Peer Community In Archaeology

Open glossary for wood technologies

Ruth Blasco *based on peer reviews by* **Oriol López-Bultó**, **Eva Francesca Martellotta**, **Laura Caruso Fermé** *and* **Paloma Vidal-Matutano**

Annemieke Milks, Jens Lehmann, Utz Böhner, Dirk Leder, Tim Koddenberg, Michael Sietz, Matthias Vogel, Thomas Terberger (2022) Wood technology: a Glossary and Code for analysis of archaeological wood from stone tool cultures. OSF Preprints, ver. 7, peer-reviewed and recommended by Peer Community in Archaeology.
https://doi.org/10.31219/osf.io/x8m4j

Submitted: 01 December 2021, Recommended: 16 May 2022

Cite this recommendation as:
Blasco, R. (2022) Open glossary for wood technologies. *Peer Community in Archaeology*, 100015.
10.24072/pci.archaeo.100015

Published: 16 May 2022

Wood is a widely available and versatile material, so it is not surprising that it has been a key resource throughout human history. However, it is more vulnerable to decomposition than other materials, and its direct use is only rarely recorded in prehistoric sites. Despite this, there are exceptions (e.g., [1-5] [6] and references therein), and indirect evidence of its use has been attested through use-wear analyses, residue analyses (e.g., [7]) and imprints on the ground (e.g., [8]). One interesting finding of note is that the technology required to make, for example, wooden spears was quite complex [9], leading some authors to propose that this type of tool production represented a cognitive leap for Pleistocene hominids [10]. Other researchers, however, have proposed that the production process for wooden tools could have been much easier than is currently thought [11]. Be that as it may, in recent years researchers have begun to approach wood remains systematically, developing analyses of natural and anthropogenic damage, often with the help of experimental reference samples.

In this work, the authors elaborate a comprehensive glossary as a first step towards the understanding of the use of wood for technological purposes in different times and places, as there is still a general gap in the established nomenclature. Thus, this glossary is a synthesis and standardisation of analytical terms for early wood technologies that includes clear definitions and descriptions of traces from stone tool-using cultures, to avoid confusion in ongoing and future studies of wood tools. For this, the authors have carried out a detailed search of the current literature to select appropriate terms associated with additional readings that provide a wide, state-of-the-art description of the field of wood technology.

An interesting point is that the glossary has been organised within a *chaîne opératoire* framework divided into categories including general terms and natural traces, and then complemented by an appendix of images. It is important to define the natural traces –understanding these as alterations caused by natural processes–because

they can mask those modifications produced by other agents affecting both unmodified and modified wood before, during or after its human use.

In short, the work carried out by Milks et al. [6] is an excellent and complete assessment and vital to the technological approach to wooden artifacts from archaeological contexts and establishing a common point for a standardised nomenclature. One of its particular strengths is that the glossary is a preprint that will remain open during the coming years, so that other researchers can continue to make suggestions and refinements to improve the definitions, terms and citations within it.

[1] Oakley, K., Andrews, P., Keeley, L., Clark, J. (1977). A reappraisal of the Clacton spearpoint. Proceedings of the Prehistoric Society 43, 13-30. https://doi.org/10.1017/S0079497X00010343

[2] Thieme, H. (1997). Lower Palaeolithic hunting spears from Germany. Nature 385, 807-810. https://doi.org/10.1038/385807a0

[3] Schoch, W.H., Bigga, G., Böhner, U., Richter, P., Terberger, T. (2015). New insights on the wooden weapons from the Paleolithic site of Schöningen. Journal of Human Evolution 89, 214-225. https://doi.org/10.1016/j.jhevol.2015.08.004

[4] Aranguren, B., Revedin, A., Amico, N., Cavulli, F., Giachi, G., Grimaldi, S. et al. (2018). Wooden tools and fire technology in the early Neanderthal site of Poggetti Vecchi (Italy). Proceedings of the National Academy of Sciences. 115, 2054-2059. https://doi.org/10.1073/pnas.1716068115

[5] Rios-Garaizar, J., López-Bultó, O., Iriarte, E., Pérez-Garrido, C., Piqué, R., Aranburu, A., et al. (2018). A Middle Palaeolithic wooden digging stick from Aranbaltza III, Spain. PLoS ONE 13(3): e0195044. https://doi.org/10.1371/journal.pone.0195044

