



Microbial Fuel Cell: A Promising Technology for Harnessing Bioenergy from Yamuna Water

Darshan Malik^{*}, Sunita Singh, Jayita Thakur, Anita Kapoor, Shashi Nijhawan

Department of Biochemistry, Shivaji College, University of Delhi, New Delhi, India

Address for Correspondence: Darshan Malik: darshanmalik@yahoo.com

ABSTRACT: Microbial Fuel Cells (MFCs), is a futuristic technology and has proved to be an alternative source of renewable energy. MFCs harness the metabolism of microbes and convert their chemical energy into electrical energy. The present study involves a comparison between MFCs with and without mediators using water samples collected from the Yamuna river at Nizamudin bridge. The analysis of physico-chemical parameters indicated low levels of dissolved oxygen and alarmingly high levels of coliforms. The performance of MFC was checked in the presence and absence of mediators. The columbic efficiency of the MFC was compared by varying the proton bridges (conventional salt bridge versus the proton exchange membrane). Glucose is used as substrate, which is considered as an instantaneous source of energy for the biological systems. The electricity generated by MFC with mediator was found to be higher as compared to that of mediator-less MFC. The Yamuna water is deemed to contain a consortium of bacteria, which may be responsible for the generation of electricity. Secondly, chemical compounds (Fe^{+++} , NO_2^- , SO_4^{--}) present in the Yamuna water may act as mediators of the electrons transport to the anode and hence increase the potential difference. The usage of Nafion membrane also leads to significant increase in the power generated by the MFC as compared to the conventional salt bridges. Attempts to increase the efficiency of our system are being carried out by fabricating electrodes using nanotechnology. © 2014 iGlobal Research and Publishing Foundation. All rights reserved.

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