

## Proof of lead pollution found in medieval bear

*Original article by James Urquhart. Adapted by Nina Notman.*

### Research team lays bare evidence that early mining practices caused lead accumulation in wildlife

Palaeontologists found abnormally high levels of lead in the teeth of a brown bear which lived around 1000 years ago in the Southern Carpathian Mountains in Romania. This is the earliest evidence of lead pollution accumulating in a wild animal.

Humans have processed lead and other heavy metals for millennia. In the middle ages it had a wide range of uses including in coins, roofing, pipelines and pottery glazes. There is a growing realisation that early mining and smelting practices affected ecosystems by releasing particles into the atmosphere, contaminating water and accumulating in the food chain.



Source: © Marius Robu

This bear jaw reveals lead pollution existed

### Tracing the lead

A research team discovered the bear's bones and teeth in 2011 inside a cave in the Romanian Carpathians, a region known for mining and metallurgy since the middle ages. Led by palaeontologist Marius Robu from the Emil Racoviță Institute of Speleology in Bucharest, the team analysed the trace elements in the bear's teeth as part of a project to understand cave bear diets.

The scientists observed unexpectedly high levels of lead in the dentine layers of the teeth in the bear's lower jaw. 'This discovery came as an unexpected result,' says Marius.

The bear was between five and six years-old when it died and the lead concentrations in the dentine followed a seasonal pattern across the years. The levels were higher during the bear's active months and lower when it hibernated. The seasonal fluctuations confirmed that the lead originated from the bear's diet.

### Centuries of contamination

'This study is a significant contribution to our knowledge of historical environmental pollution and its effects on wildlife, pushing back the earliest evidence of heavy metal contamination in terrestrial wildlife by several centuries,' says Florent Rivals at the Catalan Institute of Human Paleoecology and Social Evolution in Tarragona,

Spain, who was not involved in this study. 'It suggests that even before large-scale industrialisation, localised pollution was already affecting ecosystems.'

This is adapted from the article **Medieval bear's teeth shed light on historic heavy metal pollution** in *Chemistry World*. Read the full article: [rsc.li/42u2s8s](https://rsc.li/42u2s8s)