

Identification of sources of tar balls deposited along the Goa coast, India, using fingerprinting techniques.

Abstract

Deposition of tar balls along the coast of Goa, India is a common phenomenon during the southwest monsoon. Representative tar ball samples collected from various beaches of Goa and one Bombay High (BH) crude oil sample were subjected to fingerprint analysis based on diagnostic ratios of n-alkane, biomarkers of pentacyclic tri-terpanes and compound specific stable carbon isotope ($\delta^{13}\text{C}$) analysis to confirm the source. The results were compared with the published data of Middle East Crude Oil (MECO) and South East Asian Crude Oil (SEACO). The results revealed that the tar balls were from tanker-wash derived spills. The study also confirmed that the source is not the BH, but SEACO. The present study suggests that the biomarkers of alkanes and hopanes coupled with stable carbon isotope analysis act as a powerful tool for tracing the source of tar balls, particularly when the source specific biomarkers fail to distinguish the source.

Keyword: Tar balls; Fingerprint; Biomarkers; Alkanes; Hopanes; $\delta^{13}\text{C}$.