MANCHESTER 1824
The University of Manchester

Robert DePalma
Dept. of Earth and Environmental Sciences
University of Manchester
Williamson Building
Oxford Road
M13 9PL UK
paleogen@aol.com

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Dear Editor,

Thank you for inviting us to review the revised version of this manuscript. I appreciated the opportunity to provide a first round of review for the first draft of this manuscript. We note that the revised version of the manuscript remains problematic in many ways. The editors recommended major revisions after the first round of review, with which I concurred based on many issues, inconsistencies, poorly supported or unsupported claims, and misdirection that I had outlined in the first review. After reading the revised draft and commentary by the authors, it is unfortunately clear that the required major revisions were not carried out.

Following the opening comments below is a review of the text in *PeerJ* format, and a closing statement. Please be aware I have consulted my PhD supervisors at the University of Manchester, Professors Phil Manning and Roy Wogelius, as well as my colleague at Florida Atlantic University, Professor Anton Oleinik, in the course of preparing this review. Many critiques and viewpoints shared in the first review remain valid and are carried over here.

Sincerely,

Robert A. DePalma

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Review of *PeerJ* manuscript 98788 entitled "Calibrations without raw data- a response to "seasonal calibration of the end-Cretaceous Chicxulub impact event", authored by M. During, D. Voeten, & P. Ahlberg, that critiques the work of Nature *Scientific Reports* manuscript by DePalma et al., 2021 entitled "Seasonal calibration of the end-Cretaceous Chicxulub impact event".

In the revised draft, the authors have failed to adequately or fully address the recommendations and concerns posed by the journal and the reviewers. In many instances, a superficial effort was made to placate editor requirements and reviewer comments but those efforts fell short of the editorial requirement of “major revisions”, and were unsatisfactory to remedy the issues raised during the first review. This included an instance in which the authors changed only a single word, providing a cursory and superficial action that failed to markedly change the text or remedy the insufficiencies in their work that prompted the editorial and reviewer requests. In other instances, the authors directly contradicted the editors or declined to address or remedy the issues that were raised by the editor. Untrue or poorly supported comments were also provided by the authors. In yet other instances, the authors demonstrated further unfamiliarity with standard techniques or insights, which carried over from similar unfamiliarities that were made apparent in their first draft, including unfamiliarity with standard methods of histologically determining the season of death in fish. In total, the authors failed to improve their paper to a point that sufficiently satisfied the critiques and recommendations of the reviewers as well as editorial requests, such that this paper is not fit for publication. of This reviewer strongly recommends that, based on those reasons alone, this draft is not fit for publication.

There are, however, other concerns regarding the submitted manuscript. This draft was submitted by the authors under misleading and dishonest pretenses, in that the authors submitted it while in possession of pertinent information that would serve to invalidate the relevance and utility of their manuscript.

Specifically, the authors were aware of the following key details (and others) regarding the outcome of a year-long rigorous investigation by the University of Manchester, regarding the same research that constitutes the topic of their PeerJ draft, which determined that:

1) The data in the DePalma et al., 2021 study was genuine and not fabricated
2) Minor errata existed
3) The minor errata did not impact the conclusions of the study in any way
4) A course of action was proscribed to correct the errata and clarify any questions, via coordinated arrangements between the University of Manchester, the authors, and the journal Scientific Reports.
5) The DePalma et al., 2021 authors have been working to submit an erratum to the journal.

The authors (During, Ahlberg, and Voeten) are and have been aware of all of those facts, and that the authors of DePalma et al., 2021 are in the process of dutifully following the scientific method and the course proscribed by UoM and the journal, working in tandem to offer full clarification, correction of minor errata where necessary, and additional data that incontrovertibly demonstrates the veracity of the original work.

Despite knowing that, they (During, Ahlberg, and Voeten) still sought to submit the present manuscript. The submission therefore does not follow a pattern that seeks to collegiately correct the scientific record or address questions that they raised, since they are aware that measures are already being taken to address any minor errata and clarify any misconceptions.

Furthermore, the present draft is also a near-identical re-hash of multiple grievance documents submitted elsewhere by the same authors that all redundantly and repetitively belabor the same points time and again, while they were fully aware that the matters being discussed were either demonstrated

false or that corrections were in the process of being made to minor errata via the procedures proscribed by the UoM and Scientific Reports. The authors dishonestly conceal knowledge of those facts and proceed as if the document that they submitted holds merit, when in fact it does not serve any useful purpose.

The authors of the draft were early-on made aware, prior to making their first 2022 public complaint about aspects of the DePalma et al., 2021 study, that the DePalma et al., 2021 team would address any legitimate minor errata, that the scientific method would be followed to responsibly and properly carry out those efforts, and that they (During, Ahlberg, and Voeten) were even invited by DePalma et al., 2021 to join together in that corrective effort. Instead, the authors (During, Ahlberg, and Voeten) declined to follow the constructive, scientific, and collegiate path and elected instead to choose an unconstructive path of public denouncement that misleadingly withheld their full knowledge of the situation, and while knowing that doing so would, without question, serve to delay and hamper the already-begun effort of DePalma et al. to properly and scientifically correct any minor errata in the proper fashion. Their choice to repeat it in public forum, time and again, each time hampering that process, therefore does not follow a pattern of seeking out a correction of the scientific record, but knowingly serves to slow it, demonstrating that their reasons for doing so must be something other than altruism for the sake of science. This draft is the latest iteration in that pattern.

Below please find additional comments regarding the revised manuscript, which are much in-line with the first review, as very little has been improved.

1) The issues raised in this manuscript are a repetition of allegations raised in a complaint filed by During and Ahlberg at the University of Manchester on December 9, 2022. An exhaustive investigation was carried out by the University of Manchester which included an external specialist and an appeal process. The University of Manchester, after considering extensive documentation and live witness testimony, produced a comprehensive report dealing with those allegations. The pertinent results contained in that report were published online on December 15, 2023, please see: https://www.manchester.ac.uk/discover/news/palaeontologist-cleared-of-fabricating-data-in-dino-killing-asteroid-paper/

The minor errata made in graph preparation and reasons for the truncated methods section are all clearly explained in that document and therefore this submission to *PeerJ* provides nothing of scientific value to the reader beyond what is explained in that report which has now been available online for 9 months.

For reasons of transparency, we are obligated to list all of the allegations that were presented by During & Ahlberg, which comprised the UoM investigation:

-Scooping and unethical sabotage

During and Ahlberg accused Robert DePalma of "deliberately publishing a rival paper on the same topic and identical conclusions" as an "unethical sabotage attempt" against Melanie During.

-Data fabrication and manipulation

During and Ahlberg accused Robert DePalma of data fabrication and manipulation in order to carry out the "scoop and unethical sabotage" of the first allegation.

-Corrupt interaction with handling editor

During and Ahlberg accused Robert DePalma of corrupt interaction with the journal in an effort to carry out the action of the first allegation

-Smear campaign

During and Ahlberg accused Robert DePalma of initiating a social media smear campaign against them

After the official UoM inquiry that was exceptionally rigorous and lasted nearly one year, plus a subsequent appeal initiated by the complainants and a thorough treatment of every single allegation, all four of the allegations were found to be without merit and were overturned.

The investigation concluded that the data in question were not fabricated, the claims of "scooping via a rival paper", corrupt interactions with the journal, and social smear campaign were all unsupported by the evidence.

The investigative panel determined that, even in light of this exoneration, "*the overall conclusions of the paper still stand should the stable isotope results be removed*"

It was determined by the investigation that During also knowingly provided untrue statements to the panel, including but not limited to (1) claiming that she was not aware that DePalma was working on the study, and (2) claiming that he had not invited her to be a part of it.

After all of the points listed against the defendants were addressed and/or overturned, the UoM Ethics Board clearly informed During and Ahlberg that, given that they were aware that their claims were overturned by the outcome ruling of the investigation, they were to refrain from pressing them further as that would constitute dishonest and malicious willful dissemination of untrue statements.

2) Because this matter has already been thoroughly investigated and adjudicated via a formal research ethics inquiry, we need to alert the editors of *PeerJ* to the fact that this manuscript submitted by During, Voeten, and Ahlberg, which repeats these allegations, is defamatory and potentially libelous. In light of the severity and nature of the allegations that were leveled at the corresponding authors of DePalma et al., 2021 by During and Ahlberg in their complaint to UoM, and the fact that all of those allegations were overturned and found without merit, the additional attempts by During and Ahlberg to repeatedly circulate the same critique, including the draft submitted to *PeerJ*, are unethical, fail to honor the official process that had been undertaken, and do not follow a pattern of impartial and altruistic academic pursuit. They instead appear to constitute an abuse of the scholarly journal system for reasons other than scientific merit.

3) We also want the editors of *PeerJ* to be aware that this manuscript has been redundantly submitted to various journals by During and Ahlberg over the past two years and has already been published at least twice, see for example:

PubPeer (https://www.pubpeer.com/publications/9B9D041BD4D3633C2D4F99D002DF87),

PCI Paleo (DOI:10.24072/pci.paleo.100221**)**

These two versions of this manuscript are essentially the same as what has been submitted to *PeerJ*, in fact the *PCI Paleo* manuscript is verbatim the same and was published online on the 26th of March, 2024, only ten days before the date of April 5th, 2024 assigned to the *PeerJ* submission.

Therefore the authors are attempting to re-publish the same material which has already been published and has an active DOI assigned. This does not meet the criterion for valid new research that would be suitable for publication. It is a repetition and a re-hash.

4) The manuscript was also previously submitted to *Scientific Reports* which rejected it on the grounds that it provided no scientific value, particularly in light of the fact that the topics discussed therein are already in the process of being either properly clarified or minor errata being corrected. The precedent set by the rejection, and its basis, should have bearing on the assessment of the suitability for publication of the same content that has now been submitted to *PeerJ*.

5) Lack of disclosure was also problematic. It is clear that the authors concealed from *PeerJ* the true extent to which their manuscript had previously been submitted, breaching a policy of transparency that is typically standard and required by journals. Under the Declarations heading of the *PeerJ* submission, which asks "Are any elements of this paper or text under consideration at any other journal, or have they been published elsewhere already?", During, Voeten, & Ahlberg concealed that they had previously submitted the same material to Nature *Scientific Reports*, as well as its submission in other online formats, including *PubPeer*. During, Voeten, & Ahlberg concealed multiple occasions on which they distributed the same material, falsely implying that the content had not already been exhaustively belabored, and implying a greater novelty and applicability for the new submission. This misrepresentation to the journal, seemingly to make the manuscript appear more favorable for publication, is problematic.

