

CYTO-GENOTOXICITY ASSESSMENT OF WASTEWATER FROM AUTOMOBILE SERVICE STATION BY USING THE *Allium cepa* TEST

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Automobile service stations produce wastewater (WW) on a large scale with a combination of toxicants such as different types of hydrocarbons, detergents, etc. Therefore, the characterization of the potential cytotoxicity of WW before being discharged from automobile service stations is important. The study aimed to assess the cyto-genotoxic potential of wastewater generated in automobile service stations by using the *Allium cepa* test, which is widely used in the cyto-genotoxicity characterization of toxicants. Healthy, surface sterilized *A. cepa* bulbs grown in distilled water for 48 h under the dark were transferred to a series of treatments with 6.2, 12.5, 25.0, 50.0 and 100% WW and incubated for 48 h. Distilled water was used as the control. After the 48 h incubation period, the number and elongation of roots, mitotic index (MI) and frequencies of different types of aberrations were evaluated as endpoints. The complete randomized block design (CRB) was employed with three replicates per treatment and control. The data recorded from the endpoints were analyzed by one-way ANOVA followed by Tukey's posthoc test. The root number showed the contamination level-dependent significant reduction in treatments compared to the control (23.00 ± 0.57), and the lowest (6.67 ± 0.57) was recorded from the treatment with 25.0% WW. There were no visible roots in the 50.0% and 100%. The calculated mitotic index (MI) showed the contamination level-dependent downward trend, and the lowest value (36.9%) was recorded from the 100% WW compared to the control (82.5%). The higher frequencies of nuclear aberrations (NA), such as nuclear lesions, nuclear buds, binuclear cells and micro nucleus and chromosomal aberrations (CA), such as chromosomal bridges, chromosomal fragments, were recorded from the undiluted WW (100%), and the contamination level-dependent decrease in the cells with aberrations was observed in lower contamination levels. The highest frequency of aberrant cells (61.2%) was recorded from undiluted WW (100%). The calculated IC_{50} values (6.25%) were based on the inhibitions in root number, and the calculated MI inferred the potential cytotoxicity. Different types of NAs and CAs observed in the study inferred the potential genotoxicity even at the low level of contamination of WW, highlighting the significance of treating WW before being released into the environment.

Keywords: *Allium cepa*, Cyto-genotoxic potential, Mitotic index, Wastewater