[6] Milks, A. G., Lehmann, J., Böhner, U., Leder, D., Koddenberg, T., Sietz, M., Vogel, M., Terberger, T. (2022). Wood technology: a Glossary and Code for analysis of archaeological wood from stone tool cultures. Peer-reviewed and recommended by PCI Archaeology https://doi.org/10.31219/osf.io/x8m4j

[7] Nugent, S. (2006). Applying use-wear and residue analyses to digging sticks. Mem Qld Mus Cult Herit Ser 4, 89-105. https://search.informit.org/doi/10.3316/informit.890092331962439

[8] Allué, E., Cabanes, D., Solé, A., Sala, R. (2012). Hearth Functioning and Forest Resource Exploitation Based on the Archeobotanical Assemblage from Level J, in: i Roura E. (Ed.), High Resolution Archaeology and Neanderthal Behavior: Time and Space in Level J of Abric Romaní (Capellades, Spain). Springer Netherlands, Dordrecht, pp. 373-385. https://doi.org/10.1007/978-94-007-3922-2_9

[9] Ennos, A.R., Chan, T.L. (2016). "Fire hardening" spear wood does slightly harden it, but makes it much weaker and more brittle. Biology Letters 12. https://doi.org/10.1098/rsbl.2016.0174

[10] Haidle, M.N. (2009). How to think a simple spear?, in: de Beaune S.A., Coolidge F.L., Wynn T. (Eds.), Cognitive Archaeology and Human Evolution. Cambridge University Press, New York, pp. 57-73.

[11] Garofoli, D. (2015). A Radical Embodied Approach to Lower Palaeolithic Spear-making. Journal of Mind and Behavior 36, 1-26.

Reviews

Evaluation round #2

DOI or URL of the preprint: **https://osf.io/x8m4j**
Version of the preprint: v3

Authors' reply, 12 May 2022

Many thanks to the reviewers and recommender for the further details regarding the glossary. We have aimed to make those further changes that we are able to make at this point and with further communication to continue to revisit some of the disagreements and confusions around particular terms such as 'shaping facets' and 'sawing'. We have rewritten some sections of the introduction to improve the clarity and accuracy. We have also fixed the figure numbering errors, and made some fixes to the German translations of terms, ensuring they are fully consistent with changes to the English. We have also added the two suggested references. As stated in the introduction, the intention is for this to continue to be a recursive, collaborative process during the development of some key ongoing projects analysing prehistoric wood technologies, and we continue to welcome feedback, new evidence and contributions from other researchers. On behalf of my coauthors I would like to thank all for a constructive and positive experience,

Annemieke Milks

see attached file for details

Download author's reply

Decision by Ruth Blasco, posted 25 April 2022

Minor revision

We have carried out a new review round so that the referees could assess the changes made to the manuscript. All three reviewers have positively assessed the modifications and think that the manuscript is practically ready to be accepted pending a few small changes.

Reviewed by Oriol López-Bultó, 23 April 2022

The authors have applied considerable and appreciated changes to the original manuscript after the first revision. Also, the addition of images to illustrate the glossary is great input. The paper has undoubtedly increased its quality and it is going to be a reference text for future scientific works on wood Technology in prehistory.

Even though there are still some minor changes that could be applied in order to improve the quality:

- 2nd paragraph – at the first sentence of the paragraph the word "subaquatic" could be changed to waterlogged.
- 5th paragraph "Organisation" – the organisation of the seven blocks of the glossary is not properly explained; from the way this paragraph is written it is understood that there are only five blocks on the glossary. It is not understood that "general terms" and "natural terms" are going to be two blocks of the glossary, even less the two first ones. Consider rewriting this paragraph.
- Figure 1 – same as the previous observation. Provably, adding "general terms" and "natural terms" blocks in the figure will help in a better understanding.
- Paragraph "Future versions" – is a very interesting point, unluckily the way this "open" database will work in the future lacks further explanation.
- Glossary – on the glossary the figures do not follow numeric order. This should be reviewed to avoid confusion.

Reviewed by Eva Francesca Martellotta, 22 March 2022

The work undertaken by Milks et al. has to be recognised as a valuable contribution to the study of ancient wooden technologies. The creation of a shared glossary is the first step of a path towards more experimental,

traceological and technological understandings of wooden tools.

The authors integrated most of my suggestions regarding technological and usewear terms. They conducted the reviewing process with respect and showed the willingness to present the best version possible of their manuscript.

