

Abstract

Poultry droppings from poultry farms and rice husks obtained from rice milling process are generally considered as wastes and discarded in Nigeria. Although many studies have shown that microbial fuel cells (MFCs) can generate electricity from organic wastes, little or no study have examined MFCs for generating electricity from poultry droppings and rice husk as electrode material. Laboratory-scale double-chamber MFCs were inoculated with concentrations of poultry droppings wastewater and supplied with rice husk charcoal as anode and cathode electrodes for electricity generation. Power outputs and dissolved organic carbon (DOC) removal efficiencies were compared between MFCs using rice husk charcoal (RHCE) as electrode and those using carbon cloth (CCE) as electrodes. The RHCE-MFC 2 containing 477 mg L⁻¹ dissolved organic carbon produced a volumetric power density of 6.9 ± 3.1 W m⁻³ which was higher than the control and the CCE-MFCs by a factor of 2 and achieved at DOC removal efficiencies of $40 \pm 1.2\%$. The results suggest that poultry droppings wastewater is a feasible feedstock for generating electricity in MFCs. The findings also suggest that rice husk charcoal is a potentially useful electrode material in MFCs.

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