

Comprehensively and thoroughly – this manuscript adequately documents the morphology of the coronodonids and discusses its implications extensively. I enjoyed reading this big manuscript, and no doubt this manuscript should be published. In such a big manuscript with much discussion, I do have some comments/suggestions for the authors to consider.

1, Coronodonidae

With two more new species of *Coronodon* described (*Coronodon newtoni* and *Coronodon planifrons*), it seems reasonable to establish a new family as the authors suggest – Coronodonidae. Then, according to the phylogenetic trees the authors recover, the question is the inclusion of Coronodonidae. For example, the authors suggest ChM PV 5720 belongs to a possible new genus of Coronodonidae, and its phylogenetic position is the sister lineage of other *Coronodon*. If so, should we also consider including two other taxa – *Borealodon osedax* and *Metasqualodon symmetricus* – in this new family, as both EW and IW trees recover the same topology?

Where to place the node of Coronodonidae may still be in its infancy, as both *Borealodon osedax* and *Metasqualodon symmetricus* remain poorly known, and the phylogenetic relationships of toothed mysticetes stay changing over the past years. Still, this would be critical to consider the evolutionary history of Coronodonidae. For example, biogeographically speaking, given the known coronodonids of this manuscript, the coronodonid distribution is limited to South Carolina, i.e., the western coast of the North Atlantic. But, if *Borealodon osedax* and *Metasqualodon symmetricus* (or just one of them) turn out to be coronodonids, the distribution of coronodonids would at least include North Atlantic and Pacific oceans, i.e., across the northern hemisphere.

2, Neoceti

One of the key discussion points in this manuscript is the phylogenetic position of Coronodonidae in the cetacean evolution – whether Coronodonidae should be nested within Neoceti (the most recent common ancestor of extant odontocetes and mysticetes and all the descendants) or in a less inclusive clade, Mysticeti. A recent study also suggested some

species that have long been considered “toothed mysticetes (including coronodonids)” fell outside Neoceti (Corrie & Fordyce 2022; the authors of the present manuscript also discussed this publication quite a bit in the text).

In addition to more taxon and character sampling, as the authors also consider at the end of the manuscript, this issue may be more contingent on the early radiation of a clade – in this case, it can be related to the explosive radiations of Neoceti or Mysticeti. For example, a recent publication on mammal evolution in *Science* (Goswami et al. 2022, 378:377-383) also came to a conclusion that the uncertainty results from the lack of explicit morphological differences at the earliest diverging representatives. It seems to me this may reasonably be applied to resolving the early radiation of Neoceti or Mysticeti. Still, we should find more fossils and employ various approaches to tackle such critical evolutionary problems.

3, Relationships

Coronodonid materials represent unparalleled in toothed mysticetes, and it should give the potential to discuss the relationships a bit further (for future projects, not necessarily in this manuscript). For example, the geological succession and ontogenetic sequence of coronodonid materials seem to permit further considerations or analyses to build a rare but informative evolutionary trend in vertebrate paleontology – such as the famous *Triceratops*, likely representing an anagenetic example from the Hell Creek Formation of Montana (Scannella et al. 2014 PNAS 111:10245-10250). In addition, given the relatively abundant materials of coronodonids, it may be possible to build an “ontogenetic clade” in the phylogenetic framework by having some well-preserved juvenile specimens as separate OTUs (Tsai & Fordyce 2015 Biol. Lett. 11:20140875) for deciphering the possible ancestor-descendant lineages instead of common sister-group relationships.

4, other minor comments

Order – right after the Systematic Paleontology section, it seems better to start describing *Coronodon havensteini*, as this is the best-known species, instead of a specimen belonging to Coronodonidae indeterminate (CCNHM 8745).

Referred specimen – the authors did not include CCNHM 8745 in the phylogenetic analysis due to incomplete preservation. Various species of published toothed mysticetes also rely on similar not-ideal fossil materials – also, given the detailed description of CCNHM 8745 in this manuscript, it seems quite reasonable to show where this specimen goes with other coronodonids (not absolutely necessary in this manuscript though – this can also be done as a separate project), as the authors suggest it might belong to a distinct genus of Coronodontidae.

Specimen number – the authors cited personal observations (pers. obs.) in the text. It seems more informative to give the specimen numbers rather than only the species names (e.g., lines 382-383) so that readers or other researchers can follow.

Figure number – it seems easier for readers to follow the morphological description in some more places throughout the text with figure number – to guide the readers on where to check or confirm the morphology, as this manuscript includes 40 figures.

Etymology – this manuscript includes two new species. One of the new names is quite straightforward – to name after the collectors Claude and Albert Newton. Still, it seems more appropriate to have a separate etymology section before the description text of new species.

Orientation – some technical terms, such as orientation, seem to be pointing to the opposite side. For example, the authors use “distal” to refer to the posterior denticles of a tooth or the relative position of the dentition (e.g., lines 2266 or 2286), but the term distal in anatomy, as I understand, should indicate the part away from the center of the body – i.e., the distal denticle should be anterior one, instead of the posterior. Please confirm such technical terms – otherwise, it may cause some confusion for future comparisons.

Evidence – the authors of this manuscript revise some of the previous judgments but use a phrase like “the second author of that study now believes...” (line 2690). It seems a bit inappropriate and better to rephrase, as we should refer to solid evidence in the scientific literature instead of some unjustified phrasing.

Citation – as this manuscript is massive, it seems easy to miss some citations. For example, the paper of Long et al. 1997 was cited in the text but not in the reference list. I believe the authors would carefully check it before publication. Similarly, some updated, relevant

research may be cited – for example, the authors cite Schulte 1916 for the muscle insertion in extant mysticetes – a special issue of *The Anatomical Record* (Anatomical Investigations of the California Gray Whale 2015, 298:639-779) also includes some relevant papers.

Otherwise, I look forward to the formal publication of this highly informative and important manuscript.

Regards,

Tsai