Photocurrent Production with Thermophilic Cyanobacterial Strain under Electrochemical Treatment without Adding of Mediators

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A thermophilic cyanobacterial strain, *Thermosynechococcus* sp. CL-1 (TCL-1) was examined to investigate photocurrent generation under illumination without the adding of artificial mediators in an H-type two-compartment electrolysis cell. Dissolved inorganic carbon (DIC) was used as a nitrogen source at 0.2 V (vs Ag/AgCl). Additionally, cyclic voltammetric experiments were used to verify the presence of oxidative compound excreted from TCL-1. Results indicated that the relationship between photocurrent generation and TCL-1 cell mass is a positive linear. No apparent differences on TCL-1 growth between the case of control and 0.2 V (vs Ag/AgCl) indicated the electron uptake from TCL-1 at 0.2 V has no effect on its growth. The presence of redox compound excreted from TCL-1 is supported through the cyclic voltammetric experiment and plastoquinone, cytochrome b6/f, and plastocyanin between 0.2 and 0.7 V are the most probable mediators in electron transportation.

Keywords: Thermophilic cyanobacterial strain, Photocurrent, Cyclic Voltammetric, Photosynthesis, Electron Transporation.

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