

## **Review: Uptake of phytodetritus by benthic foraminifera under oxygen depletion at the Indian Margin (Arabian Sea)**

The paper by Enge et al., reports results from an in situ isotope labeling experiment ( $^{13}\text{C}$ ,  $^{15}\text{N}$ ) of benthic foraminifera at the western continental slope of India to investigate the response by benthic foraminifera to pulsed food delivery under extremely severe oxygen concentrations of less than  $0.1\text{mLL}^{-1}$ . Although similar in-situ feeding experiments were conducted in the Arabian Sea including within the OMZ, none of them were carried out under almost anoxic conditions, which is the novelty of this work. This paper contains very interesting data which are totally suitable for publishing in Biogeosciences. The manuscript is well written, well organized and well illustrated. Most of my questions were answered progressively while reading the manuscript. The abstract is concise yet informative and the authors show adequate awareness of previous work. I heartily send my congratulation to all of the authors and I do recommend his publication in Biogeosciences Journal after minor revision. My suggestions for changes are provided below.

### **Introduction:**

Page 15308, line 29: Please give the references for the existing literature on feeding experiments

Page 15309, lines 7-12: Write the diatom species name entirely as it is the first time mentioned.

The objectives of this work need to be more explicit: simple biological quantification of foraminiferal consumption of phytodetritus under anoxic conditions? Determination of opportunistic behavior of certain species? Why do you use  $^{15}\text{N}$ ? Quantification of the role of foraminifera in these anoxic environments in carbon cycling?....

### **Material and methods:**

Page 15309, lines 19-20: A localization map of the site would be helpful

Page 15310, line 2: You should add the values of PP during the sampling period (satellite images)

Page 15311, line 25: That is very approximate as the tests may be filled with cytoplasm while individuals are dead, especially in those environments with very little oxygen. A more accurate method would have been to observe pseudopodia deployment or to assess their vitality by placing them on sterile sediment; those who have moved leave a track of their

movement on the sediment. Can you please specify the bias that this uncertainty could have on the values?

Page 15314, line 1: Can you please explain in material and methods how do you exactly estimate foraminiferal biomass?

### **Results:**

Page 15314, line 9: The living population density is surprisingly high. In the area (Jannick et al. 1998, Kurbjeweit et al., 2000; Schumacher et al., 2007; Caille et al. under discussion in BG), the foraminiferal standing stock from the >125 $\mu\text{m}$  fraction don't exceed 1000 ind./50cm<sup>3</sup> at similar depths and within the OMZ. How can you explain the extremely high densities you are recording? Could it be an over estimation from live-dead determination? Specific ecological conditions in the sampling area?

Page 15314, line 13: How can you quantify the uptake of phytodetritus studying only the >125 $\mu\text{m}$  as much more forams are found in the smaller fractions?

Page 15315, line 3: Please, mention the method in material and methods

### **Discussion:**

Page 15316, line 21: So the oxygen is not a limiting factor for foraminifera in these environments as suggested in earlier studies

Page 15325, line 18: Remove the comma after nematodes

Page 15325, line 25: You said earlier that macrofauna were absent!!!!

Page 15326, line 12-15: Change the phrasing

Page 15327, line 13: I don't understand. The dual labeling was applied to the same batch of diatoms introduced in the in-situ experiments. So the difference in uptake between C and N should be equivalent to the original difference in the labeled food? Do you mean that the mechanisms within the cell favored more C than N? Please make this sentence clearer

### **Conclusions:**

There is no conclusion about C/N ratios