

Interactive comment on “Technical note: Methionine, a precursor of methane in living plants” by K. Lenhart et al.

K. Lenhart et al.

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The authors wish to thank the referee for his/her efforts in reviewing our manuscript and for the helpful and constructive comments provided. Below are our point by point responses to all issues raised by the referee. The manuscript has been revised accordingly.

General Comments Plant-derived methane emissions have been controversially debated in the past years. On the basis of previous studies, clearly, plants are a source of non-microbial methane in nature. In this study, the authors used stable isotope techniques to verify methane production and to identify the carbon precursor. The authors found that the amino acid L-methionine acts as a methane precursor in living lavender (*Lavandula angustifolia*). This study should be of strong interest to readers. I found

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that this manuscript was clearly presented and largely recommended its publication in Biogeosciences subject to a minor revision.

Specific comments (1) Page 16089, Line 4-5; Page 16102, Table 1: Different words were named for the different experiments, such as the initial experiment, the second experiment, consecutive treatment experiment, and parallel treatment experiment. Please elucidate them and use identical names throughout the whole manuscript. Authors' response: Corrections made.

(2) Page 16090, Line 2-3: This procedure took approximately one minute for all leaves or six leaves of each plant? Please elucidate. Authors' response: We have added information to make this point clearer (lines 131-132). (3) Page 16093, Line 18: In this manuscript, the different units were used for the CH₄ (pmol) and CO₂ (mol) to calculate the CH₄:CO₂ ratio. In general, the ratios were more than 1 but absolute emissions of CO₂ were much more than CH₄. If possible, please provide additional remind information in the manuscript. Authors' response: We have changed the CH₄:CO₂ ratio unit from pmol:μmol to mol:mol x10⁶ in den results section (line 228), in the discussion section, and in Fig. 2.

(4) Page 16094, Line 24-27: In Wang et al. (2011), CH₄ emission rates were for intact leaves, not for intact plants. Please correct them. Authors' response: Corrections made. (5) In the section “4.3 Methionine as a precursor of CH₄ in plants”: If possible, please add the discussion on the precursors of CH₄ in plants. The methyl group or its analogue is ubiquitous in organic compounds (Wang et al., 2013, Earth-Science Reviews 127, 193–202). Methionine could be only one of many precursors. Authors' response: We have added a paragraph dealing with potential precursor compounds of methane in plants (lines 320-324). (6) Figure 1: The latter half of the figure legend can be removed to the result section. Authors' response: As suggested by the referee we deleted the second half of the figure legend, as the information was already included in the results section.

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