

عنوان مقاله:

The Potential of Using Microbial Fuel Cells as a "Quality" Monitor for Ornamental Seawater Aquarium

محل انتشار:

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خلاصه مقاله:

Introduction: Microbial Fuel Cells (MFCs) can be applied as biological sensors for the monitoring of Biochemical Oxygen Demand (BOD), toxic substances, and nutrients in the water. Research on the application of MFC biosensors in ornamental aquariums is relatively limited. **Materials and Methods:** In order to carry out this study, we applied a single-chamber and mediator-free sediment MFC in an ornamental seawater aquarium as an economical and straightforward biosensor to monitor water quality. Accordingly, the water quality parameters, including temperature, pH, Dissolved Oxygen (DO), Oxidation-Reduction Potential (ORP), and Electrical Conductivity (EC) were analyzed. **Results:** After the induction of an artificial die-off environment, the Dissolved Oxygen and Oxidation-Reduction Potential showed decreasing trends, and the Electrical Conductivity showed an increasing trend. The voltage output decreased during the initial die-off stage. Principal Component Analysis (PCA) clusters the individuals of the initial die-off stage at the boundary of the regular individuals. Spearman correlation suggests that electricity generation during the initial die-off stage is positively correlated with ORP. **Conclusions:** According to the findings of the present study, it can be stated that the die-off stress causes electrochemical inhibition, resulting in a decrease in electricity generation.

کلمات کلیدی:

Sediment Microbial Fuel Cells, Biosensor, Voltage, Artificial Die-off

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