6) In our experience, a critique would normally appear in the same scholarly journal as the paper that it critiques. The present attempt by During, Voeten, & Ahlberg to side-step that procedure and publish in a different journal is irregular, departs from standard practice, and should be regarded with concern.

7) In the *PeerJ* manuscript draft, there is mention of the During et al., 2022 manuscript and its relation to the DePalma et al., 2021 paper being critiqued. However, almost none of the coauthors of During et al., 2022, except for During and Ahlberg, have joined the *PeerJ* critique draft or any of the aforementioned near-identical iterations that were circulated as complaints. Abandonment by nearly all other coauthors in those efforts strongly suggests their lack of confidence in the content being presented and the course of action. This should also be taken into consideration.

For the seven above reasons, we stand by our first recommendation that the submitted manuscript is not a fit candidate for publication. However, that assessment is supported by multiple additional key facts related to the content of the manuscript. Below, following the format for *PeerJ* review, we address specific examples of concerns with the During, Voeten, & Ahlberg manuscript revised draft, and address their inappropriate use or otherwise unsuitability for publication.

[**Basic Reporting**]

Basic reporting was clear but misleading, as it circumvented known facts to arrive at unsupported conclusions. The authors lacked sufficient background in areas such as field work specifically related to this project and recognition of seasonal growth patterns in fish bone to adequately support their conclusions. The article was a belabored repeat of previous submissions that occurred after the issues raised in the draft were already adjudicated, and therefore does not constitute an example of professional scholarly work.

[**Experimental Design**]

This manuscript did not involve scientific experimentation. The questions raised were not relevant and were instead misleading as they were not reflective of the full facts that were known by the authors. Because of that, and because the draft has already been published multiple times elsewhere, it does not fall within the aims and scope of the journal. The aforementioned belaboring of topics that have already been addressed, their redundant prior circulation in public domain, and failure of the authors to disclose those facts do not follow a pattern of altruistic impartial scientific pursuit and therefore do not follow a high ethical standard. The manuscript is a highly biased and uninformed attempt to re-review a publication. The issues raised have been dealt with exhaustively elsewhere, and therefore it cannot truly be regarded as primary scientific research.

[**Validity of the Findings**]

Problematically, the information presented by During, Voeten, and Ahlberg here is redundant, misleading, and repeats what has already been belabored. All sections exhibit insufficient support of the conclusions or deal with topics that have already been addressed. This has not been sufficiently remedied since the first review, and the resubmitted draft has failed to address issues or inadequacies raised by the first review and Editor. Comments below are organized by their respective sections.

[Stable isotope records with conflicting migratory signals]

Section summary comments

This section makes broad claims about the viability of interpreted migration signals in fossil organisms without acknowledging that insufficient background data is available on migration or feeding habits of the animals in question, or acknowledging that isotopic signals that may indicate migration, if reliable and reflective of said migration patterns, are not central to any key argument or core interpretation of the paper. This section fails to adequately support the authors' criticism against the use of isotopic data to resolve seasonal cyclicity in the acipenseriform bones. Annual cyclicity is expected to be recorded in the bones of animals that experience annual fluctuations in any condition that affects bone growth, whatever those variables happen to be. For purposes of tracking annual cyclicity, identifying which variable affected the bone growth is of minimal importance compared to the fact that an annual pattern exists. During, Voeten, & Ahlberg point to questions related to oxygen isotope shifts that were tentatively interpreted to indicate migration patterns in the sturgeon, despite those interpretations having no bearing on the conclusions of the DePalma et al., 2021 study. Because not all sturgeon taxa exhibit migratory behavior, one would expect that a migration signal, if reliable and not an anomalous isotopic signature or artifact linked to other factors, would be inconsistently present for sturgeon among the population, thereby providing limited to no utility in supporting the conclusions of DePalma et al., 2021. For that reason, the interpretation of migration was never a key point in the study and was not relied upon for the conclusions. During, Voeten, & Ahlberg base part of their critique on patterns in carbon isotopes between the paddlefish and sturgeon in context of their dietary practices, which is problematic because there exists no detailed body of knowledge on extinct Mesozoic acipenseriform fish diets or feeding practices. Indeed, the specific environmental and metabolic factors that influence the annual fluctuations of bone growth even of extant acipenseriforms are very poorly understood ("…it is not easy to explore the effects of environmental and metabolic variations recorded in the spines because the processes governing bio-mineralization and growth of these pieces are still poorly known"; Meunier 2002; Bakhshalizadeh wt al., 2017). Because the authors lacked sufficient background knowledge on the feeding practices of the extinct fish, they attempted to rely on feeding data from some modern fish communities instead, without the ability to demonstrate that they can be applied to the fossil taxa. For example, many factors have never been demonstrated for fossil Mesozoic paddlefish or sturgeon, including whether they fed in the topwaters or bottomwaters, consumed live food or passively consumed detritus, possessed similar feeding practices, or feeding practices that differed markedly, etc. During, Voeten, & Ahlberg fail to adequately uphold their criticism that the isotope data from DePalma et al., 2021 does not support the conclusions that the fish perished in the Spring-Summer paleo equivalent. In addition, we furthermore point out that the conclusions of the DePalma et al., 2021 study are additionally in no way dependent on the isotopic data and the conclusions are fully supported even in its absence. (*UoM investigation finding: "the overall conclusions of the paper still stand should the stable isotope results be removed"*). The incorrect statements made by During, Voeten, & Ahlberg in this section, which fail to support their conclusions, demonstrate insufficient background/experience in this field of work by the authors.

[Primary Data]

Section summary comments

During, Voeten, & Ahlberg state that no isotope data is provided in the DePalma et al., 2021 paper, however they misrepresent themselves by their omission of certain keys facts. For example, as with

many other studies, the data was available upon request and was, in fact, immediately supplied to the journal when requested. It was also supplied to the UoM during their rigorous investigation of the allegations made by During, Voeten, & Ahlberg. Not only did During, Voeten, & Ahlberg know about that, but they, too, received a copy of the data. The concealment of those three facts from *PeerJ* during submission is problematic and demonstrates a biased presentation of incomplete facts to support or imply an improper conclusion. While the data was always available upon request, the journal may have overlooked their opportunity to add a written mention of that fact to the paper during final edits, but it was never withheld. To that end, even the title of During's submitted manuscript is overtly misleading and incorrect, as instead of "Calibrations without raw data" (which she and the journal know is untrue) it is closer to "Calibrations without a concise data availability statement". (UoM investigation conclusion: "*'the low-resolution blurry photos of paper printouts' provided by the Respondents to Scientific Reports and the Panel of Investigation…were consistent with what would be expected as a summary of calibrated data reported back to a client from a service isotope lab*"). These data sheets nonetheless constituted scientific data by any definition. (Additional UoM conclusion: "*there was independent evidence from 5 individuals (Oleinik, Burnham, Cichocki, Larson, Erikson) that DePalma's isotope data pre-dated During's visit to Tanis in 2017 and that one (Oleinik) had seen the plots in 2016 or early 2017 and confirmed they were the same ones that appear in the Scientific Reports paper*".

[Analytical Facility]

Section summary comments

During, Voeten, & Ahlberg state that some details related to the contributions by our late colleague are unclear due to his untimely decease. While regrettable, this, too, was previously surmounted in the UoM investigation, which was known by During, Voeten, & Ahlberg but not disclosed by them. Our late colleague facilitated the completion of various specialized tasks that were closer to his area of expertise than anyone else on the paper at that time. (UoM investigation conclusion: "*although McKinney's institution did not have the kind of apparatus supposedly used for the analysis, this was not evidence that McKinney had not sent the samples elsewhere for analysis*", in addition to the assessment that "*'the low-resolution blurry photos of paper printouts' provided by the Respondents to Scientific Reports and the Panel of Investigation…were consistent with what would be expected as a summary of calibrated data reported back to a client from a service isotope lab*".

[Methods]

Section summary comments

As mentioned regarding the analytical facility, the death of our colleague Curtis Mckinney occurred slightly before full completion of his contribution, which would have included his write-up of the isotopic methods. Using the notes and discussions that we had during the process, the methods were reconstructed as fully as possible, but some portions remained unknown. Our attempt was to compile methods that were as complete as those notes and discussions would allow, while not including any known falsehoods. This, too, was raised and surmounted in the UoM investigation, the process and outcomes of which are known to During, Voeten, & Ahlberg and which they failed to disclose.

[Sampling Density and Amount of Carbon]

Section summary comments

During, Voeten, & Ahlberg here fail to support their proposed conclusion that the sampling density is incompatible with the ability to retrieve sufficient sample for analysis. What they concealed from this section is that they are aware of multiple additional isotopic experts who were consulted and determined that it would in fact be possible to functionally retrieve sufficient sample. The description of drill bit shapes and sizes demonstrates an unfamiliarity with the process and technique, as a progressive inward-directed sampling along a peripheral transect is limited only by the incremental step-size capabilities of the micromill, and not the diameter of the burr. It is therefore completely unclear how exactly the number of samples per length of the sampling transect can "correspond", as claimed by During et al. to the drill diameter. No such correlation exists. This, too, was raised and surmounted in the UoM investigation, the process and outcomes of which are known to During, Voeten, & Ahlberg and which they failed to disclose. The UoM investigation conclusion (which During, Voeten, & Ahlberg are aware of) further contradicted the claims by those authors in the present draft, establishing that "*typically mass spectrometers require 25ug of carbonate for reliable analysis (approximately 500ug of fresh bone is required to reliably yield >20ug carbonate). However, it is just within the bounds of possibility for a skilled operator to recover the number of samples, and for a well-run isotope lab to recover the data*".

