Analysis of Sr and Pb isotope ratios in wine by MC-ICP-MS

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A method has been developed for high precision analysis of Pb and Sr isotope ratios in wine. The method involves microwave digestion of wine, separation of Pb and Sr from the matrix using a single ion exchange column, and analysis of isotope ratios using a Neptune MC-ICP-MS. We will present the experimental details and preliminary data for an EU wine standard. We will also discuss the precision and accuracy of the isotope ratio measurement. The method has potential applications in areas such as food and beverage authentication. In recent years, more and more faked Canadian ice wines have been marketed overseas, which has become a serious trade issue. Isotope ratios, such as Sr and Pb isotopes, are potentially a powerful tool to distinguish foods and beverages from different geographic regions, due to the differences in soil and water chemistry of the regions, where the produce is grown.

Lipid biomarker reconstruction of phytoplankton productivity in the northern Okinawa Trough during the last 92 kyr

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Biomarkers have been widely used to reconstruct phytoplankton productivity and community structure changes, and this method has been applied in the northern Okinawa Trough of the western Pacific. We report 92 kyr high-resolution molecular records of alkenones, brassicasterol, dinosterol and *n*-alkanols in core CSH-1 ($31^{o}13.73'$N, $128^{o}43.37'$E; 703 m water depth). The alkenone sea surface temperature record shows a glacial-interglacial change of 4°C, consistent with previous results. Haptophyte productivity, as indicated by alkenone content, reveals a general decreasing trend for the last 92 kyr, however, haptophyte productivity was slightly higher during the glacial than during the interglacial, for example, MIS 4 was higher than MIS 3 while MIS 2 was higher than the Holocene. Diatom and dinoflagellate productivities, as indicated by brassicasterol and dinosterol content respectively, generally co-vary and reveal a clear glacial-interglacial pattern with higher values during the glacial. The increased productivity during the glacials was likely caused by the stronger winter monsoon. Also contributing to the higher productivity was increased nutrient supply from terrestrial sources due to lower sea-level, which is consistent with higher terrestrial biomarker (*n*-alkanols) content. Phytoplankton community structure reconstruction, represented by the biomarker ratios, indicates that the haptophyte contribution reached a maximum during MIS 5a and decreased significantly from 80 ka to 60 ka. Phytoplankton community structure remained relatively stable during the last 60 kyr.