

Assessment of Cytotoxicity and Genotoxicity of Industrial Waste Waters Reaching Dandugan Oya, Sri Lanka using *Allium cepa* (Common Onion) Bioassay

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Dandugan Oya, located in Gampaha District is currently facing a problem related to water quality deterioration due to pollutant inputs from multiple sources. The present study was carried out to assess the potential cytotoxic/genotoxic effects of two industrial waste waters (textile dyeing effluent and tannery effluent) reaching the Dandugan Oya and water from downstream area of the Dandugan Oya using the standard *Allium cepa* bioassay. The upper stream of the Attanagalu Oya was used as the reference site. Potential cytotoxic/genotoxic effects (if any) of the tap water were also tested for comparison purposes. Most of the measured physico-chemical parameters of the water/effluent samples of the Dandugan Oya sites were within the national tolerance limits specified for effluent discharge into inland waters. However, *A. cepa* bioassay revealed inhibition (2-6 folds) of root growth and mitotic indices of root tip cells of *A. cepa* bulbs exposed to the water/effluent samples collected from the Dandugan Oya sites compared to that of *A. cepa* bulbs exposed to the tap water and the water of the reference sites. Furthermore, root tip cells of *A. cepa* bulbs exposed to the water/effluent samples from the Dandugan Oya sites exhibited induction of micronuclei, increased occurrence of chromosomal aberrations (2-21 folds) and nuclear abnormalities (3-14 folds) in comparison to that of the *A. cepa* bulbs exposed to the tap water and the water of the reference site. No significant differences between the aged tap water and water of the reference site were found in relation to the measured parameters ($P > 0.05$). The present study revealed that the textile dyeing effluent and the tannery effluent reaching the Dandugan Oya contained cytotoxic/genotoxic contaminations which had not been reduced by the inherent dilution and detoxifying capacity of the water body, hence resulting cytotoxic/genotoxic effects of the downstream water.