The Quartzite and Quartz Reference Collection from the CENIEH (Spanish National Research Centre on Human Evolution), Spain: An Online Database for Characterising a Wide Diversity of Lithic Raw Materials

Journal of open archaeology data

DATA PAPER

ubiquity press

ALEJANDRO PRIETO
PAULA CRISTÓBAL
JAVIER LLAMAZARES GONZÁLEZ
FELIPE CUARTERO

*Author affiliations can be found in the back matter of this article

ABSTRACT

The dataset presented here is the quartzite and quartz reference collection from the National Research Centre of Human Evolution of Spain (CENIEH), Burgos. This dataset or *online lithotheque* consists of 73 archaeological and geological samples obtained in different projects in which the CENIEH has been involved in the last 15 years. Most of the samples described here were collected from the Iberian Peninsula, while a few others were chosen from Eastern Africa. The samples have been petrographically described using thin section, stereomicroscopy and *de visu* petrographic observations and they have been characterised according to their petrogenesis. This dataset consists of a comprehensive report, an alphanumeric dataset with relevant features and an extensive picture archive. The dataset collection is stored at the CENIEH and it is open for researchers who want to use it for establishing their reference collection and describing quartzites in archaeological contexts.

CORRESPONDING AUTHOR:
Alejandro Prieto
Researcher at the GIZAPRE Research Group, Department of Geography, Archaeology and Prehistory, University of the Basque Country, Justo Vélez de Elorriaga, 1, 01006, Vitoria-Gasteiz, Spain
alejandro.prieto@ehu.eus

KEYWORDS:
Geoarchaeology; Petrology; Raw material Reference Collection; Lithotheque; Iberia; Africa

TO CITE THIS ARTICLE:
Prieto A, Cristóbal P, Llamazares González J, Cuartero F 2024 The Quartzite and Quartz Reference Collection from the CENIEH (Spanish National Research Centre on Human Evolution), Spain: An Online Database for Characterising a Wide Diversity of Lithic Raw Materials. *Journal of Open Archaeology Data,* 12: 10, pp. 1–8. DOI: https://doi.org/10.5334/joad.128

(1) OVERVIEW

CONTEXT

Raw material studies have been mainly focussed on tracing the origin of the rock artefacts discovered in archaeological sites [1]. The distance in which a resource is separated from its geological source means the distance that humans moved or exchanged a particular material. This allowed the archaeologist to infer the extension of economic human territories [*e.g.*, 2], determine prehistoric migrations [*e.g.*, 3], or measure the significance of the social and interchange networks in the past [*e.g.*, 4]. Furthermore, the characterisation of these rocks allows the understanding of the contexts where rocks were procured [*e.g.*, 5], the potential selective mechanism to obtain them [*e.g.*, 6], and even the reasons behind their exploitation [*e.g.*, 7].

How are we characterising these rocks? How should we describe them to make reliable descriptions? Should we need frames of reference to compare rock descriptions? And how are we sharing the knowledge we are producing?

In this paper, we address these questions by the presentation of the quartzite and quartz *lithotheque* from the CENIEH (Cenieh_LithoQ). This collection is made of 73 samples that have been petrographically described through their thin sections and their surfaces, combining destructive and high-resolution techniques with non-destructive ones. The wide geographic and geological variety of the stored samples (Table 1) and the absence of a particular hypothesis to address when analysing the materials have challenged the description of the samples and have made us think of the aforementioned questions.

The dataset here presented shows the collection and how their samples were characterised and classified according to the petrogenesis of the material. The characterisation of the inner and the cortical areas has also been carried out to understand the evolution of the stones in different geological environments. These methods have produced reliable and comparable descriptions of abiotic raw materials constituting a cornerstone for studies that trace the origin of stones, determine the selection degree of raw materials or describe the management strategies put in practice by past populations [8–10].

PROJECTS	QUANTITY OF SAMPLES
Litho.Aranbaltza	1
Litho.Arlanpe	1
Litho.Arlanzón	22
Litho.CuestaBajada	7
Litho.Gorliz	1
Litho.Hornos	1
Litho.Miño	8
Litho.NaiborSoilNdogo	2
Litho.Olduvai	1
Litho.Olmos de Atapuerca	19
Litho.PeñaMiel	1
Litho.PinedadelaSierra	3
Litho.TercerNaibor	2
Litho.Tormes	1
Litho.Urola	1
Litho.Utrillas	2

(Contd.)

Table 1 Specific projects that CENIEH was involved in and where analysed samples came from. The number of samples per project is shown in the second column.

