

## **The stable isotope record of vermetids from the Eastern, Central and Western Mediterranean basins during the past two millennia.**

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High-resolution  $\delta^{18}\text{O}$  and  $\delta^{13}\text{C}$  records obtained from cores drilled from ledges of the reef builder gastropod *Dendropoma petraeum* were used to calibrate the isotopic signals and to reconstruct variations of sea surface temperature, hydrology and productivity during the past 2000 years in the Levantine, Central and Western basins of the Mediterranean. The  $\delta^{18}\text{O}$  of the aragonite shell of living vermetids indicates that skeletal deposition occurs under isotopic equilibrium and faithfully records the temperature and surface water  $\delta^{18}\text{O}$  during spring and summer. The vermetid  $\delta^{13}\text{C}$  is strongly related to  $\delta^{13}\text{C}$  of dissolved inorganic carbon and to the primary productivity of the surface water. Data will be presented from cores drilled along the coasts of Israel, Crete, Sicily, Tunisia and Spain. The mean down core  $\delta^{18}\text{O}$  record clearly captures global and local climatic events, such as the Little Ice Age (LIA) and the recent warming of surface waters in the Eastern Mediterranean. The  $\delta^{18}\text{O}$  records of the three basins are synchronous between 600 and 1750 AD but decouple at around 1750. While the Eastern Mediterranean shows a clear warming trend the Central and the Western basins show a different thermal behavior. On the other hand, the carbon isotopic composition of the 3 basins is similar, showing  $\delta^{13}\text{C}$  depletion during the last century which is mostly related to the increased anthropogenic emissions of  $^{13}\text{C}$  depleted carbon dioxide and to a certain decrease in primary production. The data indicate that *D. petraeum* isotopic signatures are unique proxies for the last two millennia for high-resolution reconstruction of paleo-oceanographic environments in the Mediterranean and the sub-tropical Atlantic regions.