

## ABSTRACT

*A Multi-parameter oil fingerprinting technique was developed for use in the identification of spilled oils and stranded tars. The analytical methodology was developed through the optimisation of reported methodologies in synchronous scan fluorescence spectroscopy and direct injection graphite furnace atomic absorption spectroscopy. The optimised instrumental techniques were used to chemically characterize (fingerprint) oils of known origin and the data logged in a reference data bank. A methodology for classifying and identifying oils was developed using the statistical matching techniques of hierarchical cluster analysis and discriminant function analysis.*

*The effectiveness of the developed fingerprinting technique was demonstrated in the identification of two oil spills which occurred in the marine environment during the course of the study.*

*Three surveys were conducted for the monitoring of tar loadings on beaches in Trinidad and Tobago which concluded that tar loadings, although relatively high, were lower than levels reported in previous studies. The collected tar was also fingerprinted and the matching technique used to provide preliminary insights into the origin of stranded tar found on the beaches surveyed. The results concluded that a multiplicity of possible sources exists for the tars collected on the beaches surveyed.*

Key words: Deenesh Persad; Chemometric; Fingerprinting; Discriminant analysis; Hierarchical cluster; Oils; Tars; Fluorescence; Atomic Absorption.