It is important to acknowledge that quartzite is a well-represented lithic raw material in Palaeolithic contexts, making up 40% of the raw materials in the Palaeolithic of the Cantabrian Region [11], and its study has been subdued because of the importance given to other raw materials by archaeologist, especially, chert and obsidian [12, 13]. The presented dataset also underlines the wide variety of rocks that have been classified under the term "quartzite" by archaeologists and field geologists [8, 14, 15]. They range from sedimentary quartz-arenite to pure quartz. In this case, a coarse-grained limestone previously classified as quartzite in the absence of petrographic observations highlight this variability (Figure 1). This dataset tries to adhere to the concepts of reliability, comparability and accessibility with the creation of this online and open-based *lithotheque*, a common and always evolving practice developed in raw material research [*e.g.*, 16–20].

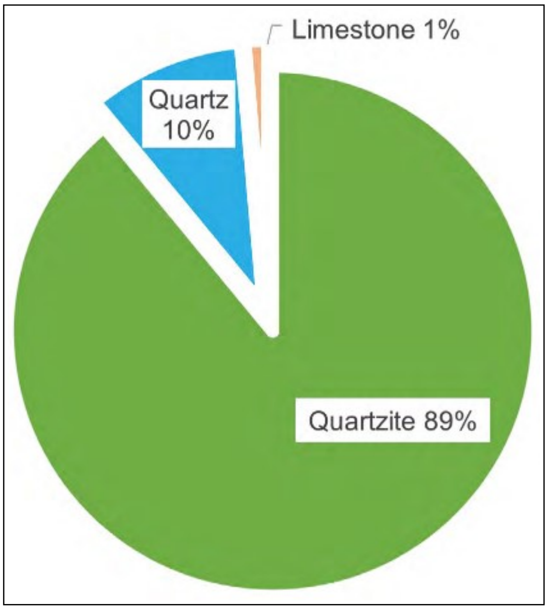

Figure 1 Pie chart representing the samples according to their main lithology.

SPATIAL COVERAGE

This dataset is composed of quartz and quartzites from the Iberian Peninsula (Spain, Europe): Castille and Leon, Basque Country, Aragon and Tanzania, Africa. The coordinate system used is the World Geodesic System (WGS-1984). The study is encompassed on the following geographic boundaries (Figure 2):

Northern boundary: + 43.430012
Southern boundary: – 2.9764610
Eastern boundary: + 35.360778
Western boundary: – 5.52475

TEMPORAL COVERAGE

The temporal coverage of the following dataset includes material from different geological units that range from the Precambrian Era to the Quaternary. Archaeologically, the contexts analysed include sites associated with the Lower, Middle, and Upper Palaeolithic (also Middle and Later Stone Age for the African context). The information offered in this dataset could also be used to characterise quartz and quartzites from different periods because the methodology used is not restrained to any particular chronology.

(2) METHODS

STEPS

The first step was the sampling of the stones. Sampling processes have involved different research teams and projects and the objective of each has determined the sample chosen.

The second step was the surface characterisation using stereoscopes, digital microscopes and *de visu* observations following the protocol stabilised here [9, 21]. Cortical and inner areas were analysed. Four scales of observation were applied, ranging from naked-eye description to ×250 magnification using the Dino-Lite digital microscope and stereomicroscopes. Photomicrographs were captured and features were used to classify quartzites into petrogenetic types, determining grain-size mean value and non-quartz minerals. Most of the pieces were photographed in a flat position at ×50 and ×250 magnification to create a library of reference pictures. We preferentially used the Dino-Lite model AD7013MZT with polarised light to eliminate most of the surface lustre. The microscope was handled with the MS35B vertical stand. We used the software Dino-Capture 2.0. The stereomicroscope used was the Nikon SMZ800, with up to ×120 magnifications. Macroscopic and microscopic pictures of rock surfaces were taken in the inner and the external (cortical) areas of the samples. For a more detailed methodological overview, see the Supplementary methodological information (Section 2.1). The third step consists of the analysis of thin sections using a petrographic microscope. Thin sections were done at the "Thin sections and Soil Micromorphology Laboratory" from the CENIEH. Thin section petrography adhered to the methodology proposed here [8, 12, 14, 15, 22–31]. Again, microscopic pictures were taken for its publication and features were used to classify quartzites into petrogenetic types, determining grain-size mean value and non-quartz minerals. For a more detailed methodological overview, see the Supplementary methodological information (Section 2.2).

