

A study of a possible early reindeer domestication site on the Iamal peninsula (Russia) using geoarchaeological methods and lipid biomarkers.

Loic Harrault (1,2), Karen Milek (1), Lorna Dawson (2), and David Anderson (3)

(1) Department of Archaeology, School of Geosciences, University of Aberdeen, St. Mary's, Elphinstone Road, Aberdeen AB24 3UF, Scotland, UK, (2) The James Hutton Institute, Macaulay Drive, Craigiebuckler, Aberdeen AB15 8QH, Scotland, UK, (3) Department of Anthropology, University of Aberdeen, Aberdeen AB24 4QY, Scotland, UK

In past centuries, indigenous hunters in Northern Eurasia shifted from being hunters to being herders of reindeer. Even at low human population densities, large reindeer herds can alter the landscape and leave long-term biochemical signatures in the soil. Although indigenous social-ecological systems have been thought to be resilient in space and time, most are considered to be at risk due to climate and socio-economic changes related to anthropogenic activities. This situation calls for a long-term perspective to place human-animal relations in their respective contexts. As an ancient livelihood still practiced across vast areas of Northern Eurasia, reindeer herding is a nexus for feedbacks between humans, animals and environment.

The Iarte site, on the Iuribei River in the central part of the Iamal peninsula is thought to be an important site of reindeer domestication dating back to the 12th century due to the enormous quantities of butchered reindeer bones found in recent excavations. The large amount of buried reindeer bones found at the settlement suggests that herds should have stood near the site despite the lack of any architectural remains of corrals or pens.

The history of a possible early relation to domesticate reindeer can be described with geoarchaeological methods, including lipid biomarkers, which can indicate the presence of past human and animal activities. Among lipid biomarkers, faecal markers such as stanols and bile acids have already been used in archaeological contexts to identify and distinguish between different species because they are persistent over time and can have a species specific profile.

Near the Iarte settlement, we conducted a soil survey and sampling programme and combined geoarchaeological measurements (including electrical conductivity, magnetic susceptibility and elemental analysis) with lipid analysis of soil samples, to identify the potential presence of standing reindeer herds. The different soil layers have been investigated to link these activities with past cultural layers.

The first results from the lipid analysis show the presence of faecal material in three buried soil horizons. The chemical profiles of these samples differ with their locations: i) the sample located very close to the human settlement has a human profile while, ii) the two samples located farther from the settlements have an animal profile. Apart reindeer, this area contains few other animals and especially no others which congregate together in large numbers, therefore the animal faecal material found could come from reindeer.

These results suggest that reindeer were present near this human archaeological site, which confirms the hypothesis of past herding activity. The next stage of this research is to integrate these results with other biomarkers and geoarchaeological methods. This study shows the potential of lipid biomarkers preserved in soils to better understand past human-animal interactions.