[Graphs in the Paper and Supplementary Materials]

Section summary comments

During, Voeten, & Ahlberg point to a variety of errata exhibited by the graphed isotopic data, however, more troublingly, they made no mention that every point raised in this section was laboriously addressed, discussed, explained, and adjudicated in the UoM investigation, all the details of which are known by During, Voeten, & Ahlberg. Their conscious and willful concealment misrepresents the facts of the issue and creates an intentional bias that otherwise could have been avoided. While the topics in this section have already been fully and thoroughly dealt with, it is worthwhile to point out some facts in response. For example, there do indeed exist a number of errata that ultimately result primarily from the untimely death of our colleague and the effort to organize his work, including the manual transcription of figures from his data sheets. The errata are largely applicable to graphs, graphed points, etc., that were manually transcribed from his printed data sheets as carefully as possible. (UoM investigation conclusion: "*The inconsistencies in the data were explained as genuine errors resulting from the lack of raw data as a consequence of the death of McKinney and DePalma's use of the interim data sheet to hand-draw the graphs*". Other criticisms noted in this section deal with factors that the authors (During, Voeten, & Ahlberg) evidently did not understand or fully read in DePalma et al., 2021 or the UoM investigation report. For example, as explained previously in the UoM investigation and known already to During, Voeten & Ahlberg, none of the graphs are identical. Because the specimens came from multiple animals with near identical life histories from a synchronous death assemblage, and in

some instances multiple sets from the same individual, similarities in patterns are not only perfectly normal, but they are expected. Because the growth lines in fish bones are wavy and sinuous, they exhibit compressed or expanded representations of the same growth band pattern, for example in troughs as opposed to lobes. So, in one individual, a single sliced surface can contain a 5-band pattern of growth that is perhaps 3 mm thick in one expanded region or 0.3 mm thick in an adjacent compressed region, with every variation in between. Another example that During, Voeten, & Ahlberg cite is the use of data point icons in the supplemental materials that they misinterpreted as error bars because they did not read the actual figure caption that explicitly states so. Another example is the mention of one specimen number that is listed twice, which was previously clearly explained, and demonstrated during the UoM investigation as being correct, because it reflected multiple sampling of the same specimen, however During, Voeten, & Ahlberg concealed that fact, implying a discrepancy that pointed toward lack of integrity. (UoM investigation comment: "*The Appeal Panel requested clarification from DePalma who explained that Fig 2 was a repeat analysis of the same sample, and provided the data from which it was plotted*". At the time of their submission to *PeerJ*, During, Voeten, & Ahlberg knew this, and every single other detail in their section about the graphs, which they could have transparently revealed to the journal but instead they only mentioned their initial criticism and omitted everything that transpired since then in the process of addressing and/or satisfying it. As we had previously mentioned during the UoM investigation, of which During, Voeten, & Ahlberg are aware, the legitimate errata in the graphs that are linked to the manual transcription of the data resulted in near imperceptible shifts that were not sufficient to affect the conclusions of the study in any way whatsoever. (UoM investigation conclusion: "*the differences between curves derived from the numerical values in the tables and the curves published in the Scientific Reports paper were minor, as confirmed by two independent individuals (Oleinik and Smit – During's MSc advisor) and were likely the result of the published curves being copied from original plots*". The UoM investigation upheld the assessment that data fabrication/manipulation had not occurred, even after an appeal process initiated by During & Ahlberg, and went on to comment that "*the overall conclusions of the paper still stand should the stable isotope results be removed*".

[Thin sections in the Supplementary Materials]

Section summary comments

In this section, During, Voeten, & Ahlberg claim that DePalma et al. manipulated an image in the supplementary section, flipping an image that had been photographed twice from the same side. Not only is this statement false and insufficiently supported, but the UoM investigation thoroughly looked into it with multiple experts, concluding that manipulation had not taken place, that the images were not both of the same face of the slide, and that the claim was unfounded. Furthermore, During was cautioned by the UoM Chair of Ethics, that, in light of During, Voeten, & Ahlberg being aware that their claim was false, if they were to perpetuate that claim they would be knowingly and intentionally circulating false and misrepresented facts in a malicious way.

[Fish sizes]

Section summary comments

During, Voeten, & Ahlberg claim that During observed no juvenile or sub-yearling fish while she was on-site, implying that none were there. This statement, at best, indicates that they did not observe or recall the sub-yearling acipenseriform fish skull included in Figure 1 of DePalma et al., 2021 as a Micro-XRF map. At worst, the statement reflects a willing concealment of their knowledge of sub-yearling fish fossils at the site, including the personal experience of During. In addition, if During did not observe any sub-yearling fish during her brief site visit, that does not indicate that the fish were not present, but rather is reflective of During's inexperience working or identifying fossils in that field setting. During lacks experience with field work in the Hell Creek Formation (we were told that her ~10-day site visit in 2017 was her first experience in the Hell Creek Formation and she had accrued fewer than two week's additional field time there in the 7 years since then, as far as we are aware). As a result, it was a challenge for During to detect most fossil material and it had to be shown to her on many occasions. She even personally encountered sub-yearling fish herself, although not intentionally- the well-preserved fins and partial body of what would have been a ~14 cm juvenile acipenseriform fish were discovered freshly broken in her debris pile, unintentionally destroyed by During as the fossil went unnoticed while she dug into the outcrop [**FIG 1**]. While During may not have measured any fish lengths during her short visit, other researchers on-site did. During, Voeten, & Ahlberg claim that the smallest fish at the site are all 15 cm long, and in support of that they erroneously cited a graph from another publication that intentionally began its tally at the 15 cm size range because the densely tangled mass-death assemblage made it problematic to accurately tally fish smaller than that in situ prior to preparation of the blocks. Regarding growth estimates, the comparison with the seasonal growth ranges of modern fish involved clearly citing multiple compiled ichthyological works, contrary to claims by During, Voeten, & Ahlberg.

[Conclusion of a Spring Death]

Section summary comments

In this section, During, Voeten, & Ahlberg state that they did not clearly observe osteocytes in the fish bone images, and therefore conclude that discerning the season of death would be challenging or impossible. This claim is perplexing, clearly demonstrates their unfamiliarity with the subject material, and demonstrates their inability to sufficiently support their claim. The assessment of seasonal oscillation in the bones of fish (including acipenseriforms) is routinely, reliably, and most-frequently carried out via counting the annuli, or growth bands, in the bone cross-sections (Kolhorst et al., 1980; Brennan & Cailliet, 1989; Jackson et al., 2007; Bakhshalizadeh et al., 2011; Neely & Lynott, 2016; **FIG 2A**). Each year is represented by a couplet comprised of a light and dark band, with the denser, dark bands grown during the favorable growth period (Spring-Summer) and the lighter, more-translucent, less-dense bands grown during the unfavorable growth period (Fall-Winter). In their response, During, Voeten, & Ahlberg yet again attempt to shift focus to osteocyte density when that method is by far not standard and is peripheral to the more widely used method of examining the dual bands of the annuli. During's comment that osteocyte density is more commonly used than examination of growth bands is incorrect. To suggest that the seasonal assessment should be based on osteocyte distribution is peculiar, uncustomary, not requisite, and not aligned with standard practice. Our assessment, based on the very clear patterns exhibited by strongly defined growth band couplets that are on par with modern counterparts [**FIG 2**] is robust, unambiguous, and was favorably critiqued by multiple professional bone

histologists prior to publication of DePalma et al., 2021 (and listed in the acknowledgements thereof). Based on studies of annual growth in modern acipenseriformes, the bone histological data, alone, was sufficient as the exclusive indicator of season-of-death for DePalma et al., 2021, barring all other evidence presented by that study. In addition, During, Voeten, & Ahlberg attempt to undermine the conclusions of DePalma et al., 2021 by claiming that the data indicates a Summer death rather than Spring. While we disagree with the focused exclusivity of that assessment, their comment further indicates their unfamiliarity with the DePalma et al., 2021 paper, which interpreted a Spring-Summer range for time of death, which is consistent both with the data of DePalma et al., 2021 and During's own analysis of the process.

[Conclusions]

Section summary comments

During, Voeten, & Ahlberg state that "The stable isotope graphs presented in DePalma et al.'s paper, as depicted in Figure 25 and the Supplementary Materials, exhibit patterns that deviate from what would be expected from direct analytical outputs". With that statement, During, Voeten & Ahlberg misrepresent themselves by concealing that they already knew the reasons for minor errata in the graphs, as they had already been thoroughly addressed during the UoM investigation. They also cite absence of raw data, when they already had in their hands the raw data, which was immediately provided upon request, as is customary for any scientific paper that does not contain it in the text or supplement. They claim that the evidence presented does not align with the assertion/conclusions of our study, however that statement is incorrect and fully unsupported, because the multiple, independent, mutually reinforcing lines of evidence in DePalma et al., 2021 robustly support the conclusions of a Spring-Summer time of death. During, Voeten, & Ahlberg claim that the osteohistological slides, fish growth, and isotope data fail to indicate the season of death, however those are all thoroughly discussed and explained in the DePalma et al., 2021 paper, including graphical explanations of the histological subdivisions laid down during favorable vs lean growth periods and showing that the fish died at some point during the favorable period (Spring-Summer). That assessment was also made by the UoM investigation, which found that "*the overall conclusions of the paper still stand*" even in absence of the isotopic data. system for personal reasons. As such, the manuscript of During, Voeten, & Ahlberg is not fit for publication and would not serve any useful benefit if that were to be published. Regardless, it can already be viewed via multiple other hyperlinks, removing any justification for adding yet another.

[References]

The Reference portion of the manuscript submitted to *PeerJ* by During et al, with only 31 items in it, contained an error indicative of unprofessional editing of the manuscript. References #20 (Lines 320-323) and #22 (Lines 329 – 332) are identical and simply redundant, which have now been corrected by the authors.

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Response to During's editorial comments

During: **Blue**

DePalma: **Red**

Editor comment: [Basic reporting] The main points are clearly and concisely stated (compare reviewer 1). Some more supporting references should be given to support the recognition of seasonal growth patterns (compare reviewer 2: see further point).

During response: Reviewer 2 correctly notes that dark and light bands have traditionally been used to study annual growth patterns. However, it is now more common to employ osteohistology for a more precise understanding of growth, as the binary nature of dark and light bands can be limiting.

DePalma comment to During response:This is incorrect and misleading, as the traditional and most widely used approach is to examine the peak-season/lean-season growth bands. During confirms what I stated in my previous review- that the use of osteocytes is a peripheral technique.

During response: To better explain this, we have included two additional references that specifically explain osteohistology and the expressions and significance of osteocyte patterns in endochondral bone. This approach underlies our analyses, but is notably unavailable for the depicted thin sections published in DePalma et al. (2021) due to their low image resolution.

DePalma comment to During response: This too is incorrect, as the images used in DePalma et al., 2021 are in fact as clear if not clearer than the histological sections used to age modern fish (see attached image, Figure 2). Notably, the growth bands exhibited by DePalma et al., 2021 unanimously indicate a Spring/Summer time of death, supporting the conclusions of all mutually reinforcing lines of evidence in that paper.

Editor comment: [Experimental design] Not applicable or needed as it concerns a reply to a published paper using as much publicly available data as possible (compare reviewer 1).

During response: We thank the editor and reviewer 1 for confirming this.

Editor comment: [Validity of the findings] The authors disclosed the information about previous publication and peer-review through PCI and falls with the scope of the journal as it would otherwise not be sent out for review and considered as a reply if it was not.

During response: We thank the editor for confirming this.

DePalma comment to During response: The authors withheld, however, the other instances in which they circulated near-copies of the same manuscript, thereby concealing the extent to which it has circulated and implying more novelty or utility for the PeerJ submission.

