## Advanced Oxidation Processes as a Pre-oxidation Step for Biological Treatment of Leachate from Technical Landfills

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**Abstract :** Algerian cities are confronted with large quantities of waste generated by the disposal of household and similar residues in technical landfills (CET), such as the one in the location of Batna. The interaction between waste components and incoming water generates leachates rich in organic matter and trace elements, which require treatment before discharge. The aim of this study was to propose an effective process for treating the leachates, which were subjected to an initial chemical treatment using the  $(H_2O_2/UV)$  system. Optimal treatment conditions were determined at  $[H_2O_2]$  of 0.3 M and pH of 8.6. Next, two hybrid biological treatment systems were applied: hybrid system I  $(H_2O_2/UV)$ /bacteria) and hybrid system II  $(H_2O_2/UV)$ /bacteria/microalgae). The three processes resulted in the following degradation rates, expressed in terms of total organic carbon (TOC) 27.4% for the  $(H_2O_2/UV)$  system; 58.1% for the hybrid system I  $(H_2O_2/UV)$ /Bacteria); 67.86% for the hybrid system II  $(H_2O_2/UV)$ /Bacteria/Microalgae). This study demonstrates that a hybrid approach combining advanced oxidation processes and biological treatments is a highly effective alternative to achieve satisfactory treatment.

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