

Applicability of *Allium cepa* test system in toxicity characterization of used lubricant oil contaminated soil

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Contamination of soil with used lubricant oil is an emerging environmental problem in most of the cities across the world. Accidental spills, illegal dumping and careless handling of used lubricant oil have been significant sources of environmental pollution. *Allium cepa* test system is a simple sensitive and rapid bioassay widely used as a standard method for the biomonitoring of environmental contaminants. The present study was carried out to assess the applicability of *Allium cepa* test system in the toxicity characterization of used lubricant oil contaminated soils. Inhibitions in root growth and number of roots of *Allium* bulbs exposed to a range of used lubricant oil contaminated soils were recorded as phytotoxicity end points. Further, the calculated mitotic indexes and the observed different types of chromosomal aberrations in the root meristematic cells were considered as genetic end points. Chromosomal aberrations were detected by staining the root meristematic cells with toluidene blue. The tested soils exerted toxicity for all the evaluated end points with the dose dependent manner. Chromosomal aberrations were observed in all the phases of mitosis of root meristematic cells of *Allium cepa*. Chromosomal bridges were most prominent in the anaphase and the telophase of the cell cycle and abnormal chromosomal arrangements and nuclear buds were also observed. Thus the results highlighted the applicability of *Allium cepa* test system not only for phytotoxicity characterization but also for the characterization of potential cytotoxicity and genotoxicity of the used lubricant contaminated soil.

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