

## **Effects of used lubricant oil contaminated soil on soil microbial activity and population size**

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Soil contamination with used lubricating oil (ULO) has become one of the major environmental issues in most of the cities throughout the world. As ULO contains polycyclic aromatic hydrocarbons and heavy metals, ULO contamination of soil may negatively affect the overall soil quality. Microbial properties of soil are vitally important for maintaining the status of the soil. Soil microbes are highly sensitive for any kind of alterations in the ecosystem. Therefore, soil microbial activity in addition to cell culture base technique is important to use as an integrated approach to determine the soil microbial status of ULO contaminated soil. The aim of the study was to investigate the effects of long term contamination of soil by ULO on soil microbial activity and population size. Five Soil samples with different level of contamination were collected from the service station in Mataradistrict, Sri Lanka. Three replicates from each sample were initially analyzed for total petroleum hydrocarbon (TPH) content and pH. Microbial population size of both cultivable heterotrophic bacteria and fungi were obtained as colony forming unit (CFU) by applying dilution plate count technique. Total microbial activity was determined by using Fluoresciendiacetate (FDA) hydrolysis method. TPH content varied from 35,667 mg kg<sup>-1</sup> to 62,667 mg kg<sup>-1</sup> for the analyzed samples. Each of the measured parameters in contaminated soil exhibited significant difference ( $p < 0.001$ ) compared to that in the uncontaminated control. The measured pH showed an increasing trend while cultivable heterotrophic bacterial population size, cultivable heterotrophic fungi population size and total microbial activity showed decreasing trend with the increase of TPH concentration. Overall results indicated the negative impacts of long term ULO contamination on soil microbial activity and population size.

*Keywords: Used lubricating oil, total petroleum hydrocarbon content, soil microbial population size, soil microbial activity*

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