

## Comments & suggestions:

**P2, L54:** What does the “it” in this sentence exactly refer to? The Late Cretaceous cooling trend?

**P2, L57-59:** In the 90’s chalk was still considered to record sea surface conditions faithfully. Over the last decades, this viewpoint has changed. Most chalk consists of recrystallized material. As a result, d18O values usually result in much lower temperatures, e.g. resulting in the (apparent) Cool Tropics Paradox. I advise the authors to read up on this. The values recorded by Jenkyns et al. are in all likelihood a large underestimation of SSTs (with even Cenomanian-Turonian values still below 28 degrees...). In reality, Cretaceous SST’s were probably much higher. See for example the review paper of O’Brien et al., 2017.

**P2 L67-68:** With a Tethys ocean still present, a Panama corridor still present and closed-off Tasman and Drake Gateways, I wouldn’t state that the continental configuration is “relatively modern”. Yes: apart from India, most continents were already close to their present-day position, but from a climatological and paleoceanographical perspective, the Late Cretaceous continental configuration was widely different. Of course, this does not mean that the Campanian could be considered an interesting analogue. I just would not play the continental configuration card.

**P2 L73-75:** Does the data represent a fundamental component of the climate system? Or the seasonality? Please rephrase.

**P3 L93 “The incorporation of these chemical proxies into bivalve shells...”:** This is a confusing sentence. Are the authors discussing the application of proxies on bivalve shells? Or are they concerned with the incorporation of chemical signals into bivalve shells?

**P3 L109-126 “The Kristianstad Basin...”:** This paragraph feels a bit misplaced. There is a large jump from the previous paragraph (on the value of mollusks as archives of seasonality ) to this one (on the Kristianstad Basin). I think this paragraph would better fit directly after the first paragraph of the Introduction. The first paragraph of the section ends with the notion that Late Cretaceous seasonality records from high latitudes are scarce. This could very easily be followed by “The Kristianstad Basin in Sweden provides a great potential for such a high latitude seasonality records. Particularly the Ivo Klack site, located on the southeastern Baltic.... Etcetera).

**P3 L110-112:** suggestion: “The coarsely latest early Campanian shallow marine sediments deposited at Ivö Klack consist of sandy and silty nearshore deposits containing carbonate gravel (Christensen, 1975; 1984; Surlyk and Sørensen, 2010; Sørensen et al., 2015).” (to avoid a confusing “and are..” construction.

**P3 L114:** maybe start a new sentence on the paleolatitude.

**P3 L115:** no glaciotectionic movements in this region?

**P3 L124:** I presume “original shell material “ only refers to the calcitic material? Or is aragonite also preserved?

**P7 L195:** TSR and TSA are not specified. What do these abbreviations stand for?

**P8 L243-244:** what percentage of samples were run in duplicate?

**P11 L340-346:** There are a lot of ‘allows’ in this paragraph. Maybe rephrase a sentence or two?

**P11 L358-360:** This sentence is slightly confusing because the “(deeper waters)” directly follows the “bivalves”. This reads as if the bivalves live in deeper waters, rather than the belemnites. Please rephrase.

**P13 L388-389:** 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.

**P13 L394-396** “Superimposed on these changes, a statistically significant ontogenetic trend can be discerned in the d13C records of 10 out of 12 shells. However, the scale and direction of these trends do not seem consistent between shells.”:

(1) I understood that only 5 of the 12 specimens were measured for isotopes? How can the authors have d13C data on all 12 shells? In table 1, only the 5 specimens are mentioned, of which 3 out of 5 seem to have a statistically significant trend? It looks like something got mixed up here

(2) Please insert a reference to Table 1 here. This was not immediately clear from the text.

(3) I am intrigued by the difference in the direction of supposed ontogenetic trends. On the other hand, the only shell with a negative trend doesn't show a statistically significant trend....

**P13 L403:** Supplementary file S10 seems to be missing from the supplements

**P16 L451-453:** Is anything known about annual variations in growth rates in modern oysters? Do they respond to food availability? Could this be an early spring phytoplankton bloom? Or some other environmental parameter? Or is there a relationship with something like spawning?

**P20 L568:** salinities are usually not indicated in g/kg, but either in psu or in ‰

**P21 L600:** “as well as” should be replaced by “including”, since bivalves with symbionts are also marine or freshwater bivalves.

**P22 L644** “because not all seasons contributing to the average have long growing seasons”: seasons having long growing seasons? This is a confusing sentence. Please rephrase.

**P23 L696-698:** Why would oysters need to compensate for lower ambient Sr concentrations? What is the benefit of building Sr into their shells? How does this help to compensate for lower seawater Sr concentrations?

**P24 L774-782:** Is anything known about the spawning season of modern oysters? Maybe the authors could discuss how similar or dissimilar their results are.

**P25 L819-832:** The notion of a spring supply of freshwater, bringing in nutrients, causing a spring phytoplankton bloom, is somewhat conflicting with the assumption of a constant d18O of seawater, discussed in lines 388-389. Note to the authors: at modern day mid- to high latitudes, the spring bloom is often triggered by storm-induced mixing. A spring bloom is not necessarily related to riverine input of nutrients. It could be related to changes in mixed-layer depth as well..

