

NOTES AND CORRESPONDENCE

Ethology of the *Zoophycos*-Producer: Arguments against the Gardening Model from $\delta^{13}\text{C}_{\text{org}}$ Evidences of the Spreiten Material

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ABSTRACT

Recently proposed ethological explanations for the trace fossil *Zoophycos* include gardening of microorganisms. Because microorganisms are known to fractionate strongly against ^{13}C , especially under low oxic to anoxic conditions, it is argued that any gardening activity in the trace would result in a noticeable shift in $\delta^{13}\text{C}_{\text{org}}$ between spreiten and adjacent host sediment. In order to test this hypothesis, $\delta^{13}\text{C}_{\text{org}}$ of the Spreiten Material and directly adjacent host material was measured. Measured $\delta^{13}\text{C}_{\text{org}}$ in a glacial section of the core ranges from -22.6 to -22.9‰ for host sediment and between -22.8 and -23.2‰ for *Zoophycos* material. In an interglacial section the *Zoophycos* material measures -21.9‰, whereas the host material ranges from -21.2 to -21.4‰. The minimal difference between *Zoophycos* and host material suggests that gardening plays an insignificant role. The gardening hypothesis is therefore rejected in favor of a cache model, where food is squirreled away for poorer times.

(Key words: Chemosymbiosis, Isotope fractionation, Sulfur-oxidizing bacteria, Sulfate reducing bacteria, Methanogenesis)

1. INTRODUCTION

Zoophycos is a group of trace fossils that embraces a large variety of three-dimensional,

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