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Biogeosciences Discussions

Interactive comment on "High frequency Barium profiles in shells of the Great Scallop *Pecten maximus*: a methodical long-term and multi-site survey in Western Europe" *by* A. Barats et al.

Anonymous Referee #2

Received and published: 19 October 2008

Review of the ms: bgd-2008-0113;High frequency Barium profiles in shells of the Great Scallop Pecten maximus: a methodical long-term and multi-site survey in Western Europe; authors: A. Barats, D. Amouroux, L. Chauvaud, C. Pécheyran, A. Lorrain, J. Thébault, T. M. Church, O.F.X. Donard

General: This study focuses on [Ba]/[Ca] profiles in Pecten shells and aims at clarifying the biogeochemical processes influencing the episodic sharp peaks of ([Ba]/[Ca]) ratios, a feature that has been reported in the literature for different other bivalve species.

While this study highlights that a biogenic process related with phytoplankton development initiates the enhanced uptake of Ba in shells, the exact process remains obscure.

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Interactive Discussion
Discussion Paper

The work is interesting and important by the extent of the data set (several years, different sites) confirming the ubiquitous occurrence of brief high Ba/Ca excursions in Pecten shells, rather than by improving our understanding of the process ongoing.

My main concern is the poor style of the writing. The paper looks like written in a haste and the English overall is poor. There really is need to improve style and grammar; in its present form the paper should not be published. I have not systematically highlighted poor style and grammar but some examples are included in my specific comments below.

Specific comments: Abstract: 1st sentence .. (2year old; 3shells/year) move underlined info to next sentence

Introduction: Line 15: SWI: seawater interface define differently, e.g. as sediment water column interface

Lines 5 to 10: Ba in estuaries is high not only because of release from particles and ground water input, but also simply because rivers have more dissolved Ba than the ocean. Also: it would be appropriate to cite also Fritz et al. (1990) here. (Fritz et al., 1990, Biomineralization of barite in the shell of the freshwater Asiatic clam Corbicula fluminea (Mollusca: Bivalvia), L&O, 35, 756-762.)

M&M Line 5: different ecological characteristics; .. such as ? specify

Section 2.2, page 3672 Line 25: it would be interesting to check the organic matter content of the shell.

Section 2.3, page 3673 Line 20: Ba, Mn in dissolved seawater ... ? Line 25: please provide more details about your method for dissolved barium Line 26: analysis of suspended matter .. the acknowledgements state this was done at RMCA, please mention this in text as well.

Page 3674 Line 8, correct NO2+

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5, S2013–S2015, 2008

Interactive Comment

Results & Discussion Page 3676 Line 15: Ba/Ca profiles were then compared to those previously reported in 2003 ... this sentence is unclear; which ones previously reported? by Gillikin 2008? Or is this redundant with previous sentence ?

Page 3677-3678 Line 28 continued next page: High Ba/Ca in mussels and clams; mussels have both calcite and aragonite; mention for these literature data in which layer Ba/Ca was measured; Gillikin et al. 2006, mention sampling of the calcitic layer ..

Page 3678 First line to line 15: you explain the high Ba/Ca ratio in mussels as possibly due to use of non-matrix matched standards. Gillikin et al. 2006 describe that a carbonate standard was used (MACS, USGS).

Page 3679: Lines 1 to 5: the background Ba/Ca ratio in dissolved seawater in 2000 is about 5.2 μmol/l = example of uncareful writing

Page 3680 Line 1: Is particulate Ba = total Ba, or corrected for lithogenic Ba ? Lines 8 to 12: text does not make sense ..

Line 15: shell growth decrease due to lower SST in spring and summer .. ? explain these decreased SST in spring and summer

Page 3681 Line 8: For the other year which one ?

Page 3682, Table 3: This Table needs more discussion. The reason why a variable time window was selected for POC, PON, Chl when comparing with Ba/Ca peaks is barely discussed, and also the results shown in Table 3 need a more through discussion.

Table 1: the explanation associated with the * underneath the table is unclear Figure 1: says map of the investigated area, but no map for Loire, Vigo Figure 2: Mo is mentioned in legend .. explain Figure 3: Clarify what is what Figure 4: two sharp peaks of dissolved barium (up to 100 nM); such concentrations are unusual except in deep ocean or river water; explain

Interactive comment on Biogeosciences Discuss., 5, 3665, 2008.