

Review file for "The largest fossil tanaidacean is not a tanaidacean – *Cretitanais giganteus* (Malzahn, 1979) is a junior synonym of *Urda stemmerbergensis* (Malzahn, 1968)" by Mario Schädel, published in *Open Palaeontology*.

This file contains the editorial and reviewer comments for the 1 rounds of review for this manuscript. Confidential comments to the editor and marked up/tracked changes documents are not included.

# Round 1

Reviewer #1: Keiichi Kakui

## General

This study provided detailed morphology of the cast of holotype of *Cretitanais giganteus* and showed that it is not a member of Tanaidacea but Isopoda. I enjoyed reading this article. This is a well-prepared manuscript. I only have minor comments listed below.

## Comments

### Abstract

1. About “their head and the cheliped segment form a compound structure (carapace).”

As stated in the second paragraph of Introduction, a carapace is a shield-like structure covering a cephalothorax. I think that it may be better to change the sentence as “their head and the cheliped segment are fused and covered by a carapace.” or alike.

### Introduction

1. Page 1, left column, line 2 from the bottom: About “as the carapace is rarely reminiscent of an isopod head.”

It may be better to rephrase “as the carapace-covered cephalothorax is rarely reminiscent of an isopod head.” or alike.

2. Page 1, right column, lines 1-2: About “(trunk segments not conjoined with head/encompassed by carapace and not part of pleon)”

For me, it is slightly difficult to understand. “(trunk segments not conjoined with head, not encompassed by carapace, and not part of pleon)” may be better.

3. Page 1, right column, Paragraph 2, lines 6-7: About “(e.g. Heard et al., 2020; Pasini et al., 2022)”

It may be better to add “Wallaard, 2025” (doi: 10.1127/njgpa/2025/1229) here as the article was not included in Kakui (2024).

4. Page 2, left column, Paragraph 1, lines 5-6 from the bottom: About “belonging to Apseudomorpha Sieg, 1980 – one of the other two major tanaidacean groups”

Based on “one of the other two,” the author likely uses the three-suborder system comprising Tanaidomorpha, Apseudomorpha, and Anthracocaridomorpha. Anthracocaridomorpha is a group containing four extinct species, and some researchers do not recognize it as a valid suborder (e.g., Pazinato et al. 2023, doi: 10.3897/fr.26.99995). Given the above, Anthracocaridomorpha should be treated with caution as a “major” group within Tanaidacea, in terms of species number and taxonomic validity. It may be safer to state “belonging to Apseudomorpha Sieg, 1980 – one of two major tanaidacean groups”.

## Results

1. Page 2: About “Anthuridea Monod, 1922 (incl. Anthuroidea Lilljeborg, 1864, Gnathiidae Leach, 1814 & Urda Münster, 1840)”

I strongly recommend explaining the author's idea, reason, or source to deal with Anthuridea as a group containing Anthuroidea Leach, 1814 (note: not Lilljeborg, 1864; the author of this manuscript should check the reference [= Leach WE. 1814. Crustaceology. The Edinburgh Encyclopædia. Vol. 7. Edinburgh: William Blackwood; p. 383–437] of the name again), Gnathiidae Leach, 1814 & Urda Münster, 1840. It may be due to my limited effort in literature survey, but I have never seen this definition of Anthuridea. Monod (1922) established Anthuridea as a member of Quatuordecempedes and placed "Gnathiidea" in Decempedes. At the same time, its schémas hypothesized the sister relationships between Anthuridea and Gnathiidea (sharing the most common recent ancestor x7).

In their revision of the classification within Scuticoxifera, Brandt and Poore (2003) "demoted" Anthuridea from the suborder to the superfamily rank of the suborder Cymothoidea, treating the former as Anthuroidea Leach, 1814; also "demoted" Gnathiidea from the suborder to the family rank of the superfamily Cymothoidea in the suborder Cymothoidea, treating the former as Gnathiidae Leach, 1814.

The ICZN 4th does not regulate the order-group taxon name, with some exceptional articles. Although it appears to be commonly dealt with an "older" name of Anthuroidea, I think the author can use Anthuridea Monod, 1922 as a group name different to Anthuroidea. But, as mentioned above, to my knowledge, Anthuridea has never been used as a group containing Anthuroidea and Gnathiidea (or Gnathiidae). I did quick scan of Schädel et al. (2023, doi: 10.18268/BSGM2023v75n2a220323) and found that they discussed the close relationships between Urda and Gnathiidae but did not use Anthuridea in the manner that this article does.

Again, I think the author can use Anthuridea as a group containing Anthuroidea, Gnathiidae, and Urda, but prior to doing it, the author must explain the author's idea, reason, or source to regard the group as so. Adding Remarks section of Anthuridea or preparing the reason in Materials and methods or Discussion section may be available options.

2. Page 3, left column, Additional material section, line 6: "Malzahn and Pockrandt (1982)." may be "(Malzahn and Pockrandt, 1982)."

3. Page 3, left column, Description of NHM 1978/1997/1 section, Paragraph 1, line 3: one space is needed after "pereon". I found there are several minor mistakes in the manuscript (e.g., "In Tanaidaceans"; non-italic Urda, etc.). The author should check the manuscript again and correct such minor things.