Editor comment: [Stable isotope records with conflicting migratory signals] It should be more clearly stated that that points are not central to the core interpretation of the original paper (compare reviewer 2) but if they are stated in the original paper, they can be entertained in the rebuttal. Please add more clearly that you cannot rule out some points due to insufficient background data is available on migration or feeding habits of the animals in question or cite such information if available. Clearly state you assume similar principles in extinct fish feeding if this is the case and back it up with references. Add information which of conclusions of the original paper (e.g., Spring- Summer death?) would still stand if isotopic data is discarded.

During response: We do not suggest that all our findings pertain to the core interpretation of the DePalma et al. paper and appreciate the confirmation that accessory claims in that paper are equally subject to scrutiny. We also feel that any novel claim made in a research paper should have sufficiently support from academic literature. We agree that supportive evidence is required to confirm or reject the interpretation by DePalma et al. (2021), and feel that exactly that is missing from DePalma et al. (2021) to begin with. Because the stable isotope values of Tanis fossils have only recently been produced and studied, background data is understandably limited. Modern fishes may offer some context, but do crucially not represent the exact same taxa, ecological strategies, and prey composition as the Tanis piscifauna, and suffer from contemporary migratory restrictions that will variably influence dietary habits as well.

We here simply wish to flag an unexpected correlation in the DePalma paper that, without additional context or explanation, raises strong doubts. However, since background information is understandably scarce for this specific topic, we have rewritten the last sentence of the referred paragraph to now say:

“While the observed $\delta\delta^{13}$C cyclicity in sturgeon bone remains within the plausible value range for the marine realm, its near-perfect alignment with the plot trajectories in the paddlefish records is highly unexpected. Although the exact relationship between $\delta\delta^{18}$O and $\delta\delta^{13}$C in Tanis acipenseriform fossils is only now described for the first time, rendering background information understandably limited, this surprising correlation warrants further explanation.”

DePalma comment to During response: During here makes a minimal edit to two sentences that fails to fully follow the editorial request to make it clear in the text that the detail being noted by During et al is not central to the core interpretation of the DePalma et al paper. During makes claims about “expected values” between different prehistoric fish taxa without giving any citations or

supportive evidence to back them up. When in reality, the oscillating patterns in isotopic values, whether for a reason of diet, temperature, or as-yet not ascertained, match with the seasonal oscillations and are strong indicators for the season of death. During fails to follow the editorial request to list any additional potential reasons for seasonal oscillation of the isotope values, such as diet, temperature, etc. During also fails to follow the editorial request to note that the conclusions of DePalma et al., 2021 are corroborated by other additional lines of evidence. Additionally, by attacking the utility of oscillations in isotopic data to support the season of death, During simultaneously undercuts the credibility of her own results on determining the time of year, which rely on the same oscillations of isotopic values (and lack the multiple other lines of corroborating evidence shown in DePalma et al., 2021).

Editor comment: [Primary Data] In my understanding the authors only state the original isotope data was not published with the original work. This is correct as the raw data (data points) of the original isotope study is not publicly available in published paper or currently available supplementary material. To avoid any misunderstanding, I would like you to add a qualifier (e.g., publicly available, or openly shared) to avoid any possible misunderstandings.

During response: The request has been implemented as: ”No primary isotopic data are openly shared, either with the paper itself or through a linked online repository.”

DePalma comment to During response: It would avoid a misleading slippery slope for During if she also noted that the raw data was immediately provided by the journal when asked for and was also provided to During et al upon request, thereby following the traditional guidelines of science, i.e. to provide the raw data on request to researchers. This also avoids the misconception that the raw data was concealed from the original study (which it was not), but rather a statement was not added or requested by the journal regarding the data being available on request. To that end, even the title of During’s submitted manuscript is overtly misleading and incorrect, as instead of “Calibrations without raw data” (which she and the journal know is untrue) it is closer to “Calibrations without a concise data availability statement”.

Editor comment: [Analytical Facility] Irrespective of the unfortunate nature of the lack of information on the analytical facility, it remains a fact that it is unknown and missing from the original article (compare reviewer 1). The known circumstances could be discussed more clearly but do not change these facts and one can ask the question if publication in lack of this information is appropriate. At least it hampers the full reproducibility of the original study.

During response: We agree wholeheartedly with the observation that the lack of information on the analytical facility is a significant issue, as it hampers the full reproducibility of the original study. Additionally, we would like to emphasize that such analyses are expensive, and it is highly unlikely that any facility would conduct these analyses for free or without keeping digital

records of their results. Furthermore, the coauthor listed as responsible for the analyses did not have access to the described facilities in the laboratory with which he was affiliated.

DePalma comment to During response: During continues to discuss this topic even after the editorial remark that continued discussions would not be worthwhile. During also withholds the fact that the data were found by official investigation to be sound and not fabricated despite the incomplete documentation of their genesis. Most importantly, During withholds her direct knowledge that, in line with the proscribed course of action outlined by the University of Manchester, and in agreement and coordination with UoM and the journal, the DePalma et al authors set out to reanalyze from scratch specimens from the original study to demonstrate the veracity of the data, its support of the conclusions, and simultaneously provide a complete and unquestionable record trail. By concealing that information, During thereby conceals a critically important fact that has direct bearing on the utility of her PeerJ draft.

Editor comment: [Methods] Irrespective of the unfortunate nature of the lack of detailed description of methods, it remains a fact that various details needed for reproducing them precisely are not known and missing from the article (compare reviewer 1). The known circumstances could be discussed more clearly but do not change these facts and one can ask the question if publication in lack of them is appropriate. At least it hampers the full reproducibility of the original study.

During response: We agree that the lack of detailed descriptions of methods in the original article significantly hampers the reproducibility of the study. The authors of the original work are responsible for providing all relevant information, and the scarcity of these details is a notable issue. We concur with the editor that publication without these details may not be appropriate. Addressing these gaps is the goal of our paper. It is important to note that it is not our responsibility to interpret what went wrong in the original study but to highlight the lack of essential methodological details.

DePalma comment to During response: During conflates statements by the editor here. Truncated isotopic analysis methods can hamper *one aspect of the study*, not the study in toto, the conclusions of which are supported by multiple lines of evidence and remain standing even with full removal of the isotopic data. Even so, as stated above, During is fully aware of the procedures proscribed by the UoM to clarify any misconceptions and correct any minor errata, and is also aware that DePalma are actively working to follow those requested actions using the scientific method, and in a proper fashion. During is therefore fully aware that circulating, yet again, a document such as this latest PeerJ draft, is not only superfluous, but is also counterproductive to accomplishing the very thing that she claims to be promoting- good science.

Editor comment: [Sampling Density and Amount of Carbon] I feel it should be acknowledged (ideally with supported reference(s)) that reliable analyses are within the limits for a skilled operator to recover the number of samples and well-run isotope lab to recover the data" but could also be mentioned that it is hard to reproduce when the operator or at least the lab is not known. The role of incremental step-size capabilities as opposed to burr/drill diameter on sampling should be discussed (see reviewer 2).

During response: Regarding the "limit" of sampling density in scientific studies, it is important to recognize that this is a continually evolving concept as scientific techniques progress. While there may not be definitive studies addressing these limits, the field often seeks to advance and refine sampling methodologies. An example of such advancement is the "cold-trap" technique (Vonhof et al., 2020), which was utilized in During et al., 2022 to enhance the recovery of small-sized samples and achieve higher-resolution sampling.

DePalma comment to During response: This entire paragraph of response is unnecessary, as it is already made clear that reliable analyses are within the limits for a skilled operator, which is the whole point.

During response: It should be noted that achieving reproducibility in high-resolution sampling requires detailed methodology and a well-defined laboratory setup. The role of incremental step-size capabilities versus burr/drill diameter in sampling should also be considered, as suggested by reviewer 2. However, specific options to achieve exceptionally high sampling resolutions are not widely documented, and the burden of proof should rest with those advocating for such capabilities rather than expecting authors to speculate on methods beyond current knowledge.

Since our justified doubts can indeed not equate proof for the reliability of sampling with methods that are not described, we have rewritten the end of the referred paragraph to now say:

DePalma comment to During response: This entire block of text rambles through various possible sampling strategies and outlines that various labs devise their own specialized protocols for sampling, which everybody already knows and has no bearing on the main point, which is the fact that the sampling density and amount of carbon are within acceptable parameters. The editor asked for this to be explicitly stated during revision, backed up by citations. During distracts from that critical fact by adding the response text extra text as fluff.

During's revision: Although the reported resolution may have theoretically been achievable prior to 2017, when the co-author declared responsible for the analyses passed away, it must always have involved a novel approach or modification from an existing protocol. The parameters involved require a declaration to ensure reproducibility, but such a specification is lacking here[5].

DePalma comment to During response: During fails to use citations to support the requested statement that the reported resolution of sampling is plausible, as requested by the editor.

Editor comment: [Graphs in the Paper and Supplementary Materials] I feel the full possibilities of the reasons behind discrepancies between graphs in the original work should be acknowledged and discussed particularly those raised by reviewer 2. Please make sure the points raised and how they discussed are entirely consistent with the original publication when you refer them as such. Please rephrase when implying lack of integrity when this cannot fully be substantiated. One can wonder however why isotopic analyses need to be included in the original paper if its full details are not known and not needed at all to come to a similar conclusion. As this reply is focused on isotopic data, it would be good practice to at least point out that results and rougher estimate of time of death may hold if isotopic data is removed but would be more robust when confirmed by two different approaches.

DePalma comment to During response: The editor requested that all honest possibilities for minor errata should be explicitly stated rather than implying that they are the result of a lack of integrity, as originally posed by During et al.

DePalma comment to During response: The editor requested that During point out the fact (which is also a conclusion of the UoM investigation) that the estimate for time of death can hold in the absence of the isotopic data

DePalma comment to During response: During fails to clearly or explicitly carry out either of those editorial requests and instead glosses over them or makes cursory changes of one or two words, missing the point of the requests.

During response: We respectfully disagree with reviewer 2. We have thoroughly considered all logical possibilities to explain the discrepancies observed in the graphs from the original work.

In scientific practice, it is customary to dismiss results when uncertainties in isotopic determinations are unusually large, especially when measuring both carbon and oxygen isotopes together as CO_2. DePalma et al. (2021) did not provide specific details or thresholds for such uncertainties, nor did they disclose internal standard deviations of individual measurements or isotopic standards, which are critical for interpreting isotopic data accurately. This lack of transparency raises concerns about the reliability and reproducibility of the presented isotopic records.

DePalma comment to During response: During misdirects here by yet again going back to the truncated methods, which have already been mentioned. During also withholds the fact that the raw data were already found to be genuine and not fabricated.

