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Interactive comment on "Evidence of old soil carbon in grass biosilica particles" *by* P. E. Reyerson et al.

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We thank the anonymous reviewer#3. We truly appreciate his/her time and expertise in critically reviewing our article and for those valuable suggestions. We will make all the possible changes requested by this reviewer.

It may seem confusing the use of phytC (term used in all the following publications - Santos et al. 2010, 2012a,b, 2016; Corbineau et al. 2013, Alexandre et al. 2015a,b) instead of phytOC, which was born based on the assumption that carbon embedded in phytoliths is from a CO2 photosynthetic origin. Moreover, the term phytOC implies that all the carbon embedded in phytolths must be organic-based, a fact not yet established. At the present study, just one amendment (in planter B) contained inorganic-

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carbon from a natural deposit (greensand) as well as competing amounts of organic carbon of similar 14C ages. PhytC stable isotope results suggested that the amendment inorganic-carbon contribution (if any) was undetectable. As yet, and based on one single amendment, we do not have other ways to infer if "inorganic carbon-containing compounds" cannot be encapsulated by phytoliths.

In response to reviewer comments#2 and 3, we will re-organize the manuscript to provide more clarity for the results and discussion sections. We believe that the recently developments in this field, especially in regard to extra phytC anomalous 14C data from independent authors (e.g. Piperno 2015 and Santos et al. 2016), plus the evidence of direct uptake of C by roots in Alexandre et al. (2015b) will help us to provide those necessary clarifications.

References cited here:

Alexandre et al. (2015a) New highlights of phytolith structure and occluded carbon location: 3-D X-ray microscopy and NanoSIMS results, Biogeosciences, 12, 863–873

Alexandre et al. (2015b) Direct uptake of organic carbon by grass roots and allocation in leaves and phytoliths: 13C labeling evidence, Biogeosciences Discuss., 12, 19751-19780

Corbineau et al. (2013) Towards producing pure phytolith concentrates from plants that are suitable for carbon isotopic analysis, Rev. Palaeobot. Palyno., 197, 179–185.

Piperno (2015) Phytolith radiocarbon dating in archaeological and paleoecological research: a case study of phytoliths from modern Neotropical plants and a review of the previous dating evidence. J. Archaeol. Sci. http://dx.doi.org/10.1016/j.jas.2015.06.002.

Reyerson et al. (2015). Evidence of old soil carbon in grass biosilica particles, Biogeosciences Discuss., 12, 19751-19780

Santos et al. (2010) The phytolith 14C puzzle: a tale of background determinations

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and accuracy tests. Radiocarbon 52, 113 -128.

Santos et al. (2012a) Possible source of ancient carbon in phytolith concentrates from harvested grasses. Biogeosciences 9, 873 e 1884.

Santos etal. (2012b) Interactive comment on “Comment on: “Possible source of ancient carbon inphytolith concentrates from harvested grasses” by G. M. Santos et al. (2012)” byL. A. Sullivan and J. F. Parr. Biogeosci. Discuss. 9, C6114 e C6124. www.biogeosciences-discuss.net/9/C6114/2012/bgd-9-C6114-2012.pdf.

Santos et al. (2012b) Interactive comment on “Comment on: “Possible source of ancient carbon in phytolith concentrates from harvested grasses” by G. M. Santos et al. (2012)” by L. A. Sullivan and J. F. Parr. Biogeosci. Discuss. 9, C6114eC6124. (www.biogeosciences-discuss.net/9/C6114/2012/bgd-9-C6114-2012.pdf).

Santos et al. (2016) From radiocarbon analysis to interpretation: A comment on “Phytolith Radiocarbon Dating in Archaeological and Paleoecological Research: A Case Study of Phytoliths from Modern Neotropical Plants and a Review of the Previous Dating Evidence”, Journal of Archaeological Science (2015), doi: 10.1016/j.jas.2015.06.002.” by Dolores R. Piperno, Journal of Archaeological Science 66, 36-43, DOI: 10.1016/j.jas.2015.11.012

Interactive comment on Biogeosciences Discuss., 12, 15369, 2015.