

Review of: “Stable isotope study of a new chondrichthyan fauna (Kimmeridgian, Porrentruy, Swiss Jura): an unusual freshwater-influenced isotopic composition for the hybodont shark *Asteracanthus*” by L. Leuzinger et al.
Review by R. Amiot

The manuscript by Lea Leuzinger and co-authors is dedicated to interpret a large dataset of oxygen isotope composition of fish tooth phosphate ($\delta^{18}\text{O}_p$) in terms of ecology of the hybodont shark *Asteracanthus*.

They show that this peculiar shark found in marine deposits may have lived at least temporarily in brackish environments, based on measured very low $\delta^{18}\text{O}_p$ values of their teeth. Overall, the manuscript is very well written, the interpretations are globally sound and well illustrated. One major point, however, needs to be properly discussed before this manuscript could be recommended for publication in BGD: the assessment of original isotopic preservation. This is really the key parameter that may allow to confidently interpret anomalous values in terms of original ecologies or environment, and should constitute a first paragraph in the discussion. In particular, comparison between enamel and dentin should be more discussed and maybe presented in a graph, and comparison between expected ecologies of each fish groups with measured values may hint to preservation or not of primary isotope compositions.

It would be also more convenient for the reader if, in the data table, enamel and dentin samples of the same individuals are grouped.

The second point that intrigues me is the value range for pycnodontiformes, somewhat larger than that of *Asteracanthus* samples. If we consider that *Asteracanthus* migrated to brackish or freshwater environments, it would explain indeed the low values in some samples as well as the large range in $\delta^{18}\text{O}_p$ values. Then what is the meaning of such a large range in Pycnodontiformes? Could it be related to peculiar ecologies? Could it be related to more fluctuating climatic or environmental conditions during the deposition of the considered sedimentary layer?

Related to this point, Figure 4 shows that pycnodontiformes of Porrentruy and Solothurn are not synchronous with *Asteracanthus* values of the same locality. Values should be put on the same level or it must be notified in the caption that for an easier reading, values have been slightly shifted.

Concerning other points on the manuscript, I totally follows the comments made by the first referee Dr. Fisher, and I look forward to seeing theses points corrected or discussed properly. I am confident that this manuscript will provide important insights into the ecology of sharks and associated fish within the peculiar environments of Europe during the Late Jurassic.

I hope that these comments will help to improve this manuscript.