

Interactive comment on “Carbon isotope anomaly in the major plant C₁ pool and its global biogeochemical implications” by F. Keppler et al.

F. Keppler et al.

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We would like to thank the referee for the very kind comments and finding it suitable for publication in Biogeosciences.

We agree with the comment ‘However, the considerations about CH₄ in the conclusion and in the abstract do not cover the experiments presented in the paper’ made by the Referee in the main points section but would like to stress that our considerations about CH₄ were purely speculative in both the abstract and conclusion. This we regard as an Authors privilege in any manuscript and as such thought we were careful with our choice of wording. However, in order to avoid confusion, we suggest strengthening the wording in the abstract to read ‘...represents an important source for methanogenesis and thus could be envisaged a possible significant source of isotopically...’

Response to the specific comments of Referee 3

Page 395 line 17 - agree change suggested

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Page 395. Stable isotope measurements - agree change suggested. We will insert the description of the column in the revised manuscript.

Page 395, line 25 - agree change suggested. We will insert '2 sigma' in the revised manuscript.

Page 395, line 27 - we will add a sentence for clarification

Page 396, line 7 - do not agree, biomass is necessary here

Page 396, line 14 - do not agree, signature is better word for here

Page 397, line 9 - agree change suggested - change ~ -45 to -45.4

Page 397, line 10 - agree change suggested - add (see Table 1) at end of sentence

Page 397, line 15 - agree change suggested

Page 398, line 5-6 - agree change suggested - we will make the appropriate changes

Page 400, line 23 to page 401, line 6 - We agree with the Referee that this part of the conclusion is interesting and thus we would like to retain it in the manuscript. We are aware that we provide no experiments to support our idea of a possible link between methane and C1 substrate, however we would like to keep this as a hypothesis that has to be verified in the future. As the abstract has now been clearly modified to show that when we consider methane we are speculating about its origin we will also make the appropriate changes in the part of the conclusions when we submit a revised version.

Page 401, line 12 - agree change suggested

Fig. 1 (b) and Fig 1 (d) - agree change suggested

Fig. 1 (c) - agree change suggested

Fig. 2 - do not fully agree change suggested because in this figure we wish, as stated in the original Figure legend, to relate carbon isotope signatures for VOCs to their sources. However, in deference to the Referee, we will modify the figure by adding a

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line within the methyl halide box to show reported tropospheric values and include the references as suggested.

Table 1, caption - agree change suggested - caption will now read 'd13C values... produced upon isothermal heating for 20 minutes at 225°C dried plant tissue'

Table 1, label: 'C3-leaf tissue' - agree change suggested, we will modify the table

Table 1 and Table 2: Yes the 'Biomass and pectin methoxyl d13C values of Cocksfoot (*Dactylis glomerata*), Glasswort (*Salicornia* sp), Maize (*Zea mays*), Saltwort (*Batis maritima*), Scarlet paintbrush (*Crassula falcata*) are values from the same experiment'. In answer to: 'Whereas the biomass and pectin methoxyl d13C values of European ash (*Fraxinus excelsior*), Wych elm (*Ulmus glabra*), Hazelnut (*Corylus avellana*), English oak (*Quercus robur*), Norway maple (*Acer platanoides*) are different in table 1 and in table 2. Why didn't you use the average of biomass d13C' - we were interested in demonstrating the consistency of fractionation between the biomass and pectin methoxyl pool and consider it more appropriate to show the data we obtained from samples collected at two different times, namely, October 2002 for Table 1 and July 2003 for Table 2.

We thank Referee 3 for the constructive criticism and believe that the changes suggested have improved the manuscript.

Interactive comment on Biogeosciences Discussions, 1, 393, 2004.

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