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## Power generation and pollutants removal from landfill leachate in microbial fuel cell: Variation and influence of anodic microbiomes

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### Abstract

MFC was studied using young and old landfill leachate substrate to remove pollutants and produce renewable energy coupled with study of anodic microbiomes. The power output of  $96.8 \text{ mWm}^{-2}$  with COD removal of  $90.0 \pm 1.2\%$  was achieved at young leachate 60% in batch mode, which decreased to  $75 \text{ mWm}^{-2}$  having 55.5% COD abatement in continuous mode employing 100% young leachate. Power production using simulated wastewater without organic source proved that ammonium could also serve as fuel in MFC. The high ammonium dosage increased the overall system performance but beyond a certain limit, the inhibitory effect intensified. Nitrogen removal ( $66.0 \pm 3.3\%$   $\text{NH}_4^+$ -N and  $86.0 \pm 0.1\%$   $\text{NO}_2^-$ -N) occurred obeying different removal pathways. Sequencing analyses revealed that anammox bacteria (2%), denitrifying bacteria (5%) and electrogenic bacteria (15%) were in abundance of the microbial community in the

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