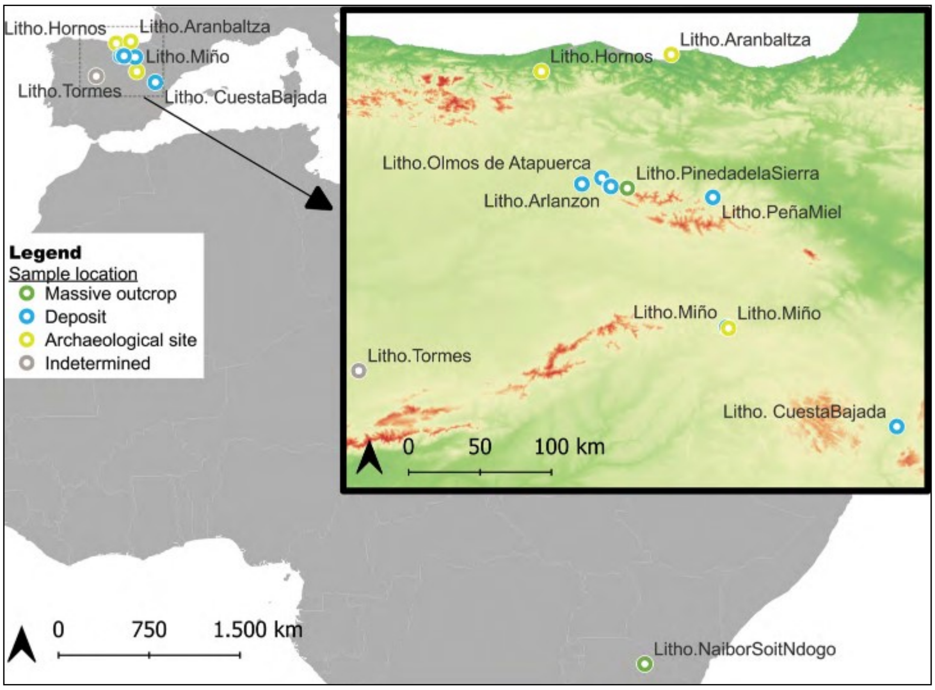

Figure 2 Map of the special coverage of the database. In the detailed map, we show the area of the Iberian Peninsula where most of the samples have been analysed. Samples are grouped by their geographic locations and they were classified according to the type of location taken.

The fourth and last step consisted of the synthesis of the data and the creation of the report in which each sample is described and classified according to their most relevant features.

SAMPLING STRATEGY

The sampling process has involved different research teams and projects and the objective of each project determined the samples chosen. These projects, geographically and chronologically constrained around particular archaeological sites were not exhaustive and did not encompass the full variability of quartzites and quartz from the outcrops, deposits or archaeological sites where these samples came from. Although the sampling processes in each project had been different, these samples were merged into this *lithotheque,* encapsulating the wide range of rocks archaeologists and field geologists named quartzite [8, 14].

In all the cases, the samples from geological environments were selected to be compared with archaeological ones. They were selected by different researchers following *de visu* examinations and, although it is proven this approach is not resolutive enough for a proper petrographic characterisation, they show similitudes with the archaeological materials from these areas. Samples from archaeological contexts were artefacts.

In this dataset, we analysed all quartzites, quartz and the only limestone stored in this section of the CENIEH Litho project. The inclusion of the latter stone reinforces the variability of the term quartzite without petrographic examinations giving relevance to these techniques to characterise and classify abiotic resources.

QUALITY CONTROL

All samples have been examined by the first two researchers of the article in two different moments, assessing the quality of the descriptions. In addition, and for quarantining non-destructive descriptions, different parts of the same objects have been analysed.

CONSTRAINTS

There are two different constraints in this dataset. The first is related to the sampling strategy. The samples from the CENIEH were here stored as the consequence of different research projects, generating an absence of sampling strategy driven by field observations or a particular archaeological/historical hypothesis. This resulted in a diverse and extended chronology and geography that turned into an opportunity to understand what is referred to as quartzite by archaeologists. This includes a wide diversity of quartzite types such as sedimentary quartz-arenites, deformed orthoquartzites and a wide diversity of *sensu stricto* quartzites and quartzes, making this dataset a cornerstone to understanding a wide diversity of materials. Therefore, this exploratory dataset does not encapsulate the variability presented in the wide geographic and geologic coverage of the project but a wide variability of stones named as quartzite. The second constraint refers to the quantity of a few of the samples. Some of them were too small to have different surfaces for their research. This was especially true for the CENIEH.035 and CENIEH.221.

(3) DATASET DESCRIPTION

OBJECT NAME

- The CENIEH_LithoQ_Report, Comprehensive Report: Cenieh_LithoQ_Report.pdf

  The overall sample distribution is shown in Figure 3.

- Supplementary methodological information: Cenieh_LithoQ_Methodology.pdf
- An alphanumeric dataset containing the information of 71 samples. The quantity of fields per sample is 83: Cenieh_LithoQ_Dataset.xml

  The following systematic scheme