4. Page 3, left column, Description of NHM 1978/1997/1 section, Paragraph 1, line 6: "1b,d" must be "1B,D". Figure panel labels are lowercase in the text but in uppercase on figures. The author should make them be consistent.

5. Page 3, left column, Description of NHM 1978/1997/1 section, Paragraph 2, line 3: About "Eye" The author labeled "compound eye" (ce) in the figures. To make consistent, it may be good to state "Compound eye" also in the text.

6. Page 3, left column, Description of NHM 1978/1997/1 section, Paragraph 2, line 4 from the bottom: "element" may be "article" (or "segment").

7. Page 3, left column, Description of NHM 1978/1997/1 section, Paragraph 2, lines 1-4 from the bottom: "Posterior margin of head about straight or slightly convex in dorsal view. Posterior margin

of head straight and angled towards dorsal surface of head at ca. 45° (Figure 1c).” may contain duplicated information. The author should check and correct it

8. Page 3, right column, Description of NHM 1978/1997/1 section, Paragraph 3, lines 9-16 from the bottom: About “Remain of pereopod 5 or 6 on left body side, [...] longer than preceding element, seemingly flattened.”

I could not understand which structure on Figure 1 is “Remain of pereopod 5 or 6” (is it structure labeled as “prp” (pereopod) ?). It may be better to put labels as like “Remain of pereopod (presumably pereopod 2)”, indicating which structures correspond to merus, carpus, and propodus.

For me, tracing the two pereopods on Figure 1 was difficult. It may be a good option to provide an enlarged image(s) of these structures or a colored supplementary image(s) of them.

9. Page 4, Figure 1: When I printed it out, the black near 3D images and that in background is slightly different (not different in PDF). The figure embedded in PDF may be eps format; using tiff format file may solve this issue.

10. Page 4, legend of Figure 2, line 2 from the bottom: “pr1–7, pereonites 1–3;” should be “pr1–7, pereonites 1–7;”.

#### Discussion

1. Page 4, right column, Non-affinity with Tanaidacea section, Paragraph 2, lines 5-6: About “(Figures 1c, 2b)”.

I could not understand which structure in Figure 2b correspond to “this structure”. It should be checked whether the author’s figure citing is correct.

2. Page 4, right column, Non-affinity with Tanaidacea section, Paragraph 2, lines 8-10: About “The two positively preserved elements likely represent the basis and the ischium, regardless whether a tanaidacean or an isopod affinity is assumed.”

The ischium of pereopods in Tanaidacea is short ring or crescent shaped or lacking (Kakui et al. 2012, doi: 10.1163/193724011X615406); crescent shaped condition or absence in pereopods have been reported only in Tanaidomorpha. The ischium of cheliped in Tanaidacea is usually lacking, with some groups having a short ring-shaped ischium (Kakui et al. 2012). If the author identifies the second elongate element as ischium, which supports the condition that the specimen is not a member of Tanaidacea.

3. Page 4, right column, Non-affinity with Tanaidacea section, Paragraph 2, lines 1-5 from the bottom: About “From the cast, it is not clear, [...], which is enlarged.”

I could not understand what the author wanted to say. I think “the negatively preserved large somewhat bulbous leg element” is a structure labeled as merus. I could not understand what “this” is in the phrase “this is unlikely”. I suspect the sentence may be “From the cast, it is not clear whether the negatively preserved large somewhat bulbous leg element attaches directly to the presumed ischium, regardless of the exact systematic affinity; however, the element is unlikely a part of chela (propodus) as the latter is usually enlarged.” It should be noted that propodus of tanaidacean chela is sometimes not enlarged (cf. Jóźwiak 2015, fig. 8B, doi: 10.1017/S002531541500185X).

4. Page 5, left column, Isopod affinity section, Paragraph 2, lines 8-9: About “which only occur in the tanaidacean ingroup Apseudomorpha”

As Schram et al. (1986) said “Thoracic pleurites present” in the diagnosis of the suborder Anthracocaridomorpha, it may be good to correct “which occur in the tanaidacean ingroup Apseudomorpha”.

5. Page 6, right column, legend of Figure 3, line 5: “cephalothorax Malzahn and Pockrandt (1982),” may be “cephalothorax by Malzahn and Pockrandt (1982),”

6. Page 6, right column, legend of Figure 3, line 1 from the bottom: “pr1–7, pereonites, likely 1–3.” should be “pr1–3, pereonites, likely 1–3.”

#### Author contributions

1. The sentence is likely one provided by the journal. The author should correct it following the instructions from the editor.

#### Reviewer #2: Sinéad Lynch

Dear OPAL editors and Mario Schädel,

This manuscript by Mario Schädel redescrives the only known fossil tanaidacean and reassigns it to Isopoda. The author provides very precise images, drawings, and presents a thorough analysis of the morphology. Overall, I find this to be a valuable contribution.

Please note that I am not a native English speaker or an isopod or tanaidacean specialist, but I have read the manuscript carefully to the best of my ability. Based on my background in decapod crustaceans, I find the authors’ conclusions convincing. My comments therefore focus mainly on minor issues.

