

We would like to thank Ana Abrunhosa and Gabriele Luigi Francesco Berruti for their valuable comments which allowed to improve our manuscript. In the following, we address all comments (highlighted in red) specific to each reviewer.

Reviews

Reviewed by Ana Abrunhosa, 02 Nov 2021 22:03

- In the introduction, sometimes there are very long sentences (e.g. see 2nd paragraph page 2) think about breaking them down to increase readability. **We hope that the version is more comprehensive, even with a few long sentences.**
- The potential of functional analysis for reconstructing aspects of cultural behaviour is already established among scholars. As is my understanding of the paper, it is the potential of this study in assemblages with a higher variation of preservation conditions where the potential of analysis is being tested. The paper addresses the functional analysis through a large-scale analysis. One of its strong arguments is the comparative analysis of assemblages subjected to different post-depositional processes. I suggest this aspect be addressed and highlighted, e.g., in paragraph “in this paper, we evaluate the potential (...)” on page 3. I suggest you either rewrite it or just move the last sentence from the Discussion section (page 36) to the Introduction (“A central goal of the functional study was thus to evaluate to what extent this type of variably preserved site could still contribute to the understanding of Federmessergruppen technology and organization, with particular attention to the impact of taphonomy and excavation protocols, and an identification of domestic and hunting tasks.”) **We rewrote this part as you suggested**
- Analytical protocol can be considered part of the Methodology. Also, in protocols, it is mentioned in more detail the materials that were analysed for this study and the criteria used for their choice. I suggest this section be included in the methods (materials and methods) section. **We reorganized and rewrote this part, which is now “ 3. Materials and Methods.”**
- Page 10: the paragraph starting with “All tools were first submitted to residue analysis.” Continues with a detailed description of residue analysis observation and analysis under a microscope. This reads as the methodology of analysis therefore I suggest moving it to 3.2. – residue analysis. **We reorganized it as you suggested**
- Page 11: the last sentence of the first paragraph partly repeats what is in 3.4. I suggest deleting the paragraph from this section and moving the reference to 1000 experimental pieces from experimental projectiles to be moved to section 3.4. **We changed this part according your suggestions**
- Page 11: 2nd paragraph - Doesn't the expertise of the analyst also influence the degree of confidence of the data and interpretations? Even if all analysts are considered experts, I think this factor should also be mentioned as a factor in data analysis confidence. **We added a table (table 4)**
- Results: the impact of post-depositional factors, especially chemical and mechanical weathering can also be influenced by the nature of raw materials. Are raw materials the same on all sites? Can there be different degrees of alteration related only to external factors or are there differences in raw material as well? Would this be an element to consider in this or future studies or are the materials homogeneous and not justified? **At this state of the research the raw materials are considered to be homogeneous. Further studies need however to be performed in the near future.**

- The qualitative scale of preservation used to describe the general state of preservation in Results and Figure 3a is not very clear – what makes an artefact moderate to poorly preserved in this scale? Would like to see this more clearly explained in the text. **See the new table 4**
- Page 21: 2nd paragraph on 5.3.2. is repetitive. I suggest removing it or rewriting it. **In our view it is not repetitive, we did not change it**
- In 5.4. Hunting tasks for LB25, table 7 presents the values in integers and percentages. For LB57A table 9 presents only integer values. Why? If the data presented are used for site comparisons, I suggest you homogenise your data presentation criteria across tables. **It is because of too small samples**
- In table 9 the first column “number of pieces” presents a total number of pieces of 5 “(N=5)”. The first line “bending breaks” has a value of 6. For my understanding, if the first column refers to the number of pieces with the occurrence of fracture categories, then 5 should be the maximum number that can be on the first column for each category. If I am not correct and 6 is not a typo, please clarify the table and data organization. **We have changed it**
- “Exp 112” is referred to in Figure 16 but not in the text. I suggest you mention it in the previous paragraphs to connect the figure with the text. **We have changed it**
- Page 35 – in “The weapon design worked perfectly” what do you mean by working perfectly? I suggest rewriting the sentence to be more objective and unambiguous. I would like to see what the criteria are for you to consider that the experience went well. **We rewrote the sentence**
- The experimentation was used as the basis of comparison to understand the origin of stress marks in the assemblage. I suggest you rephrase the sentence starting with “the number of fractures obtained” to clarify that it is the experimentation that allowed validation of interpretation and not the other way around – it reads as if the archaeological is validating the experimentation. **In this case we do not agree, and we did not change the sentence**
- page 35 – results you mention a “recent ballistics investigation” – is this study published? Could you provide a reference? **The reference has been added**
- Discussion: on page 37 there is a reference to the composition of the analysis of the residues. On page 21 the reference on residue analysis provides only information from SEM-EDS (an elemental analysis, therefore, does not provide clear evidence on the organic components of the residues). On page 25 there are images of fluorescence under a microscope. If there was no chromatography or any other kind of further analysis on the organic components that means you have no strong evidence to present on its origin/type such as terpenes, carbohydrates, fats or others. In the Discussion section, some considerations are made for the source of the organic components. Without more concrete data, I suggest this paragraph should be rephrased to clarify that the origin for the residues present is a hypothesis rather than a result or conclusion of this work (so far). **We have reorganized and rewrote this part**
- Conclusion section: the sentence starting with “one of the goals” leads the reader to understand there are other goals that follow. The paragraph continues without mentioning what the further objectives are. To those who are only going to read the introduction and conclusions, this can be disorienting. I suggest you rephrase to include other goals in this section or change the start of the sentence to “the main goal”. **We changed it as you suggested**

