

## ***Interactive comment on “Amino acid composition and $\delta^{15}\text{N}$ of suspended matter in the Arabian Sea” by B. Gaye et al.***

### **Anonymous Referee #2**

Received and published: 20 August 2013

The manuscript entitled “Amino acid composition and  $\delta^{15}\text{N}$  of suspended matter in the Arabian Sea” authored by Gaye et al. addresses scientific questions that are well within the scope of the BG. The combination of nitrogen isotopic data and amino acid composition helps in better understanding of how particulate organic matter evolves during its movement between euphotic zone and deeper depths of ocean. Scientific methods and assumptions used in this work are valid and clearly outlined. Description of experiments is sufficient, however, reproduction of principal component scores can be done only if amino acid data are made available, perhaps as supplementary material. Authors give proper credit to related works and the overall presentation is well structured and clear. Mentioned below are some scientific issues and technical corrections that should be addressed by the authors to improve the manuscript:

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Water samples were collected from 14 locations, which have been discussed in various combinations or groups throughout the manuscript. It will be very helpful if somewhere in “Material and Methods” section, the basis of these combinations or groups is clarified.

Lines: 178-183: Discussion of  $\delta^{15}\text{N}$  has been divided into 3 depths (<100 m, 100-150 m, >150 m), however, the basis of this division is not clear. Instrumental bias may be not significant, but what about depth effect ?

Lines 225-230: already established indicators DI and RI were examined but they yielded no meaningful information in this study. How about trying the labile OM index (LI) that was proposed by Gupta and Kawahata (2007) in Journal of Oceanography, vol. 63, pp. 695-709.

Lines 250-252: a visual comparison of the data is difficult unless some color scheme is used in the Fig. 5, or preferably some statistical method be used to highlight the difference in AA compositions in SPM and sinking particles.

Lines 293-307: sorption of AA and OM on particles is a tempting process for explaining the observed variations in the AA composition. However, no experiment was conducted by the authors to examine the sorption directly. So the conclusions mentioned in this section remain speculative, and should be verified by detailed experiments in future.

Lines 340-348: although the equations are provided, it is not clear how instantaneous product differs from accumulated product in terms of nitrogen isotope. If this difference is too small, it may lie well within analytical error range.

Lines 363-364:  $\delta^{15}\text{N}$  of sinking particles is not immediately clear in the Fig. 7.

Line 373: it will be good to specify in which month or season or monsoon, productivity is high.

Amino acid was abbreviated as AA in the abstract and in line 152, but the term “amino acid” was used frequently, which can be avoided by using the abbreviation AA through-

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out the manuscript.

Line 108: replace SW by southwest (SW)

Line 133: replace Organic carbon (POC) by Particulate organic carbon (POC)

Line 155: replace remaining acid by unreacted HCl

Line 157: insert AA between individual and monomers

Line 188: delete between 27 and 597  $\mu\text{g l}^{-1}$

Line 189: delete respectively

Line 200: delete organic

Line 224: correct  $\beta$ -Al as  $\beta$ -Ala

Line 365: delete processes

Line 367: insert space, 1996).In  $\rightarrow$  1996). In

Line 378: change appears to appear

Line 403: change Water to waters

Lines 703-706: avoid units to simplify the text. Units are mentioned in the table.

Line 728: change samples to samplers

Lines 723-733: avoid units to simplify the text. Units are mentioned in the Figs.

Table 2: important AA, loadings and scores should be shown in bold font

Fig. 1: Make station numbers more prominent by using larger font or different color

Fig. 2b: x-axis title, change from organic carbon to particulate organic carbon

Some references have been listed as et al. (lines, 493, 511, 513, 516, etc.). These should be mentioned in accordance with the BG format of references.

**BGD**

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