

# Review of: "Cambrian Chordates and Early Fin Evolution"

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**Potential competing interests:** No potential competing interests to declare.

Cambrian chordates and early fin evolution by Mark McMenamin should not be published because it is not about the origin of chordates and does not contribute to our understanding of the evolution of chordate fins.

The introduction is extremely wordy, not to the point and contains outdated statements and some mistakes.

The first paragraph shows already that wishful thinking is involved in what comes next.

The next paragraph speculates about the evolution of the chordates as deuterostomes during the Cambrian Explosion. The viewpoint that there was such an explosion is outdated (see Wood et al. 2019). The argument that during the embryonic stage 'the alimentary system must flow one direction or the other' is not based on proper knowledge of the process of gastrulation.

The word for a structural body plan is 'Bauplan' and not 'baüplan'. It is not a typo because it is repeated throughout the paper.

It is not clear why early fishes are reviewed here because these are clearly already vertebrates and this paper is on chordates expected to be of an earlier period.

The remarks about the Yunnanozoans contains a strange reference to a person who is not the first author of the article. The mention of the university here is also odd.

The last paragraph announces the key point of this paper: new information about the structure of the holotype earlier described by McMenamin.

Materials and methods are extremely brief and do not explain which mechanical preparation tools (or tool) was used for 'the gently scraping' action. Nothing about magnification used or how the matrix was distinguished and subsequently could be separated from the fossil. No mention is made for the reason to use SEM and no information is given about the SEM technique used in this case.

Results are also not very revealing and contain interpretations that should be part of the discussion. Why was the dorsal fin spine not recognised during the previous study of the holotype? The reconstruction in figure 3 suggests the existence of a pointed dorsal fin and no new preparation in that region took place. Why is the structure near the star now interpreted as a dorsal spine exceptionally at the caudal side of a dorsal fin?

The 'possible possible ventral fin ray box' (a name used in the text and in the caption of figure 1) does not show any characteristics, not even in the SEM magnification of figure 2. So why does the author think this nondescript structure is a ventral fin?

The discussion starts with a discussion about an inaccurate reconstruction (not shown) and a possible improved version by the author shown in figure 3. (The second mention of Figure 3 should be Figure 4).

The final reconstruction suggests several kinds of structures that are not explained in detail.

Nor is the actual proof for the existence and function of these features given.

Conclusions are mainly wishful thinking because not based on proven evidence in the results section of this paper.

The revised construction is declared to be sufficiently unique to erect a new family \*\*\* (what are the three stars).

There are no arguments given to support this declaration.

The last parts of the conclusions are unfounded speculations and unrealistic suggestions.