

## Distributions, Composition Patterns, Sources and Potential Toxicity of Polycyclic Aromatic Hydrocarbons (PAHs) Pollution in Surface Sediments from the Kim Kim River and Segget River, Peninsula Malaysia

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### ABSTRACT

This study investigated distributions, composition patterns, sources and potential toxicity of polycyclic aromatic hydrocarbon (PAHs) pollution in surface sediments from the Kim Kim River and Segget River, Peninsular Malaysia. The samples were extracted using Soxhlet extraction, purified using two-step silica gel column chromatography and then analysed by gas chromatography mass spectrometry (GC-MS). The total PAH concentrations ranged from 95.17 to 361.24 ng g<sup>-1</sup> dry weight (dw) and 330.09 to 552.76 ng g<sup>-1</sup> dw in surface sediments from the Kim Kim and Segget Rivers, respectively. Source type identification using PAH molecular indices and hierarchical cluster analysis (HCA) indicated that PAHs were mostly of pyrogenic origin, while in some stations petrogenic sources had a significant portion. A PAH toxicity assessment using sediment quality guidelines (SQGs), mean effect range-median quotient (M-ERM-Q), benzo[*a*]pyrene (BaP) equivalent concentration and BaP toxicity equivalent quotient (TEQ<sup>carc</sup>) indicated low probability of toxicity for both the Kim Kim and Segget Rivers. Moreover, the human health risk assessment applying Cancer Risk<sub>ingestion</sub> and Cancer Risk<sub>dermal</sub> indicated that probabilistic health risk to humans via ingestion and dermal pathways from sediments of the Kim Kim and Segget Rivers can be categorised as low-to-moderate risk.

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