The Arctic is often seen as a biodiversity-poor region, where animal husbandry is solely based on herding of reindeer (*Rangifer tarandus*). However, in northern Europe and Siberia, also breeding of special autochthonous cattle (*Bos taurus*) and horse (*Equus caballus*) breeds has a long tradition (e.g. Northern Finncattle, Yakutian cattle, Mezen horse and Yakutian horse). The Arctic Ark project studies animal adaptation to the Arctic as a complex human-environmental process. As a result of natural and folk selection (artificial selection), reindeer and Arctic cattle and horse breeds show metabolic, morphological and reproductive adjustments. These adapted animal species and breeds have had a pivotal role in the resilience of Arctic cultures and economies.

In the project, we investigate how indigenous and non-indigenous societies raise reindeer, cattle and horse breeds in Finnish Lapland, Archangelsk and Eveno-Bytantaj in Sakha (Yakutia), Russia, and compare the adaptation of the three species. The project is a multidisciplinary study following the methods of genetics, ecology and anthropology disciplines. From tissue and blood samples collected from animals, DNA and RNA are extracted for genomics analyses. In addition, we explore in ruminant species (cattle and reindeer) the symbiosis between the host animal and rumen microbiota, important for the metabolism and survival of Arctic animals. The genetic uniqueness of northern cattle and horse breeds is investigated by comparing results of their DNA and RNA analyses with those of southern European (Portuguese) cattle and horse breeds.

Currently, the fieldwork phase is still ongoing, to sample biological materials and anthropological data. The fieldwork is done in collaboration with researchers from different disciplines in order to promote the interdisciplinary goals of the project. In addition, meetings and workshops will be organised. Genetic analyses of reindeer populations are ongoing, and the first results on the genetic diversity of Yakutian horse and northern cattle breeds have been published. So far, the genomic analyses of the Yakutian cattle have found that selection has affected genes associated with disease resistance and brain developmental processes. In the Yakutian horse, selection has affected genes operating in hair (coat) development, body size, metabolic and hormonal functions.

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