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A MIS 9/ MIS 8 speleothem record of hydrological variability from Macedonia (F.Y.R.O.M.)

Eleonora Regattieri[1,2, 3,*],Giovanni Zanchetta[1,4], Ilaria Isola[4], Petra Bajo[5], Chiara Boschi[3], Natale Perchiazzi[1], Russell N. Drysdale[5,6], John C. Hellstrom[7], Alexander Francke[2,8,] Bernd Wagner[2],

*corresponding author, eleonora.regattieri@unipi.it

[1]Dipartimento di Scienze della Terra, University of Pisa, Via S. Maria 53, 56126, Pisa Italy

[2]Institute of Geology and Mineralogy, University of Cologne, Zülpicher Str. 49a, 50674, Cologne, Germany

[3]Istituto di Geoscienze e Georisorse IGG-CNR, Via Moruzzi 1, 56126, Pisa, Italy

[4]Istituto Nazionale di Geofisica e Vulcanologia INGV, Via della Faggiola 32, 56126, Pisa Italy

[5]School of Geography, University of Melbourne, Victoria 3010, Australia

[6]EDYTEM, UMR CNRS 5204, Université de Savoie-Mont Blanc, 73376 Le Bourget du Lac cedex, France

[7]School of Earth Sciences, University of Melbourne, Victoria 3010 Australia

[8]School of Earth and Environmental Science, University of Wollongong, NSW 2522, Australia

Abstract

The period corresponding to Marine Isotope Stages 9 (MIS 9) offers the opportunity to study orbital and sub-orbital scale climate variability under boundary conditions different from those of better studied intervals such as the Holocene and the Last Interglacial. Yet, it is poorly represented in independently-dated continental archives around the Mediterranean Region. Here, we present a speleothem stable isotope record ($\delta^{18}O$ and $^{\delta 13}C$) from the Former Yugoslavian Republic of Macedonia (F.Y.R.O.M., southern Balkans), which consists of two periods of growth broadly covering the ca. 332 to 292 ka and the ca. 264 to 248 ka intervals (MIS 9e-b and late MIS 8). We interpret the speleothem $\delta^{18}O$ as mostly related to regional hydrology, with variations that can be interpreted as due to changes in rainfall amount, with higher/lower values associated to drier/wetter condition. This interpretation is corroborated by a change in mineralogical composition between aragonite and calcite at ca. 328 ka, which marks increasing precipitation at the onset of MIS 9 and occurs within a trend of decreasing $\delta^{18}O$

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