Title:	Electrochemical enrichment of haloalkaliphilic nitrate-reducing microbial biofilm at the cathode of bioelectrochemical systems
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Abstract:	Electrotrophic microorganisms have not been well studied in extreme environments. Here, we report on the nitrate-reducing cathodic microbial biofilm from a haloalkaline environment. The biofilm enriched via electrochemical approach under 9.5 pH and 20 g NaCl/L salinity conditions achieved current density and nitrate reduction efficiency via partial and complete denitrification. Voltammetric characterization of the biocathodes revealed a redox center with (vs. Ag/AgCl) formal potential putatively involved in the electron uptake process. The lack of soluble redox mediators and hydrogen-driven nitrate reduction suggests direct-contact cathodic electron uptake by the nitrate-reducing microorganisms in the enriched biofilm. 16S-rRNA amplicon sequencing of the cathodic biofilm revealed the presence of unreported Pseudomonas, Natronococcus, and Pseudoalteromonas spp. at , and relative sequence abundances, respectively. The enriched nitrate-reducing microorganisms also reduced nitrate efficiently using soluble electron donors found in the lake sediments, thereby suggesting their role in N-cycling in such environments.
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