COMPOSITIONAL PROFILES OF POLYCYCLIC AROMATIC HYDROCARBONS IN HIGHER PLANTS USING MULTIVARIATE ANALYSIS TECHNIQUES

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Thirty six higher plants sampled from oil exploration sites in Niger Delta, Nigeria were analyzed with gas chromatography–mass spectrometry to determine the occurrence, distribution and compositional profiles of polycyclic aromatic hydrocarbons (PAHs). The 28PAH ranged from 335 to 3094 ng/g. Higher PAHs concentrations were observed in the plants when compared with the soils and sediments concentrations with predominance of 2 and 3 ring PAHs. Multiple linear regression (MLR) and principal component regression (PCR) were used in predicting the soil PAHs concentrations based on the concentrations of PAHs obtained in plant species collected from the same locations, the results showed that non woody plants gave more reliable predictions. The Principal Component Analysis (PCA) shows the plants in all the locations do not maintain a particular pattern in their total PAHs concentrations. The differing physiological characteristics and maturity in the plants could be responsible for the observed patterns. Similarly, the PCA recognised three main clusters in the PAHs distribution among the plant samples from all locations; the distinct dissimilar molecular masses, density and solubility might be responsible for the observed pattern exhibited by the PAHs.

Keywords: higher plants, polycyclic aromatic hydrocarbons, principal component analysis