After reading this second version, I will definitely recommend this work for publication.

Reviewed by Paloma Vidal-Matutano, 18 March 2022

As I said in the previous version of the manuscript, this is an excellent and comprehensive work, very necessary for the technological approach to wooden artefacts from archaeological contexts as there is still a general gap in established nomenclature. In addition, the last version of this work has been significantly improved by adding some of the issues suggested by the evaluators (initial discussion of ways of wood preservation, etc.).

In addition to this, and after reading the other reviewers' comments, I must thank the authors for having valued the work carried out in the Canary Islands with the dried wooden artefacts, not always cited when referring to dried wooden artefacts elsewhere. The preservation of archaeological wood by drying occurs, as the authors of the work point out, in places other than South America, and there are also studies carried out in Africa (Egypt, the Canary Islands, etc.) where this type of preservation also takes place. On the other hand, as mentioned by the authors in the "Terms and Code" section, I understand that what is important in a work of these characteristics (a glossary that will serve for the consultation of all those specialists working on the technological analysis of wooden artefacts) is not so much the number of articles referenced but the mention of those on which the authors have based themselves to define or redefine the concepts. I completely agree with the author's reply about the nature of this work: a referenced glossary and not a review paper. And this is where this work is extremely relevant, as it brings together those (few) works that do define and describe concepts of the chaîne operatoire applied to the technological analysis of wooden artefacts. Unfortunately, the still lack of established nomenclature hinders intra-site comparisons.

I agree with some reviewers that the terms should follow a certain order within each "phase". The latest version of the manuscript actually incorporates an alphabetical order within each phase and it's now much easier to consult. Some of the concepts have been reorganised in other folders, making more sense. However, I do not support the idea of creating more folders or sub-folders as suggested in some reviews. I believe that subdivisions in a glossary run the risk of making the information less accessible and more difficult to consult. I appreciate that there are terms referring to taphonomy as, although it is not directly related to technological analyses, it does influence them. In this sense, archaeoentomological analyses are sometimes combined with xylological and technological analyses providing interesting results about wood use, choices, wood degradation patterns and the chaîne opératoire itself (Martín-Seijo, 2020; Vidal-Matutano et al., 2021a).

In Phase 1 (Manufacturing), I would suggest to nuance the definition of "shaping facet" as these facets, produced with volcanic lithic tools in the Canary Islands, are very often < 1 cm. In addition, these marks are not necessary produced using an adze (this tool did not exist during the Prehispanic period of the Canary Islands, for example).

Regarding the term "sawing mark", described in Vidal-Matutano et al., 2021b, I agree with some reviewers that can lead to confusion. We defined this tool mark as the result of cutting a piece of wood (in fact, it was mentioned in the paper as a synonym of "cutting mark"). These marks reflect a parallel direction carried out with a uni or bidirectional movement in continuous contact with the wood at different angles close to 90º. This action yields straight linear negatives of different lengths with V-shaped or irregular sections. Obviously, we didn't refer to a mark made by a saw but I agree that it could be confusing. Thus, I could understand if the authors decided to omit this term.

I also agree with the fact that adding more photographs (macro and micro) would help a better understanding of the terms, as often the definition is not enough (we may be referring to different things with the same term). In this sense, I think that adding some photographs from different geochronological contexts would improve

the future version of this work as it would show the great diversity of tool marks that can be observed using different lithic tools.

References mentioned in the review (not necessarily to be added):

Martin-Seijo, M. (2020). The presence of decayed wood in Iron Age contexts of northwest Iberia: wood-borer galleries and fungal hyphae. Environmental Archaeology. DOI: 10.1080/14614103.2020.1829294.

Vidal-Matutano, P.; Delgado-Darias, T.; López-Dos Santos, N.; Henríquez-Valido, P.; Velasco-Vázquez, J.; Alberto-Barroso, V. (2021). Use of decayed wood for funerary practices: archaeobotanical analysis of funerary wooden artefacts from Prehispanic (ca. 400 – 1500 CE) Gran Canaria (Canary Islands, Spain). Quaternary International, 593-594: 384-398.

Evaluation round #1

DOI or URL of the preprint: https://osf.io/x8m4j

Authors' reply, 15 March 2022

The final version for recommendation has been uploaded to the preprint server: 10.31219/osf.io/x8m4j

Download author's reply

Decision by Ruth Blasco, posted 04 January 2022

PCI Archaeology #229: revision

We have received comments from four reviewers on your manuscript. You will see that, while they find your work of interest, they have raised some points that need to be addressed by a revision.

