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1 Chemical characterization of biodegradation of oil contamination

S. Feinstein (1), S. Ezra (1), I. Pelly (1), A. Raviv (1), J. Ganor (1), D. Markel (2), I. Bar-Ilan (3) and Z. Ronen, (4)

 (1) Department of Geological and Environmental Sciences, Ben Gurion University of the Negev, Beer Sheva, Israel, (2) Lake Kinneret and Catchment Monitoring Dept., Water Commission, Rosh Pina, Israel, (3) Migal - Galilee Technology Center, Kiryat-Shmona, Israel,
(4) Department of Hydrology and Microbiology of the Environment, The Jacob Blaustein Institutes of Desert Research, Ben Gurion University of the Negev, Sede Boqer Campus, Israel. (shimon@bgu.ac.il / Fax: +972-8-6472997 / Phone: +972-8-6472622).

Observed and experimental variations in hydrocarbon composition and the differential resistance of molecules to different degradation processes were used in order to monitor the mechanism(s) involved in weathering and distribution of oil contamination. The weathering of diesel contamination in the unsaturated zone underlying the PZN military base in northern Israel and fuel oil spill at the Yarkon river bank are both characterized by a selective removal of *n*-alkanes with a decreasing effect as molecular weight increases and considerably milder effect on other molecular structures, implying dominance of biodegradation. Preliminary microbial analysis suggests that bacteria from the *Pseudomanos* group are among the active microorganisms in charge of the observed degradation of the contaminating diesel. In contrast, weathering of a fuel oil spill along the Mediterranean coastline north of the city of Ashdod had been controlled primarily by molecular weight with almost no regard of molecular texture, indicating mainly a physical mechanism rather than biodegradation.