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Ostracods in Lake Geneva (Switzerland): a study of the autoecologic, morphometric, and geochemical composition of live species.

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Stable isotope composition and Mg/Ca or Sr/Ca of ostracod fossil valves have proven to be useful for a reconstruction of palaeoenvironmental conditions in continental areas. Such methods have been used over the past decades with variable success, where this variability is related to a lack of knowledge on the extent of isotopic fractionation for oxygen and carbon and the trace element partitioning during valve calcification. Both natural and laboratory cultures showed that ostracod valves do not crystallise in equilibrium and that the offset observed between predicted and measured values is species specific and may vary from one location to the other. Many factors, including the chemical and isotopic composition of water, its temperature, pH, and biological controls are believed to influence the geochemistry of the valves. It is the aim of this study to understand the control on the geochemistry of ostracod valves, as this is of critical importance for their use for past climatic and environmental interpretations. To achieve this, the environmental parameters and water chemistry are being measured at sites where living ostracods are sampled over the course of one year at one-month intervals at five different water depths (2, 5, 13, 33, and 72 m) in Lake Geneva. In addition to measurements of the trace element and isotopic composition of the ostracod valves, the temperature, pH, dissolved oxygen, as well as major and trace element content, and C- and O-isotope composition of water, including interstitial pore waters, are being measured.

The one-year sampling provides autoecological data for 15 ostracod species. Bathymetric distribution, life cycles and habitats could be determined for these species and are predominantly related to water temperature and sediment texture. Water chemistry and isotopic composition varies seasonally, following water temperature and lake productivity. This unique environmental dataset provides a solid base to interpret the geochemistry of valves sampled during the year. First results show that the oxygen isotopic composition of ostracod valves in Lake Geneva reflects that of water and is dependant on temperature. However, strong offsets of up to 3 permil between the ostracod oxygen isotopic composition and a theoretical calcite that crystallised at equilibrium are observed. Yet, fractionation factors determined for some species in Lake Geneva are in good agreement with those determined by Keating et al. (2001). Surprisingly, results from these two studies do not match previous results for Lake Ammersee and Starnberger See (von Grafenstein et al., 1999), suggesting that other factors (abundance of carbonate species, hardness of water, etc.), could affect the oxygen isotope composition of ostracod valves. Morphometry and measurements of major and trace element content are still in progress, and may help to place constraints on such factors.

Keatings et al. (2001). *Geochim. Cosmochim. Acta* **66**(10), 1701-1711.

von Grafenstein et al. (1999). *Palaeogeo., Palaeoclim., Palaeoecol.* **148**, 133-152.