Please pay special attention to the clarifications that the reviewers make on the definitions, as well as some relevant points to include in the Introduction (e.g., irreversible damage during the recovery-conservation period and the differences in woodworking according to the different types of societies). Please also consider doing a more extensive bibliographic review of the studies of wooden artifacts, in addition to those carried out at European sites.

My congrats because all reviewers agree the manuscript will be a useful tool for all specialists working on wood technology and could become a basic starting point for a unified terminology.

Reviewed by Paloma Vidal-Matutano, 27 December 2021

This manuscript is a necessary work for the analysis of wooden artefacts. One interesting and attractive point is that it presents the glossary in table format, classifying it into logical categories (from raw-material to post-excavation). The authors have done an excellent and comprehensive work, very necessary for a technological approach to wooden artefacts from archaeological contexts, as there is still a general gap in established nomenclature. I highly recommend the publication of this manuscript, which will be a very useful tool for all specialists working on this issue. My congratulations to the authors for doing such a thorough job of reviewing nomenclature and thinking through terms.

Some minor changes:

Page 9, "puncture": Do you mean drilling? Maybe it's a term that should depend on the size of the hole?

Page 11, "Fungal infestation": The degree of fungal decay is also classifiable. See works from Blanchette (natural contexts) and from Moskal del Hoyo, Henry et al. and Vidal Matutano et al. (archaeological contexts).

Page 11: Maybe "xylophagous insect" should be described, as they can also be observed. "Faecal pellets" too, as they are useful to identify the insects.

Page 21, "stop mark": Maybe the Hayden's Ho Ho classification (1979) (step, hinge, faether) should be here included?

Reviewed by **Oriol López-Bultó**, 30 December 2021

General comments:

Wooden elements have always been part of the archaeological record, especially in certain areas as the British Isles, the alpine regions, or Scandinavia. But it has been in recent years when tools are thoroughly been studied following techniques and principles developed to study other materials as the logical-analytical System, Use-wear and tool-marks analysis or the idea of chaîne opératoire. This paper summarizes the observations and descriptions of the most relevant publications about this topic of the last 20-30 years, paying special attention to the new research developed from the last 6 years till nowadays.

Given the relevance of the topic approached and the increasing literature related to it, this paper looks very promising and could become a basic starting point (meaning citations) for many and relevant future publications in international journals. Therefore, it is worthy to consider its publication.

Despite that, in my opinion, the manuscript would benefit from some general and specific observations to increase its potential.

- The paper summarizes more than 100 definitions and observations, which is an admirable effort and a huge amount of work. But the amount of information displayed or the way it is organised could compromise de efficiency or the clarity during the reading.
- In the title and the first sentence of the abstract the authors specifically put the focus on the technological aspects, which seems like an adequate point of view. But later on, the scope of the manuscript widens to taphonomy, use, raw materials concepts, and so on, making the manuscript very large and, maybe, difficult to work with. The authors should consider omitting the concepts that go far from the technological scope or, at least, reduce it to the more basic and essential to understand the manufacturing concepts. Otherwise, they should modify the title, abstract and introduction.
- Some of the concepts seem a little bit out of place, and I would suggest the creation of subfolders, maybe inside the "GENERAL TERMS" phase for, at least, anatomical/ dendrological concepts. Or even consider the creation of a new PHASE.
- Inside some of the folders, some concepts are parts or subdivisions of more general concepts already explained. I would suggest creating some sort of hierarchy inside every "PHASE", so it is visibly clear how some concepts are part or belong to a more general concept: e.g., Bark – inner bark, outer bark, cambium; Wood – sapwood, heartwood, earlywood, latewood, pith, …

At the same time, if this hierarchy is applied, the codes should be modified to state this hierarchy.

- Some of the definitions or the concepts themselves could be confusing, the reader could benefit from some pictures or drawings.
- The concepts in between every Phase follow no order whatsoever. If the intention is to consult this paper as a reference "dictionary" they should follow some order, at least alphabetical.
- In the third paragraph of the introduction, the authors clearly state a very interesting point which is that this manuscript "can be updated, added to and improved […] from our colleagues". This idea is basic and strengthens in a great manner the relevance of this publication for future investigations, but it is not explained how this is planned to be. The authors should explain in some way how it is planned to happen.

