Geophysical Research Abstracts
Vol. 18, EGU2016-18086, 2016
EGU General Assembly 2016

Concentrations of surfactants and sterols in the surface microlayer of the estuarine areas of Selangor River, Malaysia

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This study determined the concentration of surfactant and sterols as biomarkers in the surface microlayer (SML) in estuarine areas of the Selangor River, Malaysia. SML samples were collected during different seasons using a rotation drum method. The compositions of surfactants in SML were determined as methylene blue active substances (MBAS) and disulphine blue active substances (DBAS) as anionic and cationic surfactants respectively. The concentration of sterols was determined using a gas chromatography equipped with a flame ionisation detector (GC–FID). The results show that the concentrations of surfactants around the estuarine area were dominated by anionic surfactants (MBAS) with average concentrations of 0.39 μmol L^{-1}. The concentrations of total sterols in the SML ranged from 107.06 to 505.55 ng L^{-1}. The surfactants and total sterol concentrations were found to be higher in the wet season. Cholesterol was found to be the most abundant sterols component in the SML of the Selangor River. The diagnostic ratios of sterols show the influence of natural sources and waste on the contribution of sterols in the SML. Further analysis, using principal component analysis (PCA), showed distinct inputs of sterols derived from human activity (40.58%), terrigenous and plant inputs (22.59%) as well as phytoplankton and marine inputs (17.35%).