During response: Furthermore, the burden of proof lies with reviewer 2, who instead of explaining their sampling resolution or methodology, is asking us to consider all the options. The methods described by DePalma et al. (2021) suggest high-resolution sampling with minute sample sizes, which poses challenges for obtaining multiple measurements as typically required for carbonate samples. The absence of detailed methodological explanations further complicates understanding and replication of their findings.

DePalma comment to During response: During here ignores yet again the fact that it has already been determmined that the sampling size described by DePalma et al is plausible. The

rest of her statements are yet again centered on truncated methodology, which has already been discussed. During fails to understand why it is her duty as a scientist to explore all possibilities for a particular outcome (in this case minor errata) instead of jumping to conclusions of lack of integrity without direct evidence of such.

During response: It is essential to note that while isotopic analyses may not be fully detailed in the original paper, their inclusion is often crucial for supporting conclusions about time of death or other biological processes. However, without robust methodology and data transparency, these conclusions may lack the necessary reliability. Our critique aims to highlight these methodological shortcomings rather than imply lack of integrity, emphasizing the importance of rigorous scientific reporting for advancing knowledge in the field.

DePalma comment to During response: During places unrealistically high value on the isotopic results, when they are but one sub-portion of the multiple independent and mutually corroborating lines of evidence that support the same core conclusion of the DePalma et al study.

During response: Since we noted the request to “rephrase when implying lack of integrity when this cannot fully be substantiated.”, we have made the following edits:

Line 120: Multiple inconsistencies indicate that the graphs[5] were produced by image- handling software such as Adobe Photoshop. is rephrased to now say: Multiple inconsistencies are best explained as graphs[5] that were produced by image-handling software such as Adobe Photoshop. (we toned “indicate” down to “best explained as”)

DePalma comment to During response: This minimal and cursory rewording is still unclear to the reader, as it could equally imply total fabrication of the graphs via image handling software versus legitimate construction of graphs completed with the aid of image handling software.

During response: Line 178: Together, these characteristics strongly suggest that the graphs were manually created using image-handling software like Adobe Photoshop, rather than being direct outputs of analytical graphing software. is rephrased to now say: These collective characteristics are most consistent with graphs that were manually created using image-handling software like Adobe Photoshop, rather than being direct outputs of analytical graphing software. (we toned “suggest that the graphs were manually created” down to “most consistent with graphs that were manually created”)

DePalma comment to During response: Again, the minimal, cursory amendments here miss the point, as mentioned above, and are a bare-minimum attempt to follow the editorial request.

Line 180: Moreover, they cannot represent faithful manual reproductions of such analytical graphs, as they exhibit features that are inconsistent with copying errors. is rephrased to now say: Moreover, they cannot represent faithful reproductions of machine-generated analytical

graphs, as they exhibit features that are inconsistent with copying errors. (we toned “faithful manual reproductions” down to “faithful reproductions”)

DePalma comment to During response: This minimal edit completely bypasses the editorial request to remove unsupported insinuations of lack of integrity and to consider all potential options. During also conceals the fact that she is fully aware that all of the minor errata mentioned in this statement have already been explained as honest errata that stemmed from the handling of non-digital printed data sheets acquired from our late colleague, yet she still makes statements to the contrary. This is dishonest and misleads readers. This entire sentence should be reworded accordingly.

During response: We identified no further explicit suggestions of (perceived) “lack of integrity” in the referred paragraph. Regarding “As this reply is focused on isotopic data, it would be good practice to at least point out that results and rougher estimate of time of death may hold if isotopic data is removed but would be more robust when confirmed by two different approaches.”, we have noted this request and added: ”By binarizing a histological section into either “lighter bands” (associated with autumn and winter) and “darker bands” (associated with spring and summer), one can indeed discriminate between death in autumn/winter or spring/summer. However, quantification of osteocyte distribution is more reliable and allows for distinction between the four individual seasons[6,34].“ to lines 253-257.

DePalma comment to During response: This edit is a bare-minimum approach to follow the editorial request, however still misses the point. During fails to follow the editorial request to explicitly state that the conclusions of the paper are supported even in the total absence of the isotopic data (corroborated by the findings of the UoM investigation). During introduces an unnecessary red herring, as she already confirms our prior assertions that the histological observations support our conclusions but adds an unnecessary statement that refining growth band histology with osteocyte density could help, which has no bearing whatsoever on the original study, as the conclusions are already supported by the existing evidence.

Editor comment: [Thin sections in the Supplementary Materials] As manipulation seems hard to substantiate and alternative explanations exist, I recommend acknowledging this in the manuscript or remove this claim entirely. Something like – At first glance, image manipulation seems a possible explanation but alternative explanations such as … could explain this pattern (or cannot be ruled out entirely).

DePalma comment to During response: The editor directly requests During to acknowledge that alternative explanations other than manipulation exist

DePalma comment to During response: The editor requests that During remove her claim entirely, if she refuses to offer alternate explanations that do not accuse lack of integrity.

DePalma comment to During response: Despite the editorial request, and despite direct comments to During from the UoM office of research integrity that manipulation had not occurred and that During was directed to desist in circulating those claims, During persists in perpetuating them.

During response: We respectfully disagree that it is hard to substantiate the observation of image manipulation in the case of the identical microscopic slides presented under different specimen numbers. Even superficial examination reveals that these images depict the same section, with one being horizontally flipped 180 degrees. We perceive this as blatantly obvious and feel this is problematic specifically because multiple images of the same section (i.e. sample) were assigned different sample numbers. Without speculating on how this came to be, this section is now presented as multiple specimens that –logically– present the same signal.

During response: While alternative explanations such as unintended variations in photographic settings might account for some differences, the deliberate flipping of an image raises questions about the presentation of data integrity. The decision to assign separate specimen numbers to these images further complicates the situation, as it suggests a departure from standard scientific practices.

DePalma comment to During response: Assignment of separate specimen numbers had been carried out by multiple institutions for many decades, although usually less-so recently. There are instances in which each bone of an entire skeleton was given a different number. During's claim here is false.

During response: It is important to approach this observation with the utmost objectivity and to acknowledge the potential implications without making accusatory statements. Transparency and accuracy in scientific reporting are critical to maintaining the trust and credibility of research findings.

During response: Nevertheless, in line with your previous suggestion, we have replaced the word "manipulated" with the word "flipped" in line 220 to present the observation rather than suggest "manipulation".

DePalma comment to During response: This change of a single word does very little to address the editorial request and in fact over-interprets the circumstances surrounding the image in question without direct evidence of evidence or intention.

Editor comment: [Fish sizes] It is hard to verify these claims without fieldwork of my own but absence in such context may not necessarily be proof of absence. So, I feel you should consider if you really can raise this point (which seems to some degree a duplication of the known lack of raw data – line 216). If you want to raise it, you should more clearly highlight the potential limitations of available observations considering size and how those can be addressed in the future. This would include stating more clearly how many "published" fishes you are aware off from your own work and others is necessary to better understanding this point. Acknowledging the time, you spent in the field would be appropriate if you want to discuss this

pattern and/or at least mentioning that an absence of smaller size in your observation could also related to having more limited sampling (make sure cited references are correctly cited in this content). Possibly you can also add information how confidently ontogenetic stages (juveniles versus adults) can be identified in this lineage.

DePalma comment to During response: The editor is absolutely correct that proof of absence is not provided.

DePalma comment to During response: The editor also correctly requests that During consider removing the point about fish sizes

During response: We acknowledge the editor's concern regarding fish size and the need for supporting data. This issue underscores the ongoing lack of empirical evidence, which we highlighted due to its contradiction with fish sizes described in DePalma et al., 2019, which also has no data of fish measurements, and it therefore warrants explanation.

During response: During our first author's fieldwork in 2017, sediments were meticulously collected in buckets and subsequently sieved away from the site to uncover tektites and microfossils, ensuring proper excavation practices without creating a debris pile.

DePalma comment to During response: This statement is untrue and I venture further to point out that it is an outright lie. While in the field, there was no ongoing process by which During collected debris matrix by bucket. Only two large sediment buckets were on-site and multiple cubic meters of sediment were moved by during, making it literally impossible to have collected all of her debris sediment as she claimed. Furthermore, the small volume of sediment that she did collect totaled less than 0.5 cubic meters in volume. While in the field, During also physically excavated fewer than 4 complete fish, which is a sufficiently low sample size that she lacked the ability to reliably assess anything about size distribution at all. The remainder of fish specimens that she examined were either already exposed due to erosion or provided to her on request.

During response: It is important to clarify that claims of a damaged fish found in a "debris pile" are unfounded, as no such pile existed.

DePalma comment to During response: This is a lie. The dig area around During was surrounded by a halo of excavated debris sediment, as she had no standard protocol whereby it would continuously be placed into a receptacle.

During response: The sudden presentation of a photograph of a damaged fish during the review process, attributed to our first author, raises questions, especially given the absence of published fish size measurements and photographs of hatchling fishes in either relevant paper.

DePalma comment to During response: We understand that During might not wish to accept that juvenile fish appeared in a fragmentary state in her debris pile, but she is also missing the

point- the presence of said juvenile fish, whether from her debris pile or not, completely invalidates her claim that juvenile fish did not exist.

During response: Our references on fish sizes, namely Hilton & Grande 2022 and Hilton et al., 2023, similarly only contain (sub)adult fishes, consistently exceeding the 8-12 cm size range suggested in DePalma et al., 2021. While we acknowledge that absence of evidence does not equate to evidence of absence, our observations during fieldwork and the referenced studies do not support the presence of numerous hatchlings without photographic or measurable evidence.

DePalma comment to During response: As mentioned above, with the limited number of complete fish that During excavated during her short time at the site, and the small area in which she worked, the odds of finding many sub-yearling fish herself, even if she were capable of recognizing their delicate bones, were slim. Typically no more than one sub-yearling fish was encountered per several days to a week of thorough excavation.

Editor comment: [Conclusion of a Spring Death] Please explain in greater detail why you prefer the presence of osteocytes as opposed to the standard practice of counting lighter and darker growth bands. Additional supporting references should be cited in this context (see references suggested by reviewer 2 concerning standard practice of using growth bands in this lineage). Please make sure correct reference is made to the original study (Spring-Summer as opposed to Summer). As far as I understand your interpretations would narrow it down to a single season? If other observations (growth bands) in original paper led to similar conclusions, it makes me wonder why an isotopic analysis needed to be included at all in the original. However, both sclerochronological approaches as well as paleohistological approaches of fossil organisms are based on various assumptions. I feel the standard use, potential and limitations of both should be highlighted more clearly and back of by references.

DePalma comment to During response: The editor correctly questions the red herring of mentioning less-standard osteocyte density rather than standard well-established histological bands, as alternating that approach would not impact the conclusions of the DePalma et al study as they are were presented.

