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Interactive comment on "Chlorophyll a specific Δ^{14}C, δ^{13}C and δ^{15}N values in stream periphyton: implications for aquatic food web studies" *by* N. F. Ishikawa et al.

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Dear the editors and referees,

We are grateful to the constructive comments from three anonymous referees on our paper. We also thank the associate editor Dr. Tom J. Battin for handling the manuscript. Below we responded to each of the referees' comments and described how we revised the manuscript. The numbers of page and line (e.g., P10L23) in our response are for the revised manuscript (please see also supplement file, the revised sentences are highlighted). We believe that the revised manuscript has been greatly improved in accordance with the referees' valuable suggestions. In case we disagree with a

specific recommendation, further explanations supporting our approach were made.

Sincerely,

Naoto F. Ishikawa

Responses to the comments from Referee #2

(RC: Referee comment; AC: Author comment)

(RC) The manuscript by Ishikawa et al. showed that chlorophyll a compound-specific Δ14C, δ13C and δ15N values in stream periphyton. The data and implications are novel and may be useful for future stream food-web studies. The manuscript was well written and the results are clear, but I have a few concerns on the manuscript.

(AC) Thank you for your valuable comments. Please see our responses to your comments below.

(RC) 1) P11065L21 It is unclear why you used the both chlorophyll a and phaeophytin a. If you used the both you should explain the reasons.

(AC) We moved the sentence explaining why both chlorophyll a and phaeophytin a were used from section 3.1 to section 2.2. Please see P6L5-9.

(RC) 2) The mechanisms to explain the differences in Δ14C between bulk and chlorophyll-a specific in litters were unclear. I am interested in the data because I guessed the Δ14C of bulk would take lower values than that of chl-a. So, I recommend you to discuss more about the phenomenon.

(AC) We revised this paragraph explaining the differences in Δ14C between bulk and chlorophyll a in Q. glauca. To support our explanation, two references (Trumbore and Zheng 1996; Koarashi et al., 2009) showing that soil organic carbon does not necessarily have modern carbon were added. Furthermore, we discussed that carbon in chlorophyll a molecule may be originated from various sources because its biosynthesis has multiple channels to acquire carbon. Please see P10L23-P11L8.

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(RC) 3) I understood some of implications of this study in the last paragraph. But in the most of the periphyton samples, the isotope values of the bulk and chl-a specific are very close. I think from this study, we should not consider the chl-a specific isotopes in the most cases. You should emphasize which situation the chl-a specific isotopes are useful to analyze stream food web, e.g., habitats and algal compositions.

(AC) We revised section 3.5 to stress on potential advantages of chlorophyll specific isotope analysis for not only stream ecology, but also aquatic biogeochemical science. A brief note on pitfalls in the methodology was also added. Please see section 3.5.

End of responses to the comments from Referee #2

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/12/C6281/2015/bgd-12-C6281-2015-supplement.pdf

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Interactive comment on Biogeosciences Discuss., 12, 11089, 2015.