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P12: Towards a Sr isoscape of Austria for the determination of growth regions of prehistoric wood

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Wood artefacts from a prehistoric salt mine in Hallstatt, Austria, present a unique archive of information on Bronze and Iron Age mining. For instance, the geochemical signatures of growth locations are stored in the finds, though masked by contaminating minerals attributable to the storage conditions. Trade is assumed for certain archaeological finds. Consequently, analysis of the radiogenic strontium isotope amount ratio $n(^{87}Sr)/n(^{86}Sr)$ has been applied to investigate the geographic origin of these artefacts, in order to allow conclusions on trade routes.

In order to reveal the biogenic signatures of the prehistoric finds, a decontamination method based on acid leaching was developed. It enabled the separation of biogenic from diagenetic Sr. A mixing model was adopted to account for possibly incomplete removal of the latter. In addition to Hallstatt, seven regions in Austria were selected for sampling of modern trees based on known settlements in the time period of interest. The geological bedrock variability was considered within all regions for the definition of sampling spots, which resulted in a total of 26 locations. Drill cores from four tree species represented in the archaeological finds (i.e. *Picea abies*, *Abies alba*, *Fagus sylvatica* and *Quercus sp.*) were sampled upon availability. Sr isotope ratios were measured in wood digests after Sr/matrix separation using multicollector inductively coupled plasma-mass spectrometry (MC ICP-MS).

The isotopic signature of bioavailable Sr that was obtained from modern trees reflects the geological heterogeneity in Austria, which challenges the creation of an isoscape and its applicability to distinct provenance determination. Different bedrock types can be distinguished by their $n(^{87}Sr)/n(^{86}Sr)$. Furthermore, the data indicate that the isotope ratios of bio-available Sr within one geological substrate also vary strongly. The results highlight the importance to consider even small scale geological and environmental variability in a comprehensive sampling strategy for a reliable application of Sr isotope ratio analysis to the determination of origin of biogenic material.