
Mesolithic resource use inferred from DNA captured in birch tar pitch

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Abstract

Ancient DNA investigations have immense potential in providing insights into early human demography and movements, but also into other species present in the proximity of human populations. In an earlier study we demonstrated the presence of human DNA in several pieces of Mesolithic birch bark pitch, most likely deriving from saliva. However, the DNA extracted and sequenced from the pieces is for a large part of non-human origin. Here we present the first results on DNA from animals and plants and discuss how these findings can be interpreted. The studied pieces of pitch derive from Huseby klev, a Mesolithic site excavated in the 1990s on the west coast of Sweden. The earliest context on the site, called the deep pit, is a transgressed layer dated to c. 8000-7500 BC and has a good preservation of organic material. Among the archaeological finds from the pit are more than 100 pieces of birch bark pitch. The forms of the pieces indicate variable ways of use, while c. 10% of them have imprints of teeth implying chewing. Many of them contain ancient DNA. Cooked food is less likely source for genetic material as DNA survives heating poorly, fresh food and other material is more likely. A clear possibility is the processing of materials in the mouth, such as softening skins and fibres by chewing. DNA from Mesolithic "chewing gums" thus yields information on both the environment and variable human activities.

Keywords: resource use, DNA, birch tar pitch, West Sweden, Huseby klev

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