DePalma comment to During response: The editor points out that DePalma et al indicated Spring-Summer for their concluded time of year

DePalma comment to During response: The editor correctly points out that many lines of evidence in the DePalma et al paper support the Spring-Summer time of death, to the extent that they question why the isotopic data was even needed

During response: We appreciate the editor's suggestion to elaborate on our preference for osteocytes over the traditional method of counting darker and lighter growth bands.

During response: However, we respectfully disagree with the assertion that traditional sclerochronological methods adequately capture seasonal growth patterns. In our view, relying

solely on darker and lighter growth bands is outdated and limits the precision needed to infer seasonal variations effectively.

DePalma comment to During response: During presents the red herring of osteocyte density when it is neither standard nor is it an approach that is integral to the DePalma et al study. DePalma et al., 2021 establishes a Spring-Summer chronology for the time of death and using osteocytes to attempt to refine that is superfluous and not needed. Its absence does not undercut the core conclusions of DePalma et al., 2021. Furthermore, its utility in the fossil record has not been demonstrated as robust or advantageous enough to reliably incorporate.

During response: As the authors conclude a spring-summer death, this does fall within the range of the darker-lighter band approach, which we now confirm in our manuscript. We respectfully disagree, however, that this method provides a seasonal calibration, as suggested throughout the paper and in the title.

DePalma comment to During response: During goes on a tangent of semantics here, as establishing the Spring-Summer season of death is indeed seasonal calibration, and attempts to constrain it further, i.e. to a single season, is both reckless and not within a reasonable range of error in the fossil record.

During response: We have, however, added: The approach selected by DePalma et al. instead focused on sometimes used in age-at-death estimates of vertebrates[35].

DePalma comment to During response: This is misleading to readers, as the technique of examining growth bands has been by far the most established and widespread method used for many years, not just “sometimes”.

This sentence (lines 251- 253) includes a new reference and can be found just before the newly added: ”Byinarizing a histological section into either “lighter bands” (associated with autumn and winter) and “darker bands” (associated with spring and summer), one can indeed discriminate between death in autumn/winter or spring/summer. However, quantification of osteocyte distribution is more reliable and allows for distinction between the four individual seasons[6,34]. “ to lines 253-257, which had the “darker” and “lighter bands”. This represents a more basal approach that is been implemented as a reaction to an earlier request by the reviewer/editor.

DePalma comment to During response: Osteocyte distribution is not universally more reliable, and despite that fact, this is a red herring in that it is not necessary for inclusion as a method in the DePalma et al study. It is a separate technique that in some circumstances can refine the temporal chronology, but that DePalma et al clearly did not find critical to their study. There is literally no reason for presentation of that separate technique to in any way be entered as a criticism for the DePalma et al study.

Editor comment: [Conclusions] I feel that you can say that the available data and graphs are less conventional but not necessarily that they are not expected from direct analytical outputs (see comment by Reviewer 2). I suggest you rephrase this part to avoid misunderstanding. Line 249 ("Furthermore, indications of image manipulation are apparent in the supplementary material") of the conclusion could be misunderstood as defamatory and difficult to demonstrate. The authors should note (line 206) that it may also have been an unintentional error – you do not present evidence to demonstrate that these sections have been flipped. Furthermore, it could have been mislabelled, miscopied into the Supplementary File, etc. Line 254 of the conclusion "We raised additional concerns regarding the authors' failure to adequately discuss how their osteohistological slides, fish body size graphs, or stable isotope graphs support the conclusions of a spring death" needs to be reworded. Even if you consider the discussion inadequate, the most important point is whether the results support the conclusions, not whether the discussion supports the conclusions. I feel the absence of public raw isotopic data in the paper and supplementary materials can be highlighted (compare Reviewer 1) and can be discussed as a potential issue with reproducibility. It would be customary to mention that you obtained access to that data and its context if this is the case on demand. I suggest that the reply should focus on the isotopic data issues and embrace that other observations may give a range (spring-summer) but not necessarily a single season unless you can substantiate these points further with additional references and observations.

DePalma comment to During response: The editor correctly recommends to mention that the available data and graphs are less conventional but not necessarily that they are not expected from direct analytical outputs…has During adequately corrected this? No.

DePalma comment to During response: The editor also correctly directs During to avoid premature accusations of manipulation without evidence or alternate explanations…has During adequately corrected this? No

DePalma comment to During response: The editor correctly notes that During's (unfounded) criticism claims that the discussion of DePalma et al does not support the conclusions, which is secondary to the primary fact regarding the *results* supporting the conclusions (which they do). Has During made it explicitly clear that the results of DePalma et al support the conclusions, while the discussion might benefit from improvement in her opinion? Has During adequately corrected this? No

During response: We appreciate the editor's feedback and have carefully considered the suggestions for clarifying our statements. Regarding the dataset, we maintain that the results presented by DePalma et al. are unexpected from standard analytical outputs. We have refrained from speculating on the nature of the anomalies but agree with Reviewer 1's assessment: "Basically, I agree with the authors here that the DePalma et al. results are sufficiently unusual/implausible that they cannot reasonably be taken at face value until primary data are presented to actually corroborate them (and ideally more details of exactly what methods were used and how the data were collected)."

DePalma comment to During response: This side-steps requests from the Editor, which is to rephrase while explicitly including that the available data and graphs are less conventional but

not necessarily that they are not expected from direct analytical outputs. That could easily be combined with the above sentence, with a “Even so, the DePalma et al results are sufficiently unusual that…”

During response: In reference to the statement on image manipulation, we acknowledge the need for precise language. We do not intend to imply misconduct but rather highlight discrepancies apparent in the supplementary materials, which may be due to unintentional errors such as accidental flipping or submitting the wrong file or another type of miscommunication. As declared earlier, we have now replaced the word “manipulated” with “flipped” to present the observation rather than suggest “manipulation”.

DePalma comment to During response: Again, see my comments above about this extremely minimal and cursory attempt that fails to satisfy the core need of the Editorial request

During response: However, we are concerned that an explanation addressing these discrepancies was not provided by reviewer 2, and the focus has shifted towards potential defamation. The requirement for publishing sufficiently high-resolution, non-manipulated images aligns with the editorial policies of Scientific Reports, which emphasize transparency and reproducibility in scientific data presentation. It is under these principles that we feel compelled to point out the image manipulation observed in the Supplementary Information. We also believe that journals have a responsibility to address such issues before publication to uphold scientific integrity.

DePalma comment to During response: Even here, During departs from recommendations by the editor and reverts to claiming “image manipulation” during her comment string.

During response: We have taken the editor’s suggestion regarding the discussion on osteohistological slides, fish body sizes, and stable isotope graphs. We have adjusted our language to emphasize that while these elements may suggest a range of spring-summer conditions, the lack of publicly accessible primary data limits a robust validation of their conclusions.

During response: Furthermore, we maintain our concerns regarding the absence of public raw data, which is crucial for reproducibility as underscored by Reviewer 1. Transparency in scientific inquiry is fundamental to maintaining integrity and trust in the research community.

DePalma comment to During response: Has During carried out the Editor’s request to reveal that she was given access to the raw data and that the raw data was made available to qualified researchers on request, as is customary? Thus it boils down to the omission of the data availability statement, not a deceitful omission of the raw data itself, as During repeatedly attempts to imply. This should be explicitly clarified.

Editor comment: [References] Please make sure duplicate references are removed and add references where needed to support statements or interpretations (compare reviewer 2) more robustly.

During response: We thank the editor for bringing the error in our reference list to light, we have corrected this.

Editor comment: Please address these points as well as all other points raised by the reviewers including those in annotated files.

Editor comment: Given the points raised above are beyond minor revisions, I consider it a case of major revisions and that the revised manuscript will be sent back into review.

Editor comment: I look forward to receiving your revised manuscript.

>>>>>>>>>>>>>

Reviewer #2 (with the editors comments).

Reviewer 2 in brackets [ ]

Editor comments after >>>

During comments in Blue

DePalma responses in Red

The eight points raised by Reviewer 2 as reasons to reject the publication of the manuscript are in my opinion, not sufficient to warrant rejection (the reviewer's comments are in [brackets] and my reply to each point is designated by >>>):

During response: We thank the editor for his assistance in bringing forward the points of Reviewer 2 that are relevant to improving the quality of the manuscript.

[Relationship to a finished investigation]

>>> The issues raised in the reply pertain to the original publication and seem valid as demonstrated least by reviews of two external reviewers and the editor at PCI and are, in that sense, independent of allegations. The paper is written as a reply to the original published materials and not the complaint. It is true that the results of the investigation of the complaint are published but we do not have access to the original documentation, and neither is it published as peer-reviewed text with a digital object identifier. At least some of the issues raised in the reply were confirmed and even when the reason behind them is revealed, it does not change the fact that they are still perpetuated in the published and currently available work. Nowhere in the reply, is there mention of data fabrication, scooping or corruption which would be serious allegations. There is however a claim of figure manipulation (line 249-250) which is not clearly substantiated and hard to prove as it may have various alternative explanations. Neither does the reply seem to be a smear campaign as it highlights issues based on the originally published and still available materials and, particularly, associated isotope data which are irregular, as stated by external reviewers and the handling recommender of PCI and therefore they are not necessarily a reason to reject it for publication when issues related to its content below can be resolved. I cannot speak for (closed) investigations or social media which is not the content of this work, and we need to be wary of any potentially defamatory comments – unsubstantiated claims such as figure manipulation could be wrongly interpreted as such and would at best be removed or at minimum alternative explanations entertained.

During response: Our manuscript critiques specific methodological aspects of the original publication. The issues highlighted are based on scientific analysis of publicly available data and supported by external reviews. We maintain that these critiques are essential for advancing scientific rigor and should not be dismissed based on unrelated investigations. We have added an alternative explanation for the manipulated figure, and we have adjusted our tone to be even less suggestive by using “flipped” instead of “manipulated”. We do, however, not understand why Reviewer #2, likely having produced this figure, did not provide an explanation for the possibly wrongly submitted image.

DePalma comment to During response: After reading the response and corrections of During et al, it is clear that their attention to the points requested by the Editor are very superficial and barely addressed. During et al. also withhold important information and facts that they are aware of, which would serve to invalidate and remove the relevance of their PeerJ draft, particularly knowledge that the DePalma et al. authors are presently engaged in working at the request of UoM and in coordinated conjunction with UoM and the journal, to follow the proscribed responsible protocols outlined by UoM to clarify ambiguities in the original paper and correct any minor errata (all of which were already deemed to not have impacted the core conclusions of the manuscript).

