

## Abstract

# Isotopic Fingerprinting: A Promising Tool for Coffee Authenticity Checks <sup>†</sup>

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**Abstract:** Almost every physical or chemical process in nature favors certain light stable isotopes over others, and thereby leaves an isotopic “fingerprint” on the substances involved. Prominent examples are the evaporation and condensation of water, which act together to produce a global “map” of hydrogen and oxygen isotopes in rainwater. Environmental parameters including humidity and soil fertility influence the stable isotope compositions of carbon and nitrogen in plant tissues. Therefore, every agricultural product carries isotopic information regarding its geographical origin, growing conditions, treatment and others. This makes stable isotope analysis a powerful tool for disclosing food authenticity and to applying quality checks to a number of products (e.g., wine, honey, and vanilla). Here we recapitulate the principles of stable isotope analysis in general as well as some applications to coffee from the literature and present our recent measurements of carbon, nitrogen, hydrogen and oxygen isotopes on a well defined set of coffee samples.

**Keywords:** coffee authenticity; stable isotope analysis



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