

Reconstruction of paleoclimate changes in the region where the Okhotsk culture flourished over the past 2,700 year

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The Okhotsk Culture, which is characterized by marine hunting lifestyle, is different from the culture peculiar to other regions of Japan, and thus is wrapped in many mysteries. Okhotsk culture was transformed into Tobinitai Culture around A.D. 10 century and ended. Climate change has been proposed to be one of the reasons for the demise of the culture (Onishi, 1996). However, the relationship between climate change and Okhotsk culture is not well understood because of the lack of detailed paleoclimate records in the region where Okhotsk culture prospered. In this study, we generate high-resolution paleoclimate records in the northern Hokkaido and south Okhotsk Sea over the past 2,700 years based on organic and isotope geochemical techniques in order to better understand the causal relationship between the regional climate and Okhotsk culture.

Terrestrial paleoclimate is reconstructed from a peat core collected from Sarufutsu wetland in northern Hokkaido while a paleoceanographic change in the Okhotsk Sea is derived from a marine sediment core taken from off the coast of Shari, Okhotsk Sea. We apply the hydrogen isotope ratio of plant leaf wax, as well as the mineral content to estimate the change in the hydrological cycle in terrestrial realm where the Okhotsk culture has flourished. On the other hand, SST is reconstructed from TEX₈₆ temperature proxy, while sea ice change is reconstructed from the stable carbon isotope ratio of phytoplankton derived C₁₆ fatty acid. TEX₈₆ based SST record shows that long-term cooling trend over the past 2,700 years with the rapid cooling around 800 years ago, which corresponds to the late stage of Medieval Climate Anomaly. In this presentation, we discuss the regional climatic impact on Okhotsk culture based on multiple paleoclimate records obtained from terrestrial and marine paleoclimate achieves.

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