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Evaluation of mutagenic activity of an Iraqi wastewater treatment plant effluent with the *Salmonella* fluctuation test

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ABSTRACT:

The purpose of wastewater treatment is to eliminate or reduce water contaminants that impose environmental threats if they are discharged into the environment without the appropriate treatment. The aim of this study was to assess the mutagenicity effects of Al-Dewanyia wastewater treatment plant effluents by the *Salmonella* fluctuation test using the test strains TA98 and TA100 without metabolic activation. Four sizes, 1, 5, 10, and 15 mL, of the effluent sample were used with each bacterial test strain. The results showed that the effluent induced an increase in the number of revertants colonies in the both test strains in a significant dose-dependent manner; $P<0.05$. In the bacterial test strain TA98 the increase in the number of revertants colonies was significant, the mutation rate was more than two regardless of the sample size. In contrast to the bacterial test strain TA98, the induced mutagenic activity in the test strain TA100 was insignificant and the mutation ratio was less than two for all the sample' sizes. The effluents contain high levels of direct-acting frameshift-type mutagens but relatively low levels of direct-acting base pair-type mutagens. The differences in the mutagenicity levels may be due to the various induced genotoxicity types. The study demonstrates that the effluents pose ecological hazards, and thus they should be properly treated to reduce and/or eliminate the potentially genotoxic compounds before being discharged into the receiving environments.

Keywords:
Mutagenicity, *Salmonella* fluctuation test, TA98, TA100, frameshift, base-pair.

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