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.

General information
State: Published
Organisations: Novo Nordisk Foundation Center for Biosustainability, Research Groups, Bioelectrochemical Systems, Microbial Electro synthesis, New Bioactive Compounds, Wuhan University of Technology
Contributors: Aryal, N., Tremblay, P., Lizak, D. M., Zhang, T.
Pages: 184-190
Publication date: 2017
Peer-reviewed: Yes

Publication information
Journal: Bioresource Technology
Volume: 233
ISSN (Print): 0960-8524
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Scopus rating (2017): CiteScore 6.28 SJR 2.029 SNIP 1.799
Web of Science (2017): Impact factor 5.807
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 5.94 SJR 2.215 SNIP 1.932
Web of Science (2016): Impact factor 5.651
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): CiteScore 5.47 SJR 2.243 SNIP 1.897
Web of Science (2015): Impact factor 4.917
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): CiteScore 5.3 SJR 2.399 SNIP 2.087
Web of Science (2014): Impact factor 4.494
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 2
Scopus rating (2013): CiteScore 5.97 SJR 2.405 SNIP 2.477
Web of Science (2013): Impact factor 5.039
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 2
Scopus rating (2012): CiteScore 5.25 SJR 2.334 SNIP 2.461
Web of Science (2012): Impact factor 4.75
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 2
Scopus rating (2011): CiteScore 5.56 SJR 2.308 SNIP 2.507
Web of Science (2011): Impact factor 4.98