

## Comparative Correlation Investigation of Polynuclear Aromatic Hydrocarbons (PAHs) in Soils of Different Land Uses: Sources Evaluation Perspective

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**Abstract :** Polycyclic Aromatic Hydrocarbons (PAHs) are formed mainly as a result of incomplete combustion of organic materials during industrial, domestic activities or natural occurrence. Their toxicity and contamination of terrestrial and aquatic ecosystem have been established. Though with limited validity index, previous research has focused on PAHs isomer pair ratios of variable physicochemical properties in source identification. The objective of this investigation was to determine the empirical validity of Pearson correlation coefficient (PCC) and cluster analysis (CA) in PAHs source identification along soil samples of different land uses. Therefore, 16 PAHs grouped as endocrine disruption substances (EDSs) were determined in 10 sample stations in top and sub soils seasonally. PAHs was determined the use of Varian 300 gas chromatograph interfaced with flame ionization detector. Instruments and reagents used are of standard and chromatographic grades respectively. PCC and CA results showed that the classification of PAHs along kinetically and thermodynamically-favoured and those derived directly from plants product through biologically mediated processes used in source signature is about the predominance PAHs are likely to be. Therefore the observed PAHs in the studied stations have trace quantities of the vast majority of the sixteen unsubstituted PAHs which may ultimately inhabit the actual source signature authentication. Type and extent of bacterial metabolism, transformation products/substrates, and environmental factors such as: salinity, pH, oxygen concentration, nutrients, light intensity, temperature, co-substrates and environmental medium are hereby recommended as factors to be considered when evaluating possible sources of PAHs.

**Keywords :** comparative correlation, kinetically and thermodynamically-favored PAHs, pearson correlation coefficient, cluster analysis, sources evaluation

**Conference Title :** ICEPP 2015 : International Conference on Environment Pollution and Prevention

**Conference Location :** Los Angeles, United States

**Conference Dates :** September 28-29, 2015