Specific observations:

"GENERAL TERMS"

- This phase is the more extended and, at the same time, the less specific. In "GENERAL TERMS" are described morphological, anatomical or dendrological terms, as well as general aspects. The reading would benefit from their aggrupation. I suggest creating "subfolders" inside the "GENERAL TERMS" phase at least for anatomical/dendrological terms (cross-section, tangential section, radial section…), and a subfolder for morphological terms should be considered.
- "Drying crack" should be moved to the "TAPHONOMY" folder.

"PHASE 1 MANUFACTURE"

- Even though the introduction and title of the paper clearly state that it focuses on stone-tools societies, the concept “Sawing mark” can be confusing. Even more when the concept of the saw itself is defined by the presence of sharp teeth or a dentated edge. It is true that, as the author correctly refers, Vidal-Matutano et al use this concept refers to a repetitive motion with a stone blade, but it still sounds confusing. Maybe the authors should consider modifying the concept as “sawing with a smooth blade” and provably adding the concept “sawing with a dentated blade” given that the resulting tool-mark could be definitively different.
- Some concepts as “wood chip”, “wood shaving”, “point”, “round wood”, … are not technological concepts. Unquestionably they are the result of a manufacturing process, but not part of this process. At least, they should be moved to the “RAW MATERIAL” folder or even better to a new “Morphology” folder.

“PHASE 2 USE, MAINTENANCE, DISCARD”

- the terms refereeing to maintenance, conceptually, should be moved to “PHASE 1 MANUFACTURE” instead.

“RAW MATERIAL”

- Some of the concepts are extremally basic, even for a non-specialist reader. The reading would be easier and smoother if some of them were omitted: e.g., wood, bark, …
- Some of the concepts should be moved to a new suggested subfolder for anatomical/dendrological terms (maybe inside “GENERAL TERMS”): e.g., earlywood, latewood, callus tissue, compression wood, tension wood, …

Reviewed by **Eva Francesca Martellotta**, 09 December 2021

The article by Milks et al. consists of a glossary for the traceological analysis of wooden tools in archaeological contexts. In general, this article aims to contribute significantly to the study of ancient wooden artefacts - a topic not yet systematically investigated, neither from an archaeological nor experimental perspective.

The authors clearly stated the objects of the work. The cited literature is relevant and up to date. I appreciated the idea of a modifiable glossary to leave room for future improvements on the terminology and how the authors considered the overlapping of terms, fundamental to start the path towards a unified terminology.

I am not able to give any feedback on the German glossary.

Please consider the following suggestions.

- p. 8: does the ’warped (Wa)’ term also include alterations due to modifying wooden tools’ shape using fire? If that is the case, it might be helpful to include it in the definition by specifying that such attributes could be ascribed to both anthropic (e.g., manufacturing processes) and natural modification (e.g., natural bushfires).
- p. 8: in the attributes of ’Striation (Str)’, I would suggest enriching the definition of ’density’ by adding an ’overlapping’ or ’superposed’ category. In the case of anthropogenic agents, a greater density of the marks might give information regarding the intensity of use of the tool.
- p. 9: in ’Puncture (Pu)’, it might be appropriate to explain the definition of ’hole’ better. Is it considered a complete perforation - that is, from side to side of the tool - or does it also include incipient perforations? It could be useful to discern anthropogenic and animal agents.
- p. 9: the term ’Notch (No)’ is also used to describe surface damages owing to the use of wooden tools as retouchers (Martellotta et al., 2021). It might be helpful to add a synonym in this glossary to avoid confusion.
- p. 11: the authors define ’beaver traces (BT)’ as gnawing marks, but they also cite the use of beaver teeth as tools by humans. I imagine that these two marks appear different, so I suggest adding a new term to identify the marks caused by the use of beaver teeth as tools or specify in the current definition of BT that this term does not describe marks produced by an anthropogenic agent.
- p. 12: ’root (Roo)’ is defined as primarily underground parts of the tree, but this is not true for some species (for instance, mangroves and other tropical trees).
- p. 22: is ’signature (Sig)’ intended to be similar to the ’micro-striations’ observed in cutmarks on bones (Fernandez-Alvo and Andrews, 2016)? If that is the case, it might be helpful to use the same term or add ’micro-striations’ as a comparative synonym with osseous traceology (like it was done with SiF).

