIE project highlights the interconnectivity between predator and human populations during climatic upheavals from the Last Ice Age and may help us interpret the human-predator interactions in the present.

- Recent debates about the human ecological footprint highlight the extent to which economies today affect ecosystems. The ICHIE project contributes to the debate by mapping the early onset of human impacts on natural capital and adding a deep-time perspective to the causes of declining global biodiversity.

Description of the expected final research results (analysis tools, studies, recommendations, conferences, models, scenarios, reports, publications, etc...) and valorisation perspectives at short and medium term

- The analyses carried out by the RBINS and the KIK-IRPA show that old collections can be used to investigate scientific questions from a modern perspective. The scientific results of the ICHIE project will be published in high-impact journals, presented at international conferences and at lectures for natural and archaeological associations and citizen science groups. Three manuscripts have already been submitted, two of which are in print.

- Thanks to interviews in the general press, the general public can also become aware of the results of this study and the exceptional value of the Belgian fossil heritage. The deep-time dimension of this research can offer decision-makers a new perspective. The objectives of the ICHIE project thus encompass scientific, societal and policy benefits.



Figure 1: Map of Belgium with the sites studied in the ICHIE project



Figure 2: Cave hyena cub from Caverne Marie-Jeanne

CONTACT INFORMATION

Coordinator

Dr. Mietje Germonpré
Royal Belgian Institute of Natural Sciences
(KBIN-IRNSB)
Quaternary Environments & Humans
mgermonpre@naturalsciences.be

Partners

Dr. Mathieu Boudin
Royal Institute for Cultural Heritage (KIK-IRPA)
mathieu.boudin@kikirpa.be

LINKS

<https://www.researchgate.net/project/Interconnectivity-of-large-Carnivores-Humans-and-Ice-Age-Environments>