

## Enamel thickness and trace elements: a new approach to the paleonutritional study

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The paleonutrition study of ancient people mainly affects the teeth as the outer and the strongest part of the digestive tract, perfused with blood and lymphatic vessels; bring a lot of information that may be useful to understand the nourishment in the past. The aim of this study is to identify possible correlations between the thickness of the enamel and the presence of trace elements as indicators of Palaeolithic diet.

The samples came from seven different Sardinian sites dated back to the 3000 bC and 1400 AD. previously subjected to a classical anthropological study, were washed in absolute acetone and rinsed in distilled water. To calculate the amount of enamel on the teeth and its correlation with the dentin, we chose to analyse the samples with micro-CT oriented perpendicular to the occlusal plane with 360 ° rotation. For the qualitative estimation of trace elements, we used a X-ray fluorescence spectrometer.

The study on the thickness of the enamel showed that the total area is approximately uniform and varying the total area, both the area of the enamel and of the dentine proportionally vary. As regards the study of trace elements, the samples showed an almost constant presence of Zinc, Strontium and Manganese due to a diet essentially omnivorous, the enamel appears thicker in the sites where the elements found were Iron, Manganese, Zinc, Copper and Phosphorus reporting to a carnivorous diet.

The thickness of the enamel may be affected by the trace elements present in it, so it may be also related to the type of diet. A quantitative study of the elements themselves could provide, in the near future, more reliable data.

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### Keywords

Trace elements; enamel; paleonutrition; micro-CT; X-ray.