Biogeosciences Discussions, 2, S1011–S1013, 2005
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Biogeosciences Discussions

Interactive comment on "Sources and transfers of particulate organic matter in a tropical reservoir (Petit Saut, French Guiana): a multi-tracers analysis using δ^{13}C, C/N ratio and pigments" *by* A. de Junet et al.

A. de Junet et al.

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Reviewer 4

Comment 49: I am surprised that there is little in the way of cyanobacteria in the water column, particularly in the reservoir. Reservoirs typically provide an ideal environment for cyanobacterial growth - stable water body, long residence time. If the finding is indeed true, it is a point worthy of discussion.

Reply: cyanobacteria are indeed absent in the water column of the Petit Saut reservoir. The same is true for many others phytoplanktonic groups, like diatoms for instance. This has been also previously reported from microscope observation by Vaquer et al. (1997) Picophytoplankton composed by Chlorophyceae totally dominate in the epil-

imnion. We feel that discussing why other phytoplanktonic groups in terms of their ecology, etcĚ is out of the scope of this paper.

Comment 50: Why was zeaxanthin not used as a marker for cyanobacteria? Did it co-elute with lutein and if so, this would affect the lutein estimates? Reply: On our system we normally achieve base-line separation between lutein and zeaxanthin with about 0.2 min difference between the maxima of both peaks. Zeaxanthin is also present in some Chlorophyceae and thus not unequivocal for cyanobacteria. We think that it is fine to use zeaxanthin as a marker for cyanobacteria in the absence of Chlorobiaceae, but we are highly hesitating to use it as a specific marker when samples are dominated by Chlorophyceae. We have adapted the text in the introduction as follows: “Some phytoplankton and photosynthetic bacterioplankton groups contain specific pigments that can be used as biomarkers. For instance, diatoms are revealed by the presence fucoxanthin (Jeffrey et al. 1997), cyanobacteria by scytonemin, myxoxanthophyll, echinenone and zeaxanthin (Jeffrey et al. 1997; Sinha et al., 1998; Hunsucker et al., 2001) and Chlorobiaceae by chlorobactene (Schouten et al., 2000). Chlorophyll b lutein and zeaxanthin are found in Chlorophyceae but also in terrestrial plants and aquatic macrophytes (Bianchi et al., 1993a).”

Comment 51: Discussions of differences in stable isotope signatures and C/N ratios between depths and sites should be treated with some caution as there was no replication. An example is on page 1175, line 15 where a high C/N ratio of 21 was found at 3m depth. Is it not possible that this could be an analytical or sampling aberration since no replicates were taken, rather than a real difference with depth? Reply: it is not true that there was no replication for stable isotopes and C/N ratio (see material and methods). At depth 3 meters, the standard deviation on three C/N analysis gave a standard deviation lower than 0.5. The measured value of 21 is really something happening in situ at this particular depth.

Comment 52: Typically figures and tables should not be directly referred to in the Discussion unless they are synthesis figures/tables. Reply: we don’t understand this com-

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ment. What is the utility of tables and figures if we should refer to them in the text?

Comment 53:Ţ On Page 1177 the authors suggest that the presence of pheo a in the sediment traps is due to biofilms. A mechanism for how biofilms enter sediment traps is needed. Is it not also possible that the differences between the water column and sediment traps signatures is due to the fact that sediment traps are integrating processes in the water column over time, while water samples represent a snapshot of the algal community. Algal communities are very dynamic and depending on the time of sampling the community could have changed significantly. Surely this may also explain the presence of _-carotene and scytonemin? Reply: we never wrote that pheo a in the traps were due to biofilms. This concerned the scytonemin. In the revised MS, we have considered more carefully these temporal changes, as asked by the three reviewers. See replies to comments 1, 2 and 21 by reviewers 2 and 3. Please note that biofilms are generally exposed to sloughing and that parts of biofilm may thus detach and become transported in the water column where these may sediment and be collected in traps. Note that scytonemin is characteristic pigment in sheaths of cyanobacteria, which are formed by attached cyanobacteria (biofilm types).

Comment 54: Page 1181, line 16 - the statement about the extreme diversity of aquatic POM is hard to understand. I am not sure what the authors mean by this. Reply: the conclusion and this particular sentence have been modified

Comment 55Ţ Page 1181, line 19 - the authors have not convinced me of the importance of TEP. It is an interesting theory but TEP was not directly measured in the study. Reply: This section about TEP has been considerably shortened. Refer to the replies to comments 12, 20 and 43 by reviewers 2 and 3

Comment 56:Ţ Much of Table 1 is repeated in Figures so I would question the need to include it. Reply: not all the information in table 1 is contained also in the figures. In addition, we refer 17 times to this table in the text, so we have chosen to include it.

Interactive comment on Biogeosciences Discussions, 2, 1159, 2005.