



Research Project

Isotopenanalysen an gut datierten Rinder- und Rothirschknochen aus neolithischen Seeufersiedlungen aus der Schweiz als Hinweis zur Geschichte der Weidewirtschaft, der Umwelt und des menschlichen Einflusses auf die Umwelt.

Third-party funded project

Project title Isotopenanalysen an gut datierten Rinder- und Rothirschknochen aus neolithischen Seeufersiedlungen aus der Schweiz als Hinweis zur Geschichte der Weidewirtschaft, der Umwelt und des menschlichen Einflusses auf die Umwelt.

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Organisation / Research unit

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Department

Project Website <https://www.i-bone.ch>

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Status Completed

Here we propose to study the changing strategies of animal management, from herding and dairying to hunting as represented in the archaeology of the Swiss lake-side dwellings. These dwellings – dated between 4300 and 800 BC – have the richest and most detailed archaeological record in Europe, and provide a unique background for the examination of models of subsistence, intensification, cultural adaptations to climatic changes and human impact to the prehistoric environment. Waterlogged deposits have preserved many organic remains such as wood, seeds, animal dung; and hundreds of thousands of animal bones have been recovered. Because of dendrochronology the archaeological finds can be dated precisely at least to decades but even to single years, allowing a longitudinal study with unprecedented time resolution. We will focus our research on the eastern area of Switzerland, especially the lake dwelling settlements of “Arbon Bleiche 3” and the lower lake Zurich region where vast and well documented archaeozoological collections exist spanning a long chronological sequence of settlements in a small and clear defined region.

The following research questions will focus on cattle economy and cattle management on one hand and human impact on red deer population on the other by means of isotope analysis:

1A. Was transhumance in use as a cattle management strategy from 4300 BC? – Was this strategy continuously in use and intensified over time? – Which areas and altitudes does it include? – Can seasonality in cattle herding be seen?

1B. Is the low intensity in cattle herding in the beginning of the “Jungneolithikum” (4300-3900 BC) reflected in the isotope patterns? – Are the herding strategies for cattle different in the Horgen Culture (3400-2800 BC) with its emphasis on pigs? – Is the appearance of a larger breed of cattle from the Corded Ware period accompanied by new herding techniques?

1C. How important was dairying which is witnessed at sites through lipid residues on pottery?

2A. Does red deer hunting become important only in times of poor climate? – How large is the catchment area of the hunting?

2B. How is the food crisis of the later 37th century BC in the lake Zurich region reflected in the isotopic patterns of domestic and hunted animals?

The outlined research questions will be addressed by using stable isotope analysis on high-crowned cattle and deer molars. Oxygen isotope ratios ($\delta^{18}\text{O}$) will be measured as a proxy for climatic alteration and evidence for herding in different altitudes. They will also provide key seasonal information (e.g. of calf birth to maintain lactation) and give a seasonal link to the spatial signals of strontium isotope data ($^{87}\text{Sr}/^{86}\text{Sr}$) that reflect the geological conditions of the feeding grounds. Strontium isotope data will be achieved through conventional TIMS and new Laser Ablation measurements. Laser Ablation MC-ICPMS allows the currently highest possible intra-tooth spatial resolution of isotope variations. Spatial assignment of the isotope information will be supported by comparative analysis of faunal teeth from supposedly local animals from archaeological contexts as well as modern water and vegetation data. Additionally, carbon ($\delta^{13}\text{C}$) and nitrogen isotope ratios ($\delta^{15}\text{N}$) will inform about environmental conditions of the pasture grounds, including density of the forest cover or humidity as well as feeding on manured agricultural plots. All data will be analysed statistically and integrated in a geographical information system (GIS) within this network project for which three different universities from three different European countries will bring in their respective expertise.

Keywords Neolithic Period, Archaeozoology, Stable Isotopes, cattle, red deer

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Add publication

Published results

3386816, Doppler, Thomas; Gerling, Claudia; Schibler, Jörg, The importance of the hinterland: Multi-isotope analysis on animals from Neolithic lakeshore settlements in the Alpine Foreland, 0965-1381, PAST : the Newsletter of the Prehistoric Society, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

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3885660, Gerling, Claudia; Doppler, Thomas; Heyd, Volker; Knipper, Corina; Kuhn, Thomas; Lehmann, Moritz F.; Pike, Alistair W. G.; Schibler, Jörg, High-resolution isotopic evidence of specialised cattle herding in the European Neolithic, 1932-6203, PLoS ONE, Publication: JournalArticle (Originalarbeit in einer wissenschaftlichen Zeitschrift)

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Document

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Specify cooperation partners

ID	Kreditinhaber	Kooperationspartner	Institution	Laufzeit - von	Laufzeit - bis
1528284	Schibler, Jörg	Heyd, Volker, Dr.	University of Bristol	01.04.2013	31.03.2016
1528289	Schibler, Jörg	Alistair W. Pike	University of Southampton	01.04.2013	31.03.2016