Performance of different Sporomusa species for the microbial electrosynthesis of acetate from carbon dioxide

Sporomusa ovata DSM-2662 produces high rate of acetate during microbial electrosynthesis (MES) by reducing CO2 with electrons coming from a cathode. Here, we investigated other Sporomusa for MES with cathode potential set at -690mVvsSHE to establish if this capacity is conserved among this genus and to identify more performant strains. S. ovata DSM-2663 produced acetate 1.8-fold faster than S. ovata DSM-2662. On the contrary, S. ovata DSM-3300 was 2.7-fold slower whereas Sporomusa aerivorans had no MES activity. These results indicate that MES performance varies among Sporomusa. During MES, electron transfer from cathode to microbes often occurs via H2. To establish if efficient coupling between H2 oxidation and CO2 reduction may explain why specific acetogens are more productive MES catalysts, the metabolisms of the investigated Sporomusa were characterized under H2:CO2. Results suggest that other phenotypic traits besides the capacity to oxidize H2 efficiently are involved.

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