

Reconstructing the origins and history of copper and lead mining from central Wales, UK, using palaeo-pollution records from a raised bog.

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Abstract

This paper presents records of the metal deposition close to a former metal mining area as preserved by a peatland which has accumulated in the lowland coastal zone in Borth, near Aberystwyth, Ceredigion, mid-Wales, U.K. The research objective was to explore the origins and history of metal mining and metallurgy by reconstructing a geochemical record of the pollution generated by copper, lead and zinc mining and/or metallurgical activity during the last four millennia. Two cores were extracted from Borth Bog, one from the raised ombrotrophic part of the bog, another from a minerotrophic part of Borth Bog close to the ancient copper workings at Llancynfelin. The results suggest that an early phase of copper and lead exploitation occurred at the site of Llancynfelin whilst lead enrichment occurs in the peat core taken close to the centre of Borth Bog during the Bronze Age, the Roman occupation. Whilst peat stratigraphy and nutrient status have influenced the geochemical record, it is argued that some phases of high copper and lead concentrations represent evidence of atmospheric pollution caused by mining. The results of this study provide further evidence that lead and copper are immobile in ombrotrophic peat. Furthermore, copper pollution can be detected in minerotrophic peat and the origins of copper and lead mining and metallurgy can be extended back to the Bronze Age. Zinc, however, may have suffered from post-depositional mobility.