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ELEVATED ACETATE CONCENTRATIONS IN THE RHIZOSPHERE OF *SPARTINA ALTERNIFLORA* AND POTENTIAL INFLUENCES ON SULFATE REDUCTION.

Acetate is important in anaerobic metabolism of non-vegetated sediments but its role in salt marsh soils has not been investigated thoroughly. Acetate concentrations, oxidation ($^{14}C$) and $SO_4^{2-}$ reduction ($^{35}S$) were measured in *S. alterniflora* soils in NH and MA. Pore water from cores contained >0.1 mM acetate and in some instances >1.0 mM. Non-destructive samples contained <0.01 mM. Acetate was associated with roots and concentrations were highest during vegetative growth and varied with changes in plant physiology. Acetate turnover was very low whether whole core or slurry incubations were used. Radiotracers injected directly into soils yielded rates of $SO_4^{2-}$ reduction and acetate oxidation not significantly different from core incubation techniques. Regardless of incubation method, acetate oxidation did not account for a significant percentage of $SO_4^{2-}$ reduction. These results differ markedly from data for non-vegetated coastal sediments where acetate levels are low, oxidation rate constants are high and acetate oxidation rates greatly exceed rates of $SO_4^{2-}$ reduction. The discrepancy between rates of acetate oxidation and $SO_4^{2-}$ reduction in marsh soils may be due either to the utilization of substrates other than acetate by $SO_4^{2-}$ reducers or artifacts associated with measurements of organic utilization by rhizosphere bacteria.