

Biogeosciences Discuss., referee comment RC1
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Comment on bg-2021-203

Anonymous Referee #2

Referee comment on "Fractionation of stable carbon isotopes during acetate consumption by methanogenic and sulfidogenic microbial communities in rice paddy soils and lake sediments" by Ralf Conrad et al., Biogeosciences Discuss.,
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The submitted manuscript provides a substantial contribution to the field of carbon isotope fractionation of acetate in a number of anoxic environments and the competition for acetate between methanogenic and sulfidogenic microbial communities. The chosen approach is scientific sound and great detail has been used in experimental design and including appropriate control systems. The gained results, e.g. comparing obtained carbon isotope fractionation factors with microbial communities are in great agreement.

As pointed out by the authors, pure culture as well as environmental studies on carbon isotope fractionation during acetate consumption are quite limited, particularly for sulfate-reducing bacteria, and the submitted work provides additional insights in potential processes and pathways involved.

The manuscript is a great fit for the scope of Biogeosciences, covering for example the subject areas biodiversity and ecosystem function, environmental microbiology, biogeochemistry and global elemental cycles, and biogeochemistry and gas exchange.