Application of factor analysis in geochemical fractions of heavy metals in the surface sediments of the offshore and intertidal areas of Peninsular Malaysia.

Abstract

In this study, heavy metal data (including four geochemical fractions) from offshore and intertidal sediments collected off the west coast of Peninsular Malaysia were analyzed using factor analysis. A similarity was found when comparing between offshore and intertidal sediments, where out of the 20 variables, five factors (resistant Cu, total Cu, resistant Pb, total Pb and total Zn) could be clearly selected on the basis of their high loadings as derived by factor analysis in both sediment sampling areas. However, the statistical outputs based on the present study using factor analysis cannot be practically acceptable mainly because the resistant fractions are not of anthropogenic origins and ecotoxicologists are more concern on the anthropogenic ones. Only a modification using a specific normalizing agent such as the nonresistant fraction, should be tested to show feasibility of the contribution of anthropogenic sources in the two sampling areas. However, a more comprehensive metal monitoring data should be compiled to complement the results obtainable from factor analysis, before a valid Malaysian Marine Sediment Pollution Index or Sediment Quality Guidelines, can be proposed to be established.

Keyword: Factor analysis; Metals in sediment; Peninsular Malaysia.