

Spatial and temporal trends of polycyclic aromatic hydrocarbons in sediment cores of Brunei Bay, East Malaysia

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ABSTRACT

The spatial and temporal distribution of polycyclic aromatic hydrocarbons (PAHs) in three sediment cores from Brunei Bay, Southern South China Sea was investigated. The total concentrations of 16 priority PAHs (ΣPAH_{16}) and their alkyl-substituted derivatives ranged from 10.4 to 376 ng g⁻¹ and 30.7 to 2263 ng g⁻¹, respectively. PAH biomarker diagnostic ratios and principal component analysis (PCA) combined with absolute principal component score (APCS) and multiple linear regression (MLR) were performed to apportion the source contribution. The results revealed mixed inputs of fuel combustion residues and uncombusted petrogenic products. The downcore PAH profile revealed that the highest peaks could be related to past human activities using biofuel and coal during the industrialization/agriculture revolution period. The 1,7/(2,6+1,7)-dimethylphenanthrene ratio also highlighted wood combustion during forest fire outbreaks, which appeared to coincide with the past climate events.

KEYWORDS

Diagnostic ratios; PAHs; PCA-APCS-MLR; Wood combustion

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