Variability in the partition coefficients for Mg and Sr in the shells of the ostracod “Heterocypris salina” from culture experiments

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The partition coefficients of trace elements in ostracod shells (KdMe = Me/Ca_{valve} / Me/Ca_{water}, in molar ratios), mainly for Mg and Sr, have been widely used for the reconstruction of paleoenvironments. In order to settle these coefficients for Heterocypris salina, juvenile individuals of this ostracod species were grown up to the adult stage in culture experiments in 5 waters with a wide range of hydrochemistry (Mg/Ca_{w} range from 0.5 to 12, Sr/Ca_{w} range from 0.005 to 0.02), conductivity (1-17 mS/cm) and at 4 constant temperatures (18, 20, 25, 28°C). From our experiments, Mg/Ca and Sr/Ca molar ratios of the valve calcite are directly related to the Mg/Ca and Sr/Ca of the water respectively, and to the temperature of the water (T_{w}). In the case of Mg/Ca the temperature change has equal effect in the whole studied range of Mg/Ca_{w}, whereas for the Sr/Ca the temperature effect is greater at high Sr/Ca_{w}. Moreover, Mg/Ca in the valve calcite has a good correlation to the [Mg] in water. KdMg displays very high and diverse values (0.004-0.016) at low Mg/Ca_{w} (< 2). At high Mg/Ca_{w}, KdMg displays small variations, and its dispersion can be explained by the T_{w}: the higher the T_{w}, the higher the value of the coefficient for a given Mg/Ca_{w}. Neither the conductivity nor the [Ca] in water appear to have a clear effect on the KdMg. KdSr values are nearly constant, but they increase slightly with the Sr/Ca_{w} and with the T_{w}. Other water parameters such as conductivity, [Sr], [Ca], or Mg/Ca_{w}, do not seem to have effect on the KdSr.

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