



Holocene climate variability from Rio Martino cave (Western Alps, Northern Italy)

Eleonora Regattieri (1,5), Giovanni Zanchetta (1,2,5), Ilaria Isola (2), Russell Drysdale (3), John Hellstrom (4), luigi Dallai (5), Ilaria Baneschi (5), and Federico Magri (6)

(1) Dipartimento di Scienze della Terra, University of Pisa, Pisa, Italy, (2) Istituto Nazionale di geofisica e Vulcanologia, Sezione di Pisa, Pisa, Italy, (3) School of Earth Sciences, University of Melbourne, Victoria 3010, Australia, (4) Department of Resource Management and Geography, University of Melbourne, Australia, (5) IGG-CNR, Institute of Geosciences and Earth Resources, Pisa, Italy, (6) Associazione Gruppi Speleologici Piemontesi

The Alpine region currently experiences complex climatic conditions (Efthymidias et al., 2007). Such a complexity is also apparent during the Holocene, as revealed by the isotopic composition of speleothems (e.g. Spötl et al., 2010). However, virtually no speleothem data are available from the western Alps, which are dominated by North Atlantic synoptic systems. With this in mind, several flowstone cores were retrieved in Rio Martino Cave (Piemonte, Northern Italy, ca. 1530 m asl). A large part of the cave's catchment was substantially glaciated until the end of the Younger Dryas. U/Th dating of three different flowstones indicates that deposition started at the beginning of the Holocene and covered a thick deposit of cemented sand and gravels probably related to the last deglaciation. The combined $\delta^{18}\text{O}$ record of different flowstones shows substantial variability through the Holocene, both on millennial and century time scales. Relatively low $\delta^{18}\text{O}$ values last until ca. 6 ka. From 6 to 3 ka, the $\delta^{18}\text{O}$ increases gradually before decreasing again from 3 ka to the present. This long-term trend may be related to changes in the seasonal patterns of precipitation, as suggested for the lake level record at Ledro (Magny et al., 2012). Superimposed on this trend there are several short-term oscillations which may reflect alternating periods of drier and wetter conditions. Some of these episodes are also in agreement with changes documented at Ledro.

Efthymidias D., et al., 2007. Influence of large-scale atmospheric circulation on climate variability in the Greater Alpine Region of Europe. *Journal of Geophysical Research*, 112, D12104.

Magny M. et al., 2012. Holocene palaeohydrological changes in the northern Mediterranean borderlands as reflected by the lake-level record of Lake Ledro, northeastern Italy. *Quaternary Research*, 77, 382–396

Spötl, C., et al., 2010. Humid climate during deposition of sapropel 1 in the Mediterranean Sea: Assessing the influence on the Alps. *Global and Planetary Change* 71, 242-248.