



The IRHUM database - bioavailable strontium isotope ratios of France for geochemical fingerprinting

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Strontium isotope ratios ($^{87}\text{Sr}/^{86}\text{Sr}$) are used as a geochemical tracer in a wide range of fields including archaeology, ecology, soil, food and forensic sciences. These applications are based on the principle that strontium isotopic ratios of materials reflect the geological sources of the strontium, which were available during its formation. Geologic regions with distinct strontium isotope ranges, which depend on their age and composition, can be differentiated. A major constraint for current studies is the lack of robust reference maps to evaluate the strontium isotope ratios measured in the samples.

The aim of the IRHUM (isotopic reconstruction of human migration) database is to provide a reference map of bioavailable strontium isotope ratios for continental France. The current dataset contains 400 sample locations covering the major geologic units of the Paris and Aquitaine Basin, the Massif Central, and the Pyrenees. At each site soil and plant samples have been collected to cover the whole range of strontium ratios at a specific location. The database is available online at www.rses.anu.edu.au/research-areas/archaeochem and contains the bioavailable strontium isotope data as well as major and trace element concentrations for soil and plant samples. Strontium isotopes were analysed using a Neptune multi-collector inductively-coupled plasma mass spectrometer (MC-ICP-MS) and elemental concentrations with a Varian Vista Pro Axial ICP-AES (inductively-coupled plasma atomic emission spectrometer). In addition, IRHUM provides spatial context for each sample, including background geology, field observations and soil descriptions. This metadata allows users to evaluate the suitability of a specific data point for their study.

The IRHUM database fills an important gap between high resolution studies from specific sites (e.g. archaeological sites), to the very broad geochemical mapping of Europe. Thus it provides an excellent tool to evaluate the regional context of a sample and complement more closed spaced studies.

New results will be added to the database continuously with the aim of covering all major geologic units of France within the next year.