Some (see attached pdf) relate to typos or minor edits (in red), and I believe the text would benefit from shorter, simpler sentences. I have made a few such suggestions throughout the manuscript (also in red), but more similar edits could be made. Comments in green indicate sections that I believe may require clarification.

My main suggestion concerns the discussion, where I found the subtitles somewhat confusing regarding whether the comparisons refer to the genus *Urda* in general, a species, or a specific specimen. I suggest that the author clarifies this in the subtitles.

In the paragraph discussing Gnathiidae (‘Affinity with Gnathiidae and *Urda*’), I am not entirely sure what conclusion should be drawn from this comparison. Perhaps a concluding sentence would help clarify this point.

I also think the text would benefit from clearer indication of which material is being discussed (e.g., more frequent repetition of specimen numbers), since multiple specimens are considered in addition to the main one.

Finally, as a suggestion, the conclusion could be slightly more expansive in summarising the study's key findings, for example by highlighting the main takeaways from the comparative discussions.

Based on the relatively minor suggestions above, I recommend minor revisions to the manuscript, after which it can be accepted for publication.

Editorial decision

Resubmitfor Review

# Response 1

Dear editors and reviewers,

I feel very privileged to have received two such detailed and helpful reviews. Most of the suggestions provided by the reviewers I complied with. In the following I only want to comment on the more substantial changes I made to the manuscript and on the few suggestions I did not comply with. The page paragraph and line numbers refer to the PDF that the reviewers revised.

## Reviewer #1: Keiichi Kakui

Suggestions of an anonymous reviewer (AR):

AR suggested to add graphical elements to Figure 1, in order to outline the shape of the leg elements. For this I added two small drawings that supplement the rendered images and hopefully help the readers to better locate and demarcate the structures on the rendered images and the 3D model.

AR pointed out that I adopted a “three-suborder” system for Tanaidacea (Tanaidomorpha, Apeudomorpha, and Anthracocaridomorpha) from the literature. I did this carelessly without questioning it. I changed this, as like AR mentioned, it is not justified. In the same comment, AR also pointed out that I forgot to include the Pazinato et al. 2023 reference, which is indeed very useful. I cited it in the introduction.

AR noticed that the use of Anthuridea is indeed a reuse of a deprecated name. While this was intentional, adding a remarks section as suggested by AR definitely adds more clarity. I also want to thank AR for the hint to the correct reference for Anthuridea. I originally copied it from WoRMS, but the base of the name is indeed older. If I may add: personally, I find these references very strange, since the original authors mostly did not use the actual term but only mentioned a genus name that subsequently became influential.

AR suggested to change the term “element” [of the antennula] to “article” or “segment”. I think my usage is not wrong and, if possible, I would like to keep my version for consistency towards my previous publications.

AR noted issues with a printed copy concerning Figure 1: “When I printed it out, the black near 3D images and that in background is slightly different (not different in PDF). The figure embedded in PDF may be eps format; using tiff format file may solve this issue.” Not having the exact printed paper of the reviewer at hand, I can not be certain, what the issue is. The figures were in PDF format before embedding them in the manuscript PDF. There is not really an alternative to that, without using bitmap images. I used PDF images to retain the text and vector qualities (e.g, searchable figure labels). It may be that AR recognized that the black in the connections between labels and the labelled structures is indeed black, while the background of the figure is dark grey. This is intentional, since dark grey label lines would have provided not enough contrast.

## Reviewer #2: Sinéad Lynch

SL's most profound suggestions revolved around the discussion section, where SL mentioned problems with the subsection headings and a lack of clarity about what the fossils are compared to. On closer inspection, it became clear to me that the real problem was the structure of the discussion as a whole. The two aspects "why it is not a tanaidacean?" and "with which group is it most closely related?" were intermingled throughout much of the discussion, whereas the subsection headings suggested that them to be separated. This is why I restructured much of the discussion. The new order in which the arguments are presented should now be more structured and the subsection headings more appropriate.

Following SL's suggestion, I also expanded the conclusion section and made more use of the accession numbers.

Page 3, right column SL: "this tergite is not in its anatomical position":

There is an empty comment for the term "anatomical". It is unclear to me, what the suggestion could have been.

For the sentence "The most interesting feature of the trunk is the short first tergite of the pereon and the second pereonite that has a concave anterior margin that fits the form of the first pereonite (Figure 1A, 2B)." SL suggested to remove the figure reference. I do not understand why and would like to keep the reference.

For the sentence "However, it is possible that some of the mouthparts are preserved in the fossil and could be revealed through skilfully applied X-ray tomography (the fossil contains a significant amount of iron (Malzahn 1979)." SL suggested to remove the word "skilfully". I changed it to "carefully" to avoid the subjectiveness of "skilfully". Removing the adverb entirely would lead to a missing connection to the information in the parentheses.

I hope my revised manuscript version satisfies the suggestion of the reviewers and reflects the effort the reviewers made to help me improve the manuscript. Please note that because the manuscript was written in Latex, I used latexdiff to create a PDF with highlighted changes.

Editorial decision

Accepted