

Interactive comment on “The effects of biomanipulation on the biogeochemistry, carbon isotopic composition and pelagic food web relations of a shallow turf lake” by B. M. Bontes et al.

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Author's comment

Reviewer #2

We would like to start by expressing our gratitude for the work that reviewer 2 has done to evaluate our manuscript and the kind words on the contents of the current paper. His/her comments were very useful to improve the manuscript. Below we provide a detailed description of the adjustments we made (page- and line numbers refer to the 1st submitted on-line version);

General Comment: The second reviewer challenged and encouraged us to present

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our results in a more quantitative way. We had already investigated in detail the relationships between delta values of the carbon source, phytoplankton and zooplankton species by correlation- and mass balance analysis and we have given it a second try following the advice of reviewer 2. However, the large temporal fluctuations, missing data and limited level of replication complicated the overall picture, lowered the statistical significance and we did not find any significant correlations with ecological relevance. These large variations in isotope values within and between the plankton species made it difficult to draw strong conclusions. We have therefore adopted a more descriptive way approach and focused more on understanding the variation in the delta13C of the sources and the effect of primary production on the carbon cycling in the lake. Following reviewer #2 and reviewer #1 as well, in the revised version of the MS we present the temporal data of the fractionation (table 3) instead of the mean data. And also pH, CO2 and plankton data from before the biomanipulation are presented in appendix A. This will allow the scientific community to re-examine our data if governing factors will be identified in the future. In this revised version we include some simple mass balance estimates showing that most zooplankton, if not all species were generalists and probably supported by a mixed diet.

Detailed comments: Introduction; - As suggested by reviewer 2, the introduction is rearranged so that it focuses more on the use of isotopes, carbon cycling and the novel aspects of the study. The flow of the introduction has also been modified. - The importance of clearly defined source end members to trace carbon flows is mentioned.

Methods; - The sorted zooplankton was pyrolysed as a whole and no correction was used in the delta 13C value. In all cases raw delta 13C data were used except for the fractionation of the phytoplankton where we used an offset of 9 permille. - We clarified that specific fatty acids were used for all plankton (C18:n) except the diatoms (C20:5) and changed the term baseline in end members.

Results; - p 1006 line 9 was rearranged. - Unfortunately, we have no data (increased bacterial abundance or DOC) to confirm or refute the assumption that mineralization

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affected the depletion of DIC. - The figures, tables and appendices are now referred to properly in the text. - The results of zooplankton isotopes were rewritten and generalized so that we conclude that most, if not all species were generalists and were probably supported by a mixed diet. Also an short interpretation by mass balance was added.

Discussion; - The small paragraph at the beginning of the discussion was removed. - We rewrote the lines 11-16 on p.1012 and refer the findings to the appropriate authors now. - The part on p.1012 l.18 was rewritten and rearranged. - The relationships between the carbon sources and epsilon of the phytoplankton were studied by correlation analyses, but showed no clear relationships. As a result we make some general assumptions on the causes of variation in fractionation; between the phytoplankton species. - The formula on page 1014 l.6 is clarified and appropriate references are given. - Mass balance analysis was performed for the sources and consumers, but unfortunately we could not conclude that specific algal groups supported the zooplankton diet. Although we cannot be sure what causes negative delta13C values of Asplanchna, we give some alternatives at the end of the discussion.

Technical comments; We addressed all technical comments and corrected the sentences as suggested by reviewer 2. Here we refer to the main technical suggestions made by the reviewer; - Mean as well as the temporal variation of the delta13C of DIC and CO2 are given in the table a,b,c in appendix B; the mean values are merely included to indicate the main differences between -FW on the one hand and -W and R on the other hand. - Turbidity data is given as Secchi depth in figure 2a.

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