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Stable carbon isotope fractionation of chlorinated ethenes by a microbial consortium containing multiple dechlorinating genes

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Abstract:

The study aimed to determine the possible contribution of specific growth conditions and community structures to variable carbon enrichment factors ($\mathcal{E}$-$_{carbon}$) values for the degradation of chlorinated ethenes (CEs) by a bacterial consortium with multiple dechlorinating genes. $\mathcal{E}$-$_{carbon}$ values for trichloroethylene, *cis*-1,2-dichloroethylene, and vinyl chloride were −7.24% ± 0.59%, −14.6% ± 1.71%, and −21.1% ± 1.14%, respectively, during their degradation by a microbial consortium containing multiple dechlorinating genes including *tceA* and *vcrA*. The $\mathcal{E}$-$_{carbon}$ values of all CEs were not greatly affected by changes in growth conditions and community structures, which directly or indirectly affected reductive dechlorination of CEs by this consortium. Stability analysis provided evidence that the