Normalization of sedimentary lipid biomarker concentrations to total organic carbon in principal component analysis.

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Abstract

The objective of this study is to demonstrate the importance of normalizing lipid biomarker concentrations in sediment to total organic carbon (TOC) for principal component analysis (PCA) by using n-alkanols and aliphatic hydrocarbons in marine sediments collected from the East China Sea shelf off northern Taiwan. In performing PCA, logarithmically transformed data and z-score function transformed data along with the raw data were compared with TOC normalized data. Results show that the positions of n-alkanol variables in the loading plot using TOC normalized data are in good agreement with the organic geochemical knowledge in terms of sources. For aliphatic hydrocarbons, the positions of samples in the score plot using TOC normalized dataare different from those using the raw data and z-score function transformed data. It is suggested that normalization of lipid biomarker concentrations with TOC be taken into consideration in performing PCA when the grain size distributions of sediments in a study area vary in a wide range.