Review of the manuscript "Source and flux of POC in a karstic area in the Changjiang River watershed: impacts of reservoirs and extreme drought" by Li et al.

The paper reports elemental and isotopic data for organic carbon and nitrogen in suspended matter and sediments of the Wujiang River, an important tributary of the Changjiang River that flows into the Three Gorges Reservoir. The Wujiang River it self is affected by a cascade of reservoirs. The objective of the study was to identify the sources of organic matter in the Wujiang River, examine the impact of reservoir and calculate POC fluxes of the Wujiang River. One studied period was high flow (May) and the other in August, during summer drought. Although the results might be relevant to understand the impact of dams on organic matter drained to Three Gorges Reservoir and Changjiang River, it is hard to follow the argumentation and the characterization of organic matter sources at this stage. The paper thus needs drastic re-organization before any re-submission.

(1) One objective of the paper is to study the impact of dams on the organic matter carried or settled in the Wujiang. However, it is not easy to identify how dams affect sampling parameters. Fig. 4 is important but not easy to read. I suggest a diagram comparing the quantitative variations of studied parameters along the river course (as a function of distance) for the two studied periods with the position of dams marked. The points that are considered as directly affected by reservoirs could be clearly identified on Figs. 4, 8, not only in Table 2. It might be more realistic to distinguish points that directly affected by reservoirs and those less affected, rather than "affected" and "unaffected" points. All points are probably more or less affected by the cascade of reservoirs.

(2) The authors used combined DIC δ^{13}C, C/N and δ^{15}N results to identify the source of organic matter.
As shown by the diagram of Fig. 5, there are more than two possible sources. It is thus not clear how the authors made simple quantitative mixing models between phytoplankton and C3 plants, and between C3 and C4 plants on the basis of δ^{13}C alone (results shown on Fig. 6). Most δ^{13}C in Fig. 5 are consistent with a dominant C3 plant source (after given into account the variability of the C3 plant source). The most enriched points most possibly reflect C4 soil plant input and the most depleted one phytoplankton input. It is however not possible to make quantitative estimations (on the basis of δ^{13}C alone) as three possible sources are mixed.
The identification of the phytoplankton end-member in the text is confusing. It is stated that it can be measured on the basis of dissolved DIC δ^{13}C and fractionation factor of -21%(page 6, lines 10-11). A calculated range (?) of -32,6 to -24,4‰ was given although not DIC δ^{13}C have been given. They could be supplied as supplementary material if available. It is also stated that phytoplankton δ^{13}C is lower then 30‰ (page 6, line 5), then that it has a typical range between -42 and -24‰ (page 6 line 13).
An average δ^{13}C of -13,4‰ is given for C4 plants in the catchment from Tao et al. (2009) (page 6, line 24), but the sigma value (with reference) is not given. The exact values and references (published in English) for the average and sigma values of C3 fresh plant and soil end-members (shown in Fig. 5) were not given. Note that the average δ^{13}C values for C3 plants (ca. -28‰ from Fig. 5) seems a bit more depleted than expected. If

measurements exist for the main C3 plants in the catchment are available, they could be added as supplementary material.
Fig. 5 clearly shows a set of points with high C/N, suggesting an important contribution of fresh terrestrial plant material, essentially from C3 plants. This point is not discussed.

(3) The discussion on sediments $\delta^{13}C$ is not easy to read.
As shown by the authors (Fig 5, 8 and page 7 lines 10-19), the sediments are enriched in ^{13}C (relative to suspended sediments). The authors proposed that there is a relative increase in C4 plant debris in the sediment or preferential loss of light isotopes in the sediment (lines 13-4) and then later proposed a preferential biodegradation of the phytoplankton in the water column (lines 16-17). These three possible options are not discussed.
The $\delta^{13}C$ sediment/suspended sediment plot was introduced later (page 8, lines 14-15) and can be useful in that part of the discussion.

(4) It is not clear why the positive relation between POC and TN (total nitrogen) suggested that a fraction of nitrogen is inorganic (page 5 line 24; page 7 line 5-6). One would expect indeed a positive relation between POC and particulate organic nitrogen, with the slope depending on organic C/N ratio. It could also be useful to specify the possible inorganic forms of nitrogen in sediments and suspended matter.
$\delta^{15}N$ is considered as a tracer of POC source throughout the text (see page 5, line 19 among others). It is actually a tracer of nitrogen source and by consequence of organic matter source.

(5) The discussion of $\delta^{15}N$ is confusing (page 8, lines 1-10).
To explain the variation in $\delta^{15}N$ in suspended matter, the authors refer to dissolved nitrate $\delta^{15}N$ (Fig. 8a). These data are however not given in Table 1.
They used these data to assess that high $\delta^{15}N$ of N in suspended sediments indicated manure and domestic sewage (page 8, lines 1-2), but then to confirm nitrogen input from phytoplankton (line 4-10). The importance of sewage organic matter / phytoplankton N derived from sewage- nitrate is not at all discussed.
The authors stated that the enrichment on ^{15}N of organic nitrogen in dam-affected reservoir is consistent with increased input of phytoplankton nitrogen. However this enrichment does seem significant (7.99±4,12 / 7.42±2.49).
Furthermore, the good correlation between ^{15}N in sediment and suspended matter (Fig. 8c) is not really discussed. Relative high $\delta^{15}N$ values are observed in both the sediment and suspended sediment. This is not in agreement with previous assumptions made by the authors that high $\delta^{15}N$ is essentially tied to the phytoplankton input and that phytoplankton is mainly decomposed in the water column. This might suggest an enriched source of “recalcitrant“ N or an incorporation of phytoplankton-N in recalcitrant sediment nitrogen.

(5) Figures (3, 9 and may be 7) and tables (1, 3, 5) might be supplied as supplementary materials. The information from table 2 can be given in the text. It is better to put the measurements for a given site on one given line in Table 1. For Fig. 6, see above point 2.

(6) I suggest a revision of the paper by native English speaker.

Minor comments

page 1, line 27 “characterized” instead of charactered
page 1, line 30 “tracer of particulate organic matter “ instead of “tracer of POC”
page 2, line 6-5 “Moreira-Turcq” instead of “Moreira”, “Aucour” instead of “Ancouret”
page 2, line 8 “flows into” instead of “empties”
page 2, line 29 “whereas” instead “.Whereas”
page 3, lines 12-13 ; It is not clear how freeze-dried filters with suspended sediments could be separated to calculate the mass of suspended matter and sieved to 200 mesh.
page 3, line 20 “where” instead of “Where”
page 3, line 18 The measurements have been made at the Chinese Academy of Forestry. The name, location of laboratory coudl be given as it does not appear in affiliations.
Page 3 line 30 “sedimentation” instead of “precipitation”
Page 4 line 3 “Elemental and isotope composition” instead of “composition of element and isotope”
Page 4 line 8 and throughout the text “cascade of reservoirs” instead of “cascade reservoirs”