Environmental impact of biomarkers

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Biomarkers are natural product that are derived from the decay of terrestrial or marine or mixed vegetation, thus inherits the biological characteristics of the source from which it was derived. The presence of some of the hydrocarbon may become toxic to soil microbes and phytotoxic to plants. The aim of the study was to extract biomarkers from oil seep samples and understand their impact on the soil environment. For that purpose, oil seep and soil impregnated with oil was collected from the Kundal oil field. GC-FID chromatogram results indicate that Kundal oil seep was biodegraded. This is more likely because of absence of n- alkanes and isoprenoids in oil seeps, soil impregnated with oil and wastewater samples within the vicinity of oil field at Kundal. The presence of aromatic biomarkers indicates that the source of organic matter in oil seep is from marine algae or phytoplankton. Furthermore, organic matter is mature and of marine in nature as the ratio is slightly greater than terrestrial organic matter. The depositional environment is hypersaline and source rock is shale. Paleoclimate reconstruction from aromatic biomarkers indicate that the presence of triterpanes is of marine algae origin. This suggests that the climate was anoxic and anaerobic microbial degradation may have occurred under saline condition. Saline conditions are confirmed by the presence of gammacerane in the oil seep sample. Steranes like gammacerane has confirmed the input of eukaryotic marine phytoplankton in organic matter. This suggests that the paleoclimate was anoxic, anaerobic microbes were abundant and saline conditions prevails the formation of the organic matter of the Kundal oil seep.