Title:	Microbial electroactive biofilms dominated by Geoalkalibacter spp. from a highly saline–alkaline environment
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Abstract:	Understanding of the extreme microorganisms that possess extracellular electron transfer (EET) capabilities is pivotal to advance electromicrobiology discipline and to develop niche-specific microbial electrochemistry-driven biotechnologies. Here, we report on the microbial electroactive biofilms (EABs) possessing the outward EET capabilities from a haloalkaline environment of the Lonar lake. We used the electrochemical cultivation approach to enrich haloalkaliphilic EABs under 9.5 pH and 20 g/L salinity conditions. The electrodes controlled at 0.2 V vs. Ag/AgCl yielded the best-performing biofilms in terms of maximum bioelectrocatalytic current densities of 548 ± 23 and 437 ± 17 μA/cm2 with acetate and lactate substrates, respectively. Electrochemical characterization of biofilms revealed the presence of two putative redox-active moieties with the mean formal potentials of 0.183 and 0.333 V vs. Ag/AgCl, which represent the highest values reported to date for the EABs. 16S-rRNA amplicon sequencing of EABs revealed the dominance of unknown Geoalkalibacter sp. at ~80% abundance. Further investigations on the haloalkaliphilic EABs possessing EET components with high formal potentials might offer interesting research prospects in electromicrobiology.
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