



Sr isotope signatures of Austrian trees as a tool for the determination of origin of prehistoric wood

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Wood artefacts from prehistoric times have been preserved in a salt mine environment in Hallstatt, Austria, for more than 3000 years and thus present a unique archive of information on past mining industry. Certain findings are assumed to have been traded, so the finding spot is not equivalent to the growth region of the tree. Therefore, $^{87}\text{Sr}/^{86}\text{Sr}$ isotope ratio measurements have been applied to investigate the origin of these artefacts, in order to allow conclusions on trade routes.

As a basis for this, modern trees from several selected regions in Austria were analysed for their Sr isotopic ratios. The regions were chosen based on archaeological knowledge of settlements in the time period of interest and under consideration of the geological, climatic and silvicultural situation. Four tree species, which are also represented in the archaeological finds, were sampled. Thus, the first steps towards a map of Sr isotopic signatures bioavailable to different trees in Austria are presented here.

The applicability to the prehistoric findings, however, is challenged by the storage conditions with respect to inorganic contamination by the repository material. The extent of penetration of salt into the wood tissue was screened using laser ablation ICPMS. A decontamination strategy based on acid leaching was developed and successful separation of contamination and natural strontium could be achieved. This was shown by measurement of $^{87}\text{Sr}/^{86}\text{Sr}$ in leaching solutions and digests of wood using multi-collector ICPMS. The assumption of non-exhaustive removal of secondary salts was included into the evaluation by adoption of a mixing curve, which allows the mathematical extraction of biogenic Sr isotope ratios of the wood samples.