Typos/ tables and figures edition

- citation in 3.3 (page 6) – should be “proposed in Coppe and Rots (2017)”. **Correction has been made**

- Figure 7 – I suggest making the arrows thicker as they are barely visible when printed. (This comment on arrows applies to all images). **We changed and made the arrows thicker**
- Page 38 review the use of brackets on the last citation at the end of the last paragraph. **Correction has been made**
- typo at the end of page 39 "on the basis of (based on) results FROM Lommel-Maatheide .."
Correction has been made
- Tables are not uniform and sometimes hard to read. E.g.: Table 2 is a little confusing because there are no lines/guides to read the corresponding values. The same comment applies to tables 5, 13 and 14. I suggest you edit those as you did for Table 8. **We edited them**

Reviewed by Gabriele Luigi Francesco Berruti, 21 Oct 2021 12:59

- In the introduction when the type and causes of post depositional alterations are briefly described, you may also consider conservation damage: the material analyzed also comes from collections made by non-professionals (167 curved backed points derive from the Caris collection, and 87 derive from the Janssens collection). How have the materials from these collections been preserved?
- In section two, you should add a general map with the location of the site (I suggest a map indicating the location of the site with respect to Europe, the country and the region). Furthermore, I would move Table 1 to this point by adding an indication of how the materials were collected: excavation or surface collection; in the case of an excavation which methods were used (metal sieve, trowel, etc.). **As you suggested, we added a map**
- In my opinion, should combine section 3 and section 4 to make a usual section of Materials and Methods. In this way it will be possible to merge the various subsections, for example 3.1 with 4.2. This will certainly make the text more readable. It should also indicate which programs have been used for image processing. **We have changed the structure according your suggestions (see 3. Materials and Methods)**
- In section 4.1 the criteria used to select the lithic to be analyzed should be better explained. **We added a table with more explanation**
- In figure 3, first graph, the recognition letter is displaced with respect to the other graphs. **We edited the graph**
- I suggest adding a table to indicate the various types of post-depositional alteration in relation to the sites. It would allow to notice the differences with a single glance. **We changed the figure 3, we think that with the new version is more comprehensive and it allows to notice the differences with a single glance.**
- In section 5.2: how the 506 lithic artefacts analyzed were selected? The number 506 was a mistake and for this reason very confusing. **We have changed it, and hope it is more clear now (the right number is 770)**
- In figures 7 and 8 please make arrows and other graphic elements more visible. **We edited these figures**
- In the section 5.3.3: how the 23 lithic artefacts analyzed were selected? **It should be "screened artefacts" we have edited it in the text.**

- In figure 10 a photo of the artifact under analysis could be added, as was done for figures 7, 11, 12 and 13 **Unfortunately we have not the photo of the artefact.**
- Tables 9 and 11 are unclear. Relate the fracture attributes with the individual elements examined. **We have edited the tables, and hope it is more clear now**