[Because this matter has already been thoroughly investigated and adjudicated via a formal research ethics inquiry, we need to alert the editors of PeerJ to the fact that this manuscript submitted by During, Voeten, and Ahlberg, which repeats these allegations, is defamatory and potentially libelous]

>>> It does not seem the case to me as only issues related to the original paper and its published data are made. The discrepancies highlighted and suggestions for recommended practices concerning them are discussed. I would ask the authors of this manuscript consider

revising their manuscript such that it clearly acknowledges alternative interpretations of the issues raised, such as unintentional mistakes, database (copy/paste) errors, or graphing software misuse cannot be discounted. See also point 3.

During response: We believe we have addressed this issue in the editor's breakdown.

DePalma comment to During response: The editor clearly requested rewording and restructuring to remove insinuations/accusations and to clearly and explicitly outline the honest alternatives, which was not thoroughly carried out by During in the revision.

[We also want the editors of PeerJ to be aware that this manuscript has been redundantly submitted to various journals by During and Ahlberg over the past two years and has already been published at least twice, …]

>>>The work is available as a preprint which was reviewed and recommended by reviewers. Such work can be sent to a regular journal by choice of the authors. The journal, Academic Editor and reviewers were all aware of this and the authors also added a note about this in their submission). It is PeerJ policy that the original author be invited in case of replies; otherwise, this article could have been published like this. In addition, I feel feedback from the original author to these points would allow the inclusion of alternative interpretations / conclusions to be considered to the points raised to the fullest.

During response: We respectfully decline to address questions unrelated to the scientific critique presented in our manuscript, as they do not directly pertain to the scientific merit or findings of our study.

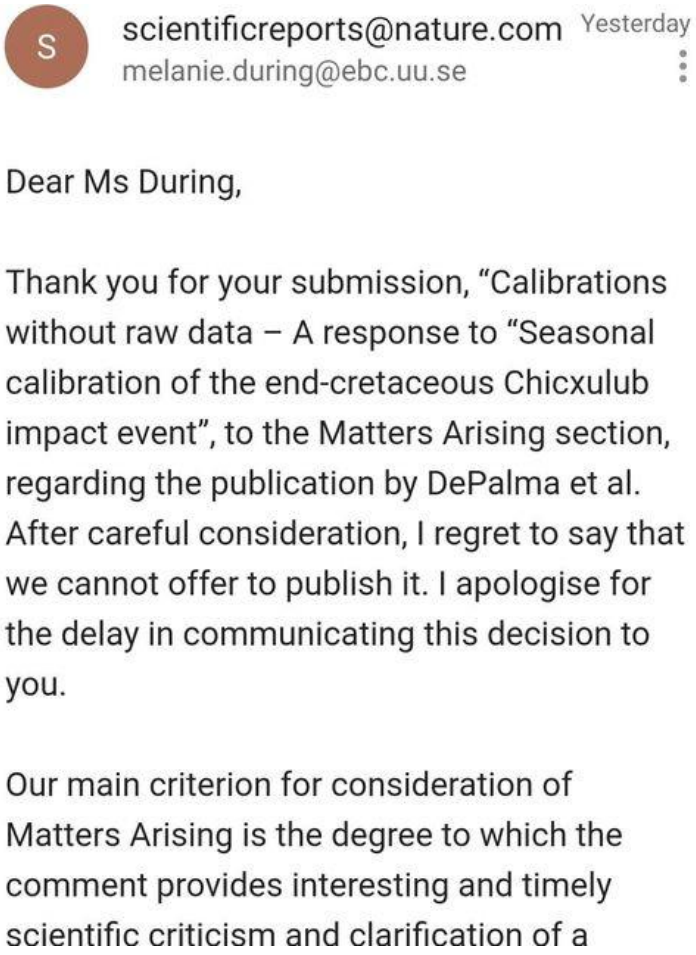
DePalma comment to During response: The questions do relate to the policy of PeerJ and policies thereof, which include full disclosure of all previous submissions of the paper. During et al were only partially forthcoming, and went against PeerJ policy on transparency by withholding multiple other instances of submission, including to PubPeer and others, which made it superficially seem more novel and relevant than it actually was. That is relevant to the current submission.

[The manuscript was also previously submitted to Scientific Reports which rejected it on the grounds that it provided no scientific value. The precedent set by the rejection, and its basis, should have bearing on the assessment of the suitability for publication of the same content that has now been submitted to PeerJ]

>>> We have no public information on why Scientific Reports rejected the reply and there could be several and so this is hard to verify from our side and not mandatory. It is also not unusual for rejection of replies/rebuttals which could have various reasons.

DePalma comment to During response: This is incorrect, as there is public information on the rejection, which During herself posted on social media. They do know why it was rejected and posted part of the rejection letter on Facebook. It is clear that the manuscript failed the main criterion of providing "interesting and timely scieintific criticism and clarification of a previous publication". See screen shot below, which reads "Dear Ms During, Thank you for your submission "Calibrations without raw data- a response to 'Seasonal calibrations of the end-

Cretaceous Chgicxulub impact event", to the Matters Arising section, regarding the publication by DePalma et al. After careful consideration, I regret to say that we cannot offer to publish it. I apologise for the delay in communicating this decision to you. Out main criterion for consideration of Matters Arrising is the degree to which the comment provides interesting and timely scientific criticism and clarification of a…".



S scientificreports@nature.com Yesterday
melanie.during@ebc.uu.se

Dear Ms During,

Thank you for your submission, "Calibrations without raw data – A response to "Seasonal calibration of the end-cretaceous Chicxulub impact event", to the Matters Arising section, regarding the publication by DePalma et al. After careful consideration, I regret to say that we cannot offer to publish it. I apologise for the delay in communicating this decision to you.

Our main criterion for consideration of Matters Arising is the degree to which the comment provides interesting and timely scientific criticism and clarification of a

>>>Irrespective, the original paper was published as it was and remains in the same way – the points raised here may therefore remain valid. I agree with the original PCI reviewer that it is unfortunate the issues raised were not picked up by reviewers, editors or mentioned by the authors, so a response paper remains valid if it can be demonstrated that they affect interpretations and revalidation of the results.

During response: We respectfully decline to address questions unrelated to the scientific critique presented in our manuscript, as they do not directly pertain to the scientific merit or

findings of our study.

DePalma comment to During response: These details do relate to the critique of During et al, and evaluation of the content of their draft. Their critique does not impact or affect the interpretations of the DePalma et al study. During et al, as well as Scientific Reports, were all collectively aware of the above mentioned points regarding DePalma et al authors following closely with the rules and recommendations laid out for them, as they worked to fulfill the tasks proscribed by the UoM. The rejection by the journal Scientific Reports would have been affected by the journal's knowledge that the points in the draft were therefore moot and already in the process of being either clarified or minor errata corrected.

[Lack of disclosure was also problematic. It is clear that the authors concealed from PeerJ the true extent to which their manuscript had previously been submitted, breaching a policy of transparency that is typically standard and required by journals. Under the Declarations heading of the PeerJ submission, which asks "Are any elements of this paper or text under consideration at any other journal, or have they been published elsewhere already?", During, Voeten, & Ahlberg concealed that they had previously submitted the same material to Nature Scientific Reports, as well as its submission in other online formats, including PubPeer. During, Voeten, & Ahlberg concealed multiple occasions on which they distributed the same material, falsely implying that the content had not already been exhaustively belabored and implying a greater novelty and applicability for the new submission. This misrepresentation to the journal, seemingly to make the manuscript appear more favorable for publication, is problematic.]

>>> I am not familiar with the previous history of this manuscript at Scientic Reports and this is also not public knowledge. At PeerJ, the authors have listed all this information, and it was sent out for review, and it is therefore not appropriate to reject it based on this reason. PeerJ and I were fully aware of its history, and it fits with our guidelines and policy.

During response: We respectfully decline to address questions unrelated to the scientific critique presented in our manuscript, as they do not directly pertain to the scientific merit or findings of our study.

DePalma comment to During response: See comments above

[In our experience, a critique would normally appear in the same scholarly journal as the paper that it critiques. The present attempt by During, Voeten, & Ahlberg to side-step that procedure and publish in a different journal is irregular, departs from standard practice, and should be regarded with concern]

>>> I agree that it would be good practice that replies are published in the original venue, but this is often not the case (I am aware of multiple instances in PeerJ and various other journals). The reasons for this may be multifold and could for example, reflect a lack of, or conflict of interest of the journal among others.

During response: We respectfully decline to address questions unrelated to the scientific critique presented in our manuscript, as they do not directly pertain to the scientific merit or findings of our study.

DePalma comment to During response: As a near-identical draft was submitted to Scientific Reports, these points to bear some significance regarding the draft submitted to PeerJ.

[In the PeerJ manuscript draft, there is mention of the During et al., 2022 manuscript and its relation to the DePalma et al., 2021 paper being critiqued. However, almost none of the coauthors of During et al., 2022, except for During and Ahlberg, have joined the PeerJ critique draft or any of the aforementioned near- identical iterations that were circulated as complaints. Abandonment by nearly all other coauthors in those efforts strongly suggests their lack of confidence in the content being presented and the course of action. This should also be taken into consideration.]

>>> This could reflect various things. It could also reflect a difference in opinion, expertise, priority, or conflict of interest. A conflict of interest could be the reason Jan Smith did not join as co-author of During et al. 2022

DePalma comment to During response: [Incorrect; Jan Smit was in fact a coauthor of During et al., 2022]

as well as co- authoring various publications with DePalma in 2019 and 2024. In other cases, it may reflect expertise and/or priority as various co-authors which did not join are experts in computed tomography and/or work in the synchrotron which is not the content of the points raised here. Without direct evidence from co-authors, this claim is hard to verify. Furthermore, there is no rule in our guidelines or principle that replies should involve all co-authors.

DePalma comment to During response: The Editor makes a very good additional point here regarding the need for participation of coauthors who are the most experienced with the techniques being critiqued. In this instance, of the coauthors of During et al., 2022, the individuals most-adept and experienced in the specialties of detailed stable isotope work using micromilling, histological observations to examine growth zones, and determining signals for seasonal fluctuations, are not During, Ahlberg, or Voeten, as they do not specialize in those areas. The actual specialists in those fields, including Jereoen van der Lubbe, Suzan JA Verdegaal-Warmerdam, and Sophie Sanchez, apparently wanted no part in participating in this PeerJ critique draft and declined to participate in any of the duplicates thereof that have been circulated on other platforms.

During response: We respectfully decline to address questions unrelated to the scientific critique presented in our manuscript, as they do not directly pertain to the scientific merit or findings of our study.

