Late Ediacaran organic matter characterization in South China

F. CAÑADAS[1]*, G. SHIELDS[1], D. PAPINEAU[1], M. ZHU[2], M. J. LENG[3]

[1]Department of Earth Sciences, University College London, London, UK (*correspondence: fuencisla.canadas.16@ucl.ac.uk)
[2]Nanjing Institute of Geology and Palaeontology, Chinese Academy of Sciences, Nanjing 210008, China
[3]NERC Isotope Geoscience Facilities, British Geological Survey, Nottingham, UK

The Shuram anomaly is a worldwide event that represents a significant shift in carbonate with negative $\delta^{13}C$ value. It took place during the Late Ediacaran (c. 570 - 550 Ma) and reached values down to −12‰ [1]. The most accepted hypothesis suggests the existence of a huge pool of dissolved organic carbon (DOC), which became progressively remineralised due to episodic oxygenation of the deep ocean [2]. However, the origin of this DOC and its significance for the co-evolution of the C and N biogeochemical cycles are still poorly understood.

Precambrian organic matter research is highly challenging, impacted by strong limiting factors such as age, type of organic matter and, more importantly, preservation conditions and/or subsequent diagenetic/metamorphic alteration, which may hinder the recovery, to a greater or lesser extent, of original bio-signatures.

Here, organic-rich shales deposited during the Shuram anomaly on the Yangtze platform (South China), are studied in order to determine the factors influencing their formation, i.e. primary productivity versus preservation. New N and organic C compositions are present in a high resolution stratigraphic context, and used as robust tracers of nutrient source, availability and cycling. Raman spectroscopy is also used to characterize the crystallinity and molecular composition of the organic matter. These new data, linked to fluctuating redox conditions during the Late Ediacaran, will provide valuable information 1) to better understand the existing global chemostratigraphic framework, 2) to reconstruct the spatial and temporal evolution of paleoproductivity at basin scale and 3) to assess the evolution and impact of the DOC reservoir.

[1] Le Guerroue *et al*. (2006) Terra Nova, **18**, 147–153.
[2] Rothman *et al.* (2003) PNAS, **100**, 8124–8129.