

APPLICABILITY OF *Allium cepa* TEST TO ASSESS THE DEGREE OF PHYTOREMEDIATION OF SOIL CONTAMINATED WITH USED LUBRICATING OIL BY USING *Crotalaria retusa* L.

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Indiscriminate disposal of used lubricating oil (ULO) into the soil has become one of the major environmental issues in most of the cities throughout the world. Phytoremediation is a novel technique with a potential to be utilized to remediate ULO contaminated soil. The aim of the study was to investigate the applicability of *Allium cepa* test to assess the degree of phytoremediation of soil contaminated with ULO by using *Crotalaria retusa* L. A pot experiment was conducted by using ULO contaminated soils with the contamination levels of 10,000 mg/kg (T1), 20,000 mg/kg (T2) and 30,000 mg/kg (T3) w/w ULO according to the randomized block design (RBD) with four replicates per each contamination level. At the end of 90 days, *A. cepa* system showed significantly high Mitotic index (MI) for the treatments with plants (34.51, 23.34 and 20.30) compared to that of unplanted control (27.77, 20.81 and 16.42) for T1, T2 and

T3 respectively. The percentage biodegradation (43.75, 32.23 and 22.1) in the *C. retusa* rhizosphere soil was significantly high compared to that of unplanted control (25.15%, 16.4% and 9.15%) for T1, T2 and T3 respectively. The results infer that the phytoremediation and genotoxicity (MI and chromosomal aberrations) reduction in the treatment with *C. retusa* varied in time-dependent and contamination-level-dependent manner. The correlation analysis revealed highly positive correlations ($r=0.882$, 0.970 and 0.961) between percentage ULO biodegradation and MI for 30, 60 and 90 days respectively. Therefore, overall results conclude the potential application of *A. cepa* test to evaluate phytoremediation of soil contaminated with ULO by using *C. retusa* L.

Keywords: *Allium cepa* test, Mitotic index, Percentage biodegradation, Used lubricating oil contaminated soil