

Interactive comment on “Uptake of algal carbon and the synthesis of an “essential” fatty acid by *Uvigerina ex. gr. semiornata* (Foraminifera) within the Pakistan margin oxygen minimum zone: evidence from fatty acid biomarker and ¹³C tracer experiments” by K. E. Larkin et al.

Anonymous Referee #2

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An interesting manuscript on the role of *Uvigerina ex. gr. Semiornata* in the cycling of fresh POC at the seafloor under low oxygen, and potential de novo EFA synthesis in this species.

The ms confirms the central role foraminifera can play in OM cycling at the OMZ-impacted sea floor. This in itself is not new, but data are still sparse and therefore well worth publishing.

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The introduction is written well and gives a clear and concise overview of the state of the art and research question. At the same time, I felt some parts of the manuscript might benefit from modification/ clarification.

In particular, I feel the authors are perhaps a bit overenthusiastic in their choice of a manuscript title, that claims to present evidence for the de novo synthesis of EFA by the foraminifera under study. While the data presented support this hypothesis, I do not believe they present conclusive evidence and in the discussion the authors themselves acknowledge this and tread far more carefully.

Specific comments:

It appears that different amounts of ¹³C labelled detritus (C per m²) were added in the ex situ and in situ experiments. What was the rationale for this ? It seems to unnecessarily complicate comparison between the two sets of experiments ?

With regard to the single in situ incubation performed, the term ‘time series’ does not seem adequate and should be deleted. Also, with only one chamber experiment performed, where did the 2nd in situ replicate come from (l15 p 260) ? Where both cores taken from the same experimental chamber ? If so this should be clearly stated.

At such low oxygen concentrations, an accurate maintenance of DO is central to the experimental design. It needs to be explained how oxygen concentration was maintained in the in situ experiment – at such low DO, the lander chamber would have become anoxic quickly without regulation, and maintenance of ambient DO with a passive, gradient-driven system is not easy due to the low ambient DO and hence shallow gradient. It is thus particularly important to either include or refer to the O₂ time series readings from the lander chamber (the paper cited in this context is a broad overview paper that does not give any details).

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