ABSTRACT

The deep-sea ecosystem is a largely unexplored environment with unique chemical and physical conditions that impact the organisms living there. Deep-sea sediments contain a diverse population of electroactive bacteria (EABs) that have the potential to generate electricity in microbial fuel cells (MFCs). This study aims to investigate the influence of salinity concentration on bacterial viability and power generation in deep-sea sediment microbial fuel cells (SMFCs). Three deep-sea SMFCs with different salinity concentrations (33 g/L, 35 g/L, and 38 g/L) were constructed and evaluated for their current density, power density, and electrochemical impedance spectroscopy (EIS). Viable cell enumeration techniques were employed to quantify the remaining live cells, and cell morphology was observed through microscopy. The power density decreased with increasing salinity, and the internal resistance of the deep-sea SMFCs increased with higher salinity. Highest current density and power density was found at salinity concentration of 33 g/L at 240.6547 mA/m^2 and 16.3159 mA/m^2.

Keywords: deep-sea sediment microbial fuel cell, salinity, power generation