422

STABLE ISOTOPE RATIOS IN ECOSYSTEM COMPONENTS CAN PROVIDE EVIDENCE FOR CLIMATE CHANGE

A.H.L. Huiskes[1], T.C.W. Moerdijk[1], N. Cannone[2], H. Peat[3]

[1]Netherlands Institute of Ecology, Yerseke, Netherlands, [2]University of Milan Bicocca, Milan, Italy, [3]British Antarctic Survey, Cambridge, United Kingdom

The oxygen stable isotope ratio ($\delta^{18}O$) of the organic matter of an organism, such as *Usnea antarctica* depends mainly on temperature and on the $\delta^{18}O$ of the water source, which varies with latitude (and is hence co-correlated with temperature).There is usually a strong temperature signal in the oxygen stable isotope ratios of material sampled along a latitudinal gradient.

Vice versa, if the local temperature changes over time, it should be possible to detect this change in the $\delta^{18}O$ of samples collected over a certain time period.

Samples of *Usnea antarctica* were collected in various locations in Antarctica. For time series herbarium specimens were used, collected at Signy Island and in the Argentine Islands.

The trend in the $\delta^{18}O$ values of the *Usnea* along the latitudinal gradient is strongly proportional to the temperature decrease along that same gradient. This proves that the Oxygen stable isotope ratios are co-correlated with temperature.

Samples collected over a number of years on the same location, show similar trends in $\delta^{18}O$ ratios as the Mean Annual Temperature in these locations.

The conclusion is that temperature trends in the past can be reconstructed from herbarium material.