

Interactive comment on “²¹⁰Pb-²²⁶Ra chronology reveals rapid growth rate of *Madrepora oculata* and *Lophelia pertusa* on world’s largest cold-water coral reef” by P. Sabatier et al.

Anonymous Referee #2

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Sabatier et al. present the application of ²¹⁰Pb-²²⁶Ra age determination on cold-water corals *Madrepora oculata* and *Lophelia pertusa* collected from Røst Reef on the Norwegian shelf. The study is very interesting and data is novel and worth for publication after moderate modifications. The list below indicates more detailed comments and suggestions. In general, the language should be checked by the native speaking co-author as still a lot of grammatical mistakes are present.

I would like to see a more detailed discussion on the cleaning procedure, especially on the degree of contamination through boring organisms on dead coral parts making it difficult to use those specimens for detailed geochemical analyzes (e.g. Beuck et al.,

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2007, *Facies* 53:157–176, DOI 10.1007/s10347-006-0094-9). Furthermore, different species are also discussed to tolerate different levels of environmental parameters. E.g. Wienberg et al. (*Deep-Sea Research I* 56 (2009) 1873–1893) present data from the Gulf of Cadiz, where *M. oculata* seems to have a higher tolerance to environmental changes compared to *L. pertusa*. This should be also considered in the discussion of comparison between *L. pertusa* and *M. oculata* data.

Detailed remarks:

12250/16: Söffker et al.

12251/27: Frank et al. 2011 not in reference list

12252/22: "ARK XX11/1a" should be "ARX XXII/1a"

12252/25: "self" should be "shelf"

12252/27: link to figure 1 is wrong, there is no map, re-number figures in the following text after adding the map including the position of the Røst Reef as figure 1

12254/10: ...sample volume...

12256/4: ...to determine the growth...

12256/9: ...²²⁶Ra allows to...

12257/2-3: you could delete "for *M. oculata*" and "for *L. pertusa*" as it is explained on p. 12253

12257/21: "polyp 12.5" - replace comma with dot – do the same also in figures 4, 6 and 8

12258/15: thought, not throught

12258/18: ...from the top. All...

12259/25: ...parasites...

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12259/26,27: ...mucus...
12260/4: ...Whatever the incorporation mode is...
12260/7-8: ...in which the coral grows...
12260/12: ...the classic use of the excess method...
12260/15: ...Dodge and Thomson (1974),...
12260/15-16: check sentence for grammar
12260/20: ...whatever the incorporation mode of these radio elements is.
12261/24: ...from 99.1 pM C to 105.6 pM C.
12261/25: ...indicates...
12262/2: ...of intermediate waters...
12262/4: M. oculata coral is less than 60 yr old.
12262/13: subscribe "ex" in 210Pbex
12262/15: subscribe "ex" in 210Pbex
12263/2: These values...
12263/4: subscribe "ex" in 210Pbex
12263/7: subscribe "ex" in 210Pbex
12263/9: cold-water
12263/10: ...chronology and (2) less evident to...
12263/15: ... (Fig. 4).
12263/19: subscribe "ex" in 210Pbex
12263/23-24: Such a correction model brings... and allows...
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12263/24: blue not bleu
12263/24: subscribe "ex" in 210Pbex
12263/27: $r^2 = 0.85$
12264/1: check sentence "however it older..."
12264/3: ...we do not take into account the...
12264/7: ...we can not make...
12264/9: ... Mn correction remains...
12264/15: delete "old"
12264/21: 5 polyps yr-1,
12264/25: 11.2 mm yr-1
12265/12: growth
12265/13: ...measurements gave mean growth rates...
12265/16: They explained... instead of "Brooke and Young, (2009) explained..."
12265/17: species
12265/20: 0.33 polyps yr-1
12266/13: rates expressed in mm per year or polyp generation per year.
12266/15: 0.2 polyps yr-1
12266/16: ...specimen. However, the relatively high...
12266/19-20: 1.6 ± 0.3 polyps yr-1. But this simple correction does not take into account for the...
12266/22: polyps yr-1

12266/24-27: Split sentence - too long and not straight-forward

Is it "210Pb-226Ra" or "226Ra-210Pb" method / chronology / excess method? Different in title-abstract-conclusion

12270/8-9: not cited in text

12271/9-11: not cited in text

12271/29-31: not cited in text

12279: replace commas with dots in figure

12280: ...and excess model (1+2).

12281: replace commas with dots in figure, use "polyps yr⁻¹" as unit

12283 replace commas with dots in figure, use "polyps yr⁻¹" as unit

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