- I would suggest adding the term 'peeling' as a surface modification: it is relatively common on wooden items, often associated with fractures, and could have natural or anthropogenic origins.
- I think it would be helpful to specify if all the cited surface damage is caused by natural or anthropic agents or both - unless this information is not available.
- Overall, I think this work would beneficiate if more information regarding the observation method for each surface damage were provided, e.g., low-power or high-power approach and if the observed sample is archaeological or experimental. I imagine most surface damages are easily distinguishable from one another; however, it would be helpful to know which degree of observation is required to appreciate the detailed descriptions in this glossary. Although I acknowledge that this could be the focus for a future version of the glossary, I think this information could already be available within the rich literature the authors cited.

I remain available for any further discussion.

Reviewed by Laura Caruso Fermé, 14 December 2021

Dear Editor,

The work done is interesting and necessary for the development of specific studies on the study of wooden artifacts and the production sequences related to woody raw materials. Given my experience and trajectory in the study of wooden artifacts belonging to different types of societies (hunter-gatherers; Neolithic), recovered in different types of contexts (completely dry and submerged or underwater) and geographical areas (Europe and South America), I think that it would be important to consider some aspects in this initial phase of the construction of the glossary.

In the first place, I consider that it would be necessary to explain the different conservation contexts of wooden artifacts. This point is extremely relevant since the conservation conditions are those that will determine and condition the type of study carried out on the different artifacts.
In general, the recovery of wooden artifacts occurs in water logged contexts and in archeological deposits with highly humid sediments. In these cases, as the wood is submerged in water during long periods of time, it loses part of its components (cellulose and hemicellulose) due to hydrolysis, acquiring a soft consistence without mechanic resistance. The recovery of artifacts in this kind of contexts needs certain conservation techniques. During the recovery-conservation period, these artifacts may undergo tensions and contractions of the woody fibers causing not only small deformations but also irreversible damages. On the contrary, the recovery of wooden artifacts in completely dry contexts, without significant fluctuations in temperature and humidity is not frequent.
I think that it is important to explaining these questions in the introduction , because the type of conservation context of the artifacts will condition and determine the type of traces that are preserved on their surface. The studies carried out with this kind of artifacts allowed to observe different kinds of traces that prove, for example the polishing and shining of the wood surface (e.g., Caruso Fermé, 2012, 2015, 2021; Caruso Fermé et al., 2014; Caruso Fermé et al., 2015; Caruso Fermé et al., 2020).
In the second place, I think it is also important to highlight the differences in woodworking according to the different types of societies. Among hunter-gatherer groups, characterized by a great variability in the frequency and type of movements, the wastes or discards linked to wood work will be scarce and will respond to the needs inherent to societies with high residential mobility (Caruso Fermé, 2012, 2015; Caruso Fermé et al., 2011; Caruso Fermé et al 2014; Caruso Fermé et al., 2015; Caruso Fermé

and Aschero, 2020). On the other hand, in contexts corresponding to agropastoral societies the wood work can leave a great amount of discards linked to the construction of habitat structures and manufacturing of tools (López Bulto et al., 2020; Caruso Fermé et al., 2021). I think that this point will be important for the study of the production sequences and use of woody raw material and the study of the wooden artifacts.
Finally, I suggest doing a more extensive bibliographic review of the studies of wooden artifacts, in addition to those carried out on European sites. This information will give the glossary a higher quality and would show that it was organized based on the reading of various investigations.

THE GLOSSARY

-Phase 0 (raw material)

I do not understand the classifications made in Phase 0 (raw material) very well. I think it would be important to differentiate the natural traces from the anthropic ones.

-Phase 1 (manufacture)

I suggest incorporating as categories:

-wood debarking

-wood roughing

-wood polishing

Papers are recommended in the pdf. In these papers these types of traces are explained with microscope images (in archaeological wood and current wood)

- Phase 2 (use)

I suggest incorporating as categories:

-bright polish

-polish in longitudinal direction or horizontal direction

Papers are also recommended in the pdf.

Finally, I consider that the revised paper has an interesting objective and shows bibliographic research work. However, I suggest incorporating more readings on works dedicated to the study of wood as raw material among societies of the past. I consider that a more exhaustive review would strengthen and reinforce the glossary presented. On the one hand, it would show a broader knowledge about the study of woody raw materials. On the other hand, it would add the knowledge of all researchers who have a trajectory in the study of these topics, regardless of the geographical context, in addition to recent publications.
The revised pdf provides authors with a list of publications.

Download the review