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Discussions

Interactive comment on "Shell chemistry of the Boreal Campanian bivalve *Rastellum diluvianum* (Linnaeus, 1767) reveals temperature seasonality, growth rates and life cycle of an extinct Cretaceous oyster" *by* Niels J. de Winter et al.

Johan Vellekoop (Referee)

johan.vellekoop@kuleuven.be

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The study of de Winter et al. presents interesting trace elemental and stable isotopic data from a set of Rastellum diluvianum specimens from the famous Campanian locality of Ivo Klack. The new datasets highlight both the potential of these kind of studies, and the complexity of interpreting trace elemental data. The authors have generated a wealth of data, providing valuable insights in the age of the Ivo Klack deposits (Sr isotopes), the local temperature seasonality (oxygen isotopes) and in the physiology of the studied oysters (carbon and oxygen istopes and elemental data). At the same

time, the complexity of the incorporation of trace elements in mollusk shells limits the usability of large parts of their data. The authors do a good job in highlighting this complexity, and show that, while sometimes elemental records of mollusk show cycling patterns, we are a long way away from successfully developing truly applicable proxies based on this time of data.

While the text is a bit lengthy, and some of the figures are rather complex, overall, this is a well-written manuscript. The authors have generated a substantial dataset, convincingly show that the studied specimens are well-preserved and provide interesting insights in the local climatic conditions at Ivo Klack. Their arguments are solid and their conclusions are sound.

Content wise, my only comments would be on the limited discussion on the possibility of a seasonal variability in d18O of seawater at Ivo Klack. They pass over this issue a bit too hastily, in my opinion. How is the assumption of a constant d18O of seawater justified? Wouldn't such a coastal site be susceptible for seasonal changes in riverine input? Particularly since the fennoscandian shield is usually placed in a wet/temperate climate belt, in Late Cretaceous climate reconstructions. The reference provided by the authors (Thibault et al., 2016) concerns a study on the chalks of the Stevns-1 core, which represents a much more distal site than Ivo Klack. Now, I realize that the authors are limited here, because constraining d18O of seawater is not easy, and I don't disagree with most of their general conclusions, but it would behoove them to acknowledge their uncertainties in this issue.

Apart from this, all my comments and suggestions are relatively minor. Therefore, I recommend this manuscript to be accepted with minor revisions.

Please also note the supplement to this comment:
https://www.biogeosciences-discuss.net/bg-2019-74/bg-2019-74-RC1-supplement.pdf

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