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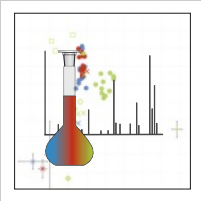

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Dietary Changes in Bronze Age Switzerland

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Keywords: Bronze Age • Farming • Human diet • Prehistory

Stable isotope analyses applied to archaeological remains allow to reconstruct aspects of prehistoric human lifestyle that were completely inaccessible until recently. Particularly, carbon, nitrogen, and sulfur stable isotopes from cereal and legume seeds ($\delta^{13}C$, $\delta^{15}N$), animal bone collagen ($\delta^{13}C_{coll}$, $\delta^{15}N$, $\delta^{34}S$), human bone and dentin collagen ($\delta^{13}C_{coll}$, $\delta^{15}N$, $\delta^{34}S$), and tooth enamel ($\delta^{13}C_{enamel}$) provide essential information in the reconstruction of human diet, mobility, and subsistence strategies.

The analysis of carbon isotopic ratios ($\delta^{13}C$) allows to distinguish the environment where humans acquired their resources (terrestrial vs aquatic) and notably the type of plants consumed: C_3 type plants (wheat, barley) are typical of a temperate environment, whereas C_4 type plants (millet, sorghum) usually reflect an open and warm environment. The nitrogen isotopic ratios ($\delta^{15}N$) detect the trophic level occupied by an organism within a food chain: plants present lower values than animals and humans that, as consumers, show higher nitrogen ratios. The sulfur isotopic ratios ($\delta^{34}S$) provide information on the origin of food sources – from a terrestrial, marine, or freshwater ecosystem – and contribute to detect human mobility.

In this study we considered three cemeteries located on the Lake Geneva Basin and dated from the Early to the Late Bronze Age (2200–800 BC). Our results show that these human groups mainly consumed terrestrial foodstuffs, despite the proximity of Lake Geneva. Furthermore, a change in the main staple crops along the Bronze Age is highlighted due to the transition from a diet mainly based on C_3 plants during the Early (2200–1500 BC) and Middle/Recent (1500–1100 BC) Bronze Age to the significant consumption of C_4 plants at the Final Bronze Age (1100–800 BC). The millets, first domesticated in China, are more resistant to aridity and were cultivated in Switzerland especially from the 11th century BC onwards. They could have contributed to the prosperity of the Late Bronze Age. Dietary differences according to sex, age-at-death or graves goods were not detected. Moreover, soil fertilization seems to have been increased along the Bronze Age, suggesting changes in agriculture strategies.

The use in archaeology of techniques from the natural sciences, such as chemistry, contributes significantly to our knowledge of the human way of life in the past.

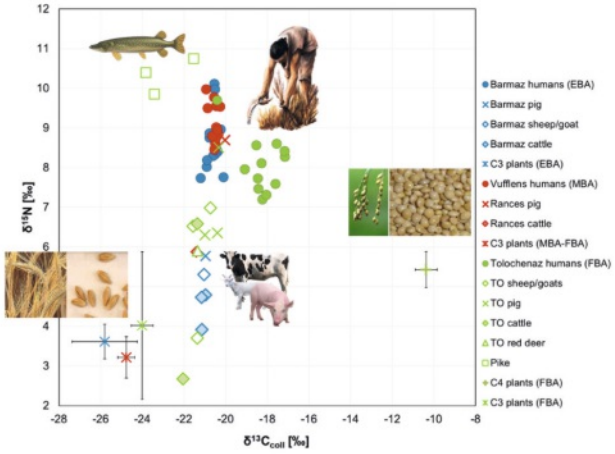

Fig. 1. Scatter plot of $\delta^{13}C$ and $\delta^{15}N$ bone collagen values for humans, animals, and botanical remains according to their chronological periods (C_3 plants include wheat and barley, C_4 plants include broomcorn and foxtail millet; representation of mean and sd for the plants). TO = Chens sur Léman, Tougues. EBA = Early Bronze Age, MBA = Middle Bronze Age, FBA = Final Bronze Age.

Fig. 2. Tolochenaz (Vaud) La Caroline. Map of the Final Bronze Age (1050–800 BC) cemetery with indication of funerary rituals, grave goods, sex/gender, class age, and sampled individuals.

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Reference

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