Geophysical Research Abstracts
Vol. 19, EGU2017-14602-1, 2017
EGU General Assembly 2017

The speleothem record from Sicily, an important palaeoclimate testimony in the heart of the Mediterranean: overview of current research

Michael Deininger (1), Marco Vattano (2), Frank McDermott (1), Silvia Frisia (3), Andrea Borsato (3), Norbert Frank (4), Christoph Spötl (5), Denis Scholz (6), Cipriano Di Maggio (2), and Giuliana Madonia (2)

(1) UCD School of Earth Sciences, University College Dublin, Belfield, Dublin 4, Ireland (michael.deininger@ucd.ie), (2) Dipartimento di Scienze della Terra e del Mare, Universita' degli Studi di Palermo, Via Archirafi 20/22, 90123 Palermo, Italy, (3) Environmental and Climate Change Research Group, School of Environmental and Life Sciences, The University of Newcastle, Callaghan NSW 2308, Australia, (4) Institute of Environmental Physics, Heidelberg University, Im Neuenheimer Feld 229, 69120 Heidelberg, Germany, (5) Innsbruck Quaternary Research Group, University of Innsbruck, Innrain 526020 Innsbruck, Austria, (6) Institute for Geosciences, Johannes Gutenberg University Mainz, J.-J.-Becher-Weg 21, D-55128 Mainz, Germany

Sicily is located in the heart of the Mediterranean and takes a strategic position between the western and eastern Mediterranean as well as between northern Africa and continental Europe. It is a place of a diverse and great cultural heritage that goes back many thousands of years; it had been colonised by Phoenicians, Carthaginians, Greeks and Romans in Ancient times and served as a trading post and granary – the latter particularly for the Romans.
Climate change scenarios studies suggest that Mediterranean ecosystems could change into deserts as a consequence of shifting temperature and precipitation patterns unparalleled in the Holocene period (Guiot and Cramer, 2016). It is, therefore, essential to shed light on past precipitation changes to gain knowledge on the timing, dynamics and causes of these changes by making use of natural environmental archives (such as speleothems). This information is not only important for palaeoclimate data-model comparisons but can also give archaeologists a wealth of information when studying cultural transformations. Speleothems are valuable natural archives of past climatic and environmental conditions on the continents. Major strengths include their suitability for accurate U-series age determinations and their preservation of multiple quasi-independent climate proxies – that can be linked to precipitation changes. Hence, speleothems proxy time series from the Mediterranean can be regarded as an important testimony of past environmental and climate changes (including precipitation) that allow to provide answers to the aforementioned questions.

Here we present first result of ongoing speleothem research on Sicily, with focuses on Pietrazzi cave (Grotta dei Pietrazzi) located west of Palermo. It developed in limestone (limestone consisting of bioclastic packstone/wackestones, fore reef coral rudstones (calcirudite) and calcarenites.) of the Calcare di Piano Battaglia Formation. Pietrazzi cave is more than 600 m in length and has a depth of roughly 90m. We will show preliminary analysis of three stalagmites (PZ-1, PZ-2, PZ-3) including U-Th age models and stable oxygen and carbon isotope data of PZ-1.

Guiot, J., and Cramer, W.: Climate change: The 2015 Paris Agreement thresholds and Mediterranean basin ecosystems, Science, 354, 465, 2016.