Proceedings of the 8th International Conference on Environmental Science and Technology
Lemnos Island, Greece, 8 – 10 September 2003
Full paper Vol. A, pp. 791 - 799

THE "EUROBULKER" OIL SPILL IN SOUTH EVOIKOS GULF: DISTRIBUTION AND FATE OF ALIPHATIC AND POLYCYCLIC AROMATIC HYDROCARBONS

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EXTENDED ABSTRACT

On September 1st, 2000, the ship "Eurobulker" sank in South Evoikos gulf and 700 tons of crude oil spilled into the water. Clean up operations of the coastal area, mainly via mechanical techniques, started immediately and were carried out for a period of about 5 weeks. The purpose of this study is to assess the short-term and mid-term effects of the oil spill and the subsequent clean-up measures on the coastal ecosystem. In this framework, hydrocarbon concentrations were measured in the water, sediment and clams (*Venus verrucosa).*

The concentrations of dissolved-dispersed petroleum hydrocarbons (DDPH) measured in seawater ranged between 0.10 and 0.64 μg/l in chrysene equivalents and were within the usual ranges for Greek waters and similar with those measured in the area before the accident. The only relatively high value (1.41 μg/l), which could be related with the oil spill, was recorded a month after the wreck at the deep site off Asopos River.

Aliphatic hydrocarbons (AHC) concentrations in sediments ranged from 11.3 to 38.0 μg/g in most stations. A high value (90.4 μg/g), which unambiguously indicates the presence of petroleum residues, was found at the deep site off Asopos River in October, where the highest DDPH value was also recorded. However, the highest AHC values were recorded at the shallow station close to the mouth of Asopos River in December (94.2 μg/g) and in May (87.2 μg/g). These values cannot be attributed to the accident but can be related to the river discharges. In respect to clams, the concentrations of AHC in October presented a very high value (516 μg/g) at the station close to Chalkoutsi, indicating an important bioconcentration one month after the accident. In December and May, hydrocarbon concentrations in clams were generally low, although slightly higher values were recorded in May but these are probably related with the different feeding rates of the organisms (*Venus verrucosa*) in different seasons. The relatively high value at the station close to the mouth of Asopos River (119 μg/g) is attributed to the river influence.

Polycyclic aromatic hydrocarbons (PAH) measured in sediments and clams over the 8 month study period after the oil spill, are generally considered as low and indicate that no significant pollution from these compounds existed in the area. Compounds with 4-6 aromatic rings were found in high abundances only in the sediment from deep stations. On the contrary, in sediment from shallow stations and in clams, the petroleum-originated compounds (2-3 aromatic rings) were more abundant than the pyrolytic ones. This differentiation could be related to the higher solubility and lower stability of the low MW PAHs, but it could also indicate fresh petroleum inputs in the area.

Key words: "EUROBULKER" oil spill, aliphatic hydrocarbons, polycyclic aromatic hydrocarbons, South Evoikos Gulf, Aegean Sea.