May 28, 2024

Differentiation between different soft hammers stigmats, quantitative and traceological approach

DOI
dx.doi.org/10.17504/protocols.io.eq2lyw3mmvx9/v1

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OPEN ACCESS

DOI: dx.doi.org/10.17504/protocols.io.eq2lyw3mmvx9/v1

Protocol Citation: Jean-Thomas Vie, zixuan shen 2024. Differentiation between different soft hammers stigmats, quantitative and traceological approach. **protocols.io** https://dx.doi.org/10.17504/protocols.io.eq2lyw3mmvx9/v1

Protocol status: In development
We are still developing and optimizing this protocol

Created: April 19, 2024

Last Modified: May 28, 2024

Protocol Integer ID: 98495

Keywords: Lithic, Soft hammer, Stigmats

Abstract

Many studies in archaeology focus on the traces associated with stone knapping during prehistory, debating their correlation with the techniques used (Clément, 2021; Pelegrin, 2000). However, it is important to note that these traces are intimately linked to the physical qualities of the rock, as well as its response to the gesture, force, and experience of the knapper. These criteria can lead to a diversity of marks but can also introduce biases into the analysis, especially as the sensitivity of some rocks varies when struck. Thus, the complexity of interpreting knapping traces intensifies when adopting a qualitative approach, highlighting the multitude of factors to consider for precise analysis.

Furthermore, the historical approach to the analysis of soft percussion use has primarily focused on specific regions such as Europe (Roussel et al., 2009), North Africa (Sari, 2016), the Middle East (Pelegrin and Inizan, 2013), and the United States. These analyses have largely relied on locally available materials, such as limestone, deer antler, or boxwood. Consequently, they offer a limited perspective and may not necessarily generalize results to other geographical or ecological contexts. Additionally, while the use of different soft percussors and their identity have been established in areas where deer are found, many questions remain regarding the identity of the soft percussor in historically deer-free ecological zones. Acquiring soft percussors from animal wood is not possible, but the use of other materials such as hard vegetal wood may have played a similar role.

Through experimental flake production and the traceological study of marks on the platforms of these productions resulting from soft percussion, it would be possible to determine specific traces associated with vegetal soft percussion.

Therefore, we try to compare knapping by different percussors (three soft hammers and one hard hammer) on different raw materials, and observe their dimensional data and technical characteristics.

Attachments

INFO EXPE .pdf

417KB

Experiment record.xl...

21KB

some test results.pp...

659KB

Materials

Stone knapping :

- 4 nodules per type of rocks, ranging in size between 10 and 25cm in length, 10 and 20cm in width, and 4 and 10cm in thickness:
  - Sandstone quartzite
  - Quartzite
  - Flint
  - Quartz

In our case we will use local raw material form the Tokaj Region of Hungary :
  - Limnosilicite
  - Quartz Porphyry

- Percussors :
  - Volcanic rock percussor
  - Boxwood percussor

In our case we will use local percussor form the Tokaj Region of Hungary :
  - Deer antler percussor
  - Cornus Wood percussor
  - Limestone percussor
  - Long bone (great mammal)

Video :
-camera
-tripod

Storage :
-small bags
-paper
-pen

Analysis :
- Dinolite
- RTI
- R studio

Safety warnings

Knapping can be dangerous; we highly recommend wearing glasses, gloves, and protective clothing to prevent any injuries.

Before start

Be sure to conduct this experimentation in a controlled environment to avoid any contamination of archaeological sites.

Camera setting

1 Place the camera in front of the experimentator

2 run the carmera and the experimentator explain what do he want to produce

Selection of a specific raw material

3 Select Raw material : Sandstone quartzite, Quartzite, Flint, Quartz

4 Preparation of the elongated flake core：

5 Preparation of a bifacial preform while opening somes striking platforms (optional)

5.1 Choosing the suitable hammer：1 Boxwood percussor、2 Deer antler percussor、3 Soft rock percussor such as sandstone or limestone、 4 bone hammer

Knapping with different hammers in order to produce flakes

6 Use hammer from low to high hardness to produce flakes :
Soft rock percussor, volcanic rock percussor.
We plan to knap in the order of Sandstone quartzite, Quartzite, Flint, Quartz. For each raw material, we use the hammer in order to get 10 flakes (i.e., for each raw material, we will get 40 flakes totally）

7 please use only *tangential gesture*

8 first produce 10 flakes with Boxwood percussor

9 Store each flake with a paper explaining the type of hammer the raw material the gesture of production position in the dicritical schema with a number or on the excel document

10 10 flakes with bone percussor

11 Store each flake with a paper explaining the type of hammer the raw material the gesture of production position in the dicritical schema with a number or on the excel document

12 10 flakes with Deer antler percussor

13 Store each flake with a paper explaining the type of hammer the raw material the gesture of production position in the dicritical schema with a number or on the excel document

14 10 flakes with soft rock percussor

15 Store each flake with a paper explaining the type of hammer the raw material the gesture of production position in the dicritical schema with a number or on the excel document

16 you can also store the core used to produce the flakes

Data record

17 Macro Mesurments

17.1 technological Leght of the piece

17.2 widness of the flake

17.3 thickness of the flake

17.4 widness of the talus

17.5 thickness of the talus

17.6 Hackel

17.7 morphology of the bulb

17.8 lip

17.9 ripples

17.10 Bulb scar

17.11 angle de
chasse (dorsal talus angle)

17.12 flaking angle (ventral talus angle)

17.13 presence of point of impact

18 Micro trace (micro ware on talus)

18.1 smached residue and strations
Take a picture if there is one and describe it

18.2 craks

18.3 hertzian cone 40x 50x zoom
angle of the cone
size of the cone
smached crack

18.4 scar small removal retouchings

18.5 stration

Data analysis

19 mean comparaison test

19.1 max and min size

19.2

19.3

20 boxplot

20.1 see the size of the flakes

20.2

21 qualitative approcha

Protocol references

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