Characteristics and Microbial Activity of *Shewanella* and *Escherichia coli* under a Direct-Current Electric Field

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The effects of a direct-current electric field on cell viability and physicochemical properties of exoelectrogens and non-exoelectrogens, e.g., *Shewanella* and *Escherichia coli*, were studied. The results obtained through the analysis of differences in growth patterns and growth rates for *Shewanella* and *Escherichia coli* under electric fields with varying intensity showed that the direct-current electric field accelerated the growth of microbes. More *Escherichia coli* grew in the cathode, and more *shewanella* grew in the anode. When *Shewanella* and *Escherichia coli* were used as the culture, the activation resistance accounted for a large proportion of the total resistance, and the activation resistance with *Shewanella* was much less than that with *Escherichia coli*. The anode capacitance with *Shewanella* was higher than that with *Escherichia coli*, indicating that the anode capacitance is negatively correlated with the resistance.

Keywords: Electrochemistry analysis; *Shewanella*; *Escherichia coli*; Direct-current electric field; Bioelectrochemical system

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