[Finally, the editor should be aware that two of the authors of this manuscript, During and Ahlberg, are currently under investigation at the University of Uppsala for alleged plagiarism of material that is closely related to this submission and additional serious breaches of professional ethics. During was the lead author on a manuscript that replicated the work that was reported by DePalma et al. 2021, that was already underway when During learned about it in 2017 (UoM investigation finding: “During was aware of DePalma’s long-standing research on seasonality and that he was working on a paper”, and “During was aware of DePalma’s work on

seasonality and the use of isotope data prior to her visit"). Submission of the current manuscript to PeerJ is therefore at best a conflict of interest.]

>>> As it is not public, this is hard to verify and so it cannot be used to influence this decision. If any of the allegations were to be substantiated, I would not support or condone them in any way. Irrespective of such investigations, allegations or investigations are not the content of the paper but rather the points raised from the original paper (if they remain valid) and suggestions on how they could be interpreted and dealt with in the future. Those points are at least considered valid by 2 external reviewers (1 re-reviewing from the pre-print) and the PCI recommender. I agree with Reviewer 1 that the rebuttal/response article furthers the conversation on the importance of data quality standards and good scientific conduct. Particularly if inconsistencies raised by Reviewer 2 can be addressed.

During response: We respectfully decline to address questions unrelated to the scientific critique presented in our manuscript, as they do not directly pertain to the scientific merit or findings of our study.

References:

Vonhof, H. B. et al. High-precision stable isotope analysis of < 5 µg $CaCO_3$ samples by continuous-flow mass spectrometry. *Rapid Commun. Mass Spectr.* 34, e8878 (2020).

>>>>>>>>>>>>

Closing remarks

Regrettably, During et al only minimally addressed the many requests made by the editor and reviewers, fell far short of the "major revision" expected of them by the Editor, and missed some of the main points of the Editor while focusing on minutia. Any slight improvements made in this new revised version are insufficient to address the prior concerns raised in review or justify its publication. We also reiterate that During, Voeten, & Ahlberg were fully aware of the answers of everything raised in the manuscript draft that they submitted to *PeerJ*, that the points have been redundantly belabored time and again over various online formats, we note that During, Voeten, & Ahlberg claim that those points have already been peer reviewed (negating the necessity of the PeerJ submission), and the contents of this manuscript have been previously addressed during a thorough, laborious, and robust year-long UoM investigation. During et al. are fully aware that all points raised in their draft are, at the request of UoM and in coordination with UoM and the journal, being clarified and/or corrections made to minor errata, however During et al withhold that knowledge as it would invalidate the relevance of their submission. As such the submission of this manuscript to *PeerJ* deviates from the pattern of altruistic scholarly duties and more closely aligns with a pattern of abuse of the journal system. Statements made by During, Voeten, & Ahlberg in their manuscript draft were presented to the journal in such a way as to be knowingly misleading because the authors had full prior knowledge that the information they presented was obsolete. They knowingly omitted any clarifications that would surely have altered the viability of their conclusions, and furthermore During, Voeten, & Ahlberg are fully aware of the official outcome of the UoM investigation, which addressed the claims that they here repeat. During, Voeten, & Ahlberg

circumvented transparency by not disclosing their prior knowledge of the UoM investigation outcome when they submitted their draft to *PeerJ* because otherwise their critique would have been undermined. Omission of those facts goes beyond an honest lack in rigor and instead is a conscious concealment of key facts that would weaken or invalidate their argument. Every criticism except for comments on the size of fish had been previously incorporated into the UoM investigation that was prompted by During & Ahlberg and they have all been adjudicated. During, Voeten, and Ahlberg present their old complaints here, as if they are fresh ideas, knowing that they and their basis are now obsolete. The data provided by the authors in support of their criticisms is incomplete and does not reflect their full knowledge of the situation's state of development. The study lacks both impact and novelty and instead is a repetition of prior-stated arguments that have already been investigated and addressed. There is no meaningful replication of any prior work or concepts and this study does not provide any meaningful advance. We recommend that this manuscript and its contents are not fit for publication.

We have followed the proper procedure thus far in cooperation with our colleagues and the UoM investigation, we were found innocent of all allegations, including the ones that comprise the body of this manuscript draft, the lead author of DePalma et al., 2021, Robert DePalma, has already complied with the UoM disciplinary recommendations related to several instances of poor research practice related to challenges in properly handling the data of our late colleague (assessments that were not part of the 4 allegations by During & Ahlberg), and we continue to follow the proper procedure by coordinating with the journal to take any necessary clarifying steps. The manuscript submitted by During, Voeten, & Ahlberg, the contents of which have already been publicly circulated multiple times in multiple ways, serves no purpose in being published, represents an obsolete moment in the timeline, and would in fact potentially confuse researchers interested in this subject area. This manuscript serves no scientific purpose: it is a continuation of an ill-conceived personal vendetta.

Figure 1. A & B, a partial well-preserved body wall and fins from a sub-yearling acipenseriform fish with fresh breaks at the matrix edges, discovered in the debris pile of Melanie During in August 2017 during her ~10-day visit to the site. The fish, before unintentional destruction during excavation, would have been approximately 13-15 cm in length based on comparative body proportions (bottom).

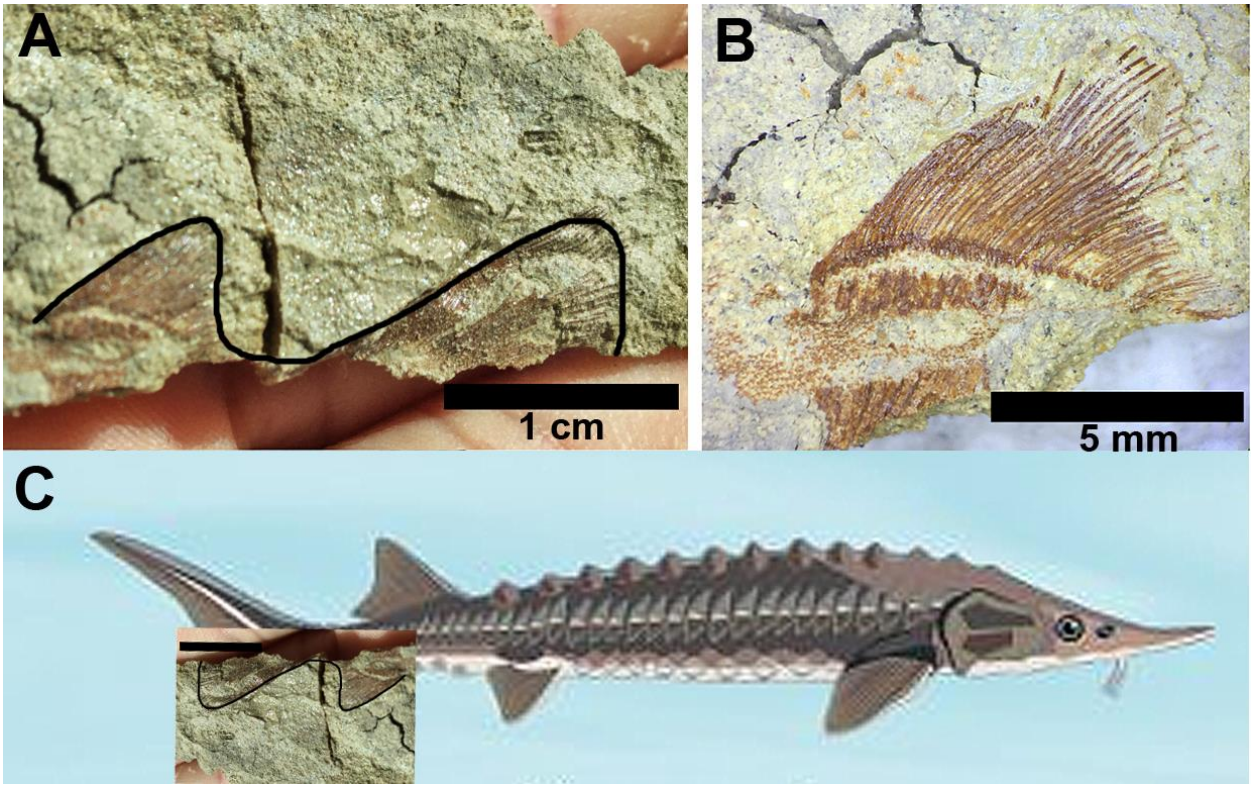
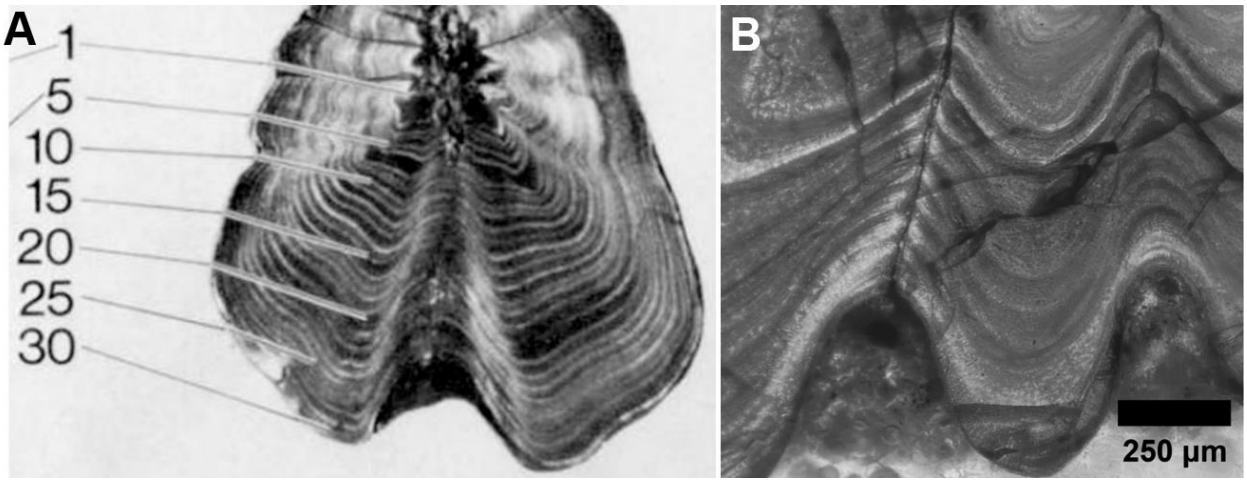


Figure 2. Standard methodology to establish multi-year chronology in modern fish relies on counting the opaque and translucent growth band couplets (annuli) as shown in the thin section of a modern fish (A). The growth bands in the fossil specimens are equally well-resolved, clear, and robust (B), enabling equivalent interpretation. A, from Brennan & Cailliet, 1989; B, from DePalma et al., 2021, sup mat figure 5. Image in (B) converted to greyscale for ease in comparison with (A).



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