

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

Anonymous Referee #3

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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 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.

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Please elucidate them and use identical names throughout the whole manuscript. (2) Page 16090, Line 2-3: This procedure took approximately one minute for all leaves or six leaves of each plant? Please elucidate. (3) Page 16093, Line 18: In this manuscript, the different units were used for the CH₄ (pmol) and CO₂ (μmol) 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. (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. (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. (6) Figure 1: The latter half of the figure legend can be removed to the result section.

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