

Using sedimentary ancient DNA to reveal postglacial recolonization patterns in Sweden

Ernst Jonsson^{a,b}, Anna Linderholm^{a,b}

^aDepartment of Geological Sciences, Stockholm University, Stockholm, Sweden, ernst.jonsson@geo.su.se; ^bCentre for Palaeogenetics, Stockholm, Sweden

The area around the lakes Siljan and Orsasjön in Dalarna, Sweden, is interesting from an archaeological point of view given the amount of pre-historic activity. The earliest evidence of human presence, derived from radiocarbon dated burnt faunal bones found at Orsandsbaden, dates back to c. 10,2 cal. ka BP. The early Holocene environment which the pioneers encountered had seen the Fennoscandian ice sheet disappear a few centuries before. As the ice sheet retracted from Fennoscandia, the recolonization of flora and fauna was initiated when the land became accessible. Plants and trees are represented in pollen and sedimentary ancient DNA (sedaDNA) records from lake cores in Sweden. However, there is no direct genetic evidence from the first early Holocene humans in the region, mainly due to an absence of osteological findings. This has left the answer to who the first colonisers were and where they came from clouded with uncertainties. It has been established that two main routes into Sweden were taken by the pioneers, one from southwest through Denmark and Norway, and one from east via Finland, but more detailed genetic information is yet to be undisclosed. Modern technology has provided the field with an updated toolbox which allows for novel approaches in order to reveal the origin and genetic profiles of the first Scandinavians, and the attention is turned towards sedaDNA. Lakes have the potential to record environmental changes and species present in the catchment area within the sediment layers. Here, we analyse newly generated sedaDNA found in lake sediments from Orsasjön, which allows us to investigate postglacial recolonisation patterns of plants and animals, including humans.