Biogeosciences Discuss., 11, C6306–C6307, 2014
www.biogeosciences-discuss.net/11/C6306/2014/

Biogeosciences
Discussions
Open Access

Interactive comment on "New highlights on phytolith structure and occluded carbon location: 3-D X-ray microscopy and NanoSIMS results" *by* A. Alexandre et al.

A. Alexandre et al.

alexandre@cerege.fr

Received and published: 30 October 2014

We are grateful to anonymous Referee #1 for highlighting some points of weakness that needed to be expressed or discussed differently in our manuscript.

In a modified manuscript, we further distinguished conclusions, clearly supported by the SEM, 3D-Xray microscopy and NanoSIMS data, from suggestions we made for reliable assessments of the significance of phytC in atmospheric CO2 sequestration: In the discussion section we changed: "At the end of the cell silicification, residual cell organic compounds that were not already occluded may gather in a remaining space and delimitate the micrometric central cavities. This second pool of phytC should be

rapidly oxidized when phytoliths start to dissolve after their deposition in litter, soil or sediment (fig.09). This suggests that this phytC pool participates in a limited extent to long term atmospheric CO2 sequestration. These considerations rise the need to further estimate the respective contributions to C contents measured from bulk phytolith concentrates of (i) phytC in the silica structure, of (ii) phytC in the central cavities, and (iii) extraneous C that may remain on porous phytolith surfaces. This is a prerequisite for reliable assessments of the significance of phytC in atmospheric CO2 sequestration." In the conclusion section we changed: "These findings constitute a basis to further characterize the origin, occlusion process, nature and accessibility of phytC, necessary for assessing its significance in the global C cycle."

SEM, 3D-Xray microscopy and NanoSIMS images illustrated the main features commonly observed on Grass Short Cell phytolith types. The extent of these observations was reported in the "Material and method" and "Results" sections of the modified manuscript. However one may notice that each volume reconstruction from 3D-Xray microscopy required more than 20 hours of analyze which limited the number of particles that can be visualized (5 in the present study).

In the modified manuscript additional changes were made according to reviewer#1 detailed comments. They were underlined in grey.

Please also note the supplement to this comment:
http://www.biogeosciences-discuss.net/11/C6306/2014/bgd-11-C6306-2014-supplement.pdf

Interactive comment on Biogeosciences Discuss., 11, 14699, 2014.