



21st Annual RACI Environmental and Analytical Division R&D Topics Conference

The Australian National University

11th – 13th December, 2013



The IRHUM database - bioavailable strontium isotope ratios of France for geochemical fingerprinting in archaeology and forensic sciences

Malte Willmes¹, Linda McMorrow¹, Leslie Kinsley¹, Richard Armstrong¹, Maxime Aubert^{1,2}, Stephen Eggins¹, Christophe Falguères³, Bruno Maureille⁴, Ian Moffat^{1,5}, Rainer Grün¹

¹The Australian National University, Research School of Earth Sciences, Canberra 0200, ACT, Australia,

²University of Wollongong, School of Earth and Environmental Sciences, Centre for Archaeological Science, Wollongong 2522, NSW, Australia

³Département de Préhistoire, Muséum National d'Histoire Naturelle, Paris

⁴University of Bordeaux, CNRS, MCC, PACEA UMR5199 F-33400 Talence, France

⁵Flinders University, Department of Archaeology, Adelaide, 5000, SA, Australia

Email: malte.willmes@anu.edu.au

Phone: +61 0405183783

Strontium isotope ratios ($^{87}\text{Sr}/^{86}\text{Sr}$) determined from human and faunal remains can be used to reconstruct mobility and migration. This application is based on the principle that the Sr isotopic composition of skeletal remains (teeth, bones) reflects the dietary sources of Sr available during their formation. Sr isotopic ratios vary between different geological units depending on their age and composition. These Sr isotopes enter the soils, plants, rivers and the food cycle without fractionation forming a direct link between the food chain and the underlying geology.

A major constraint for current studies both in archaeology and forensic sciences is the lack of robust reference maps to evaluate the strontium isotope ratios measured in the skeletal remains. The aim of the IRHUM (isotopic reconstruction of human migration) database is to provide a reference database of the bioavailable strontium composition for continental France. The dataset consist of results for plant and soil samples collected from 830 sample locations, covering the major geologic units of France. It is freely available through the IRHUM database web application (irhumdatabase.com), which enables users to explore and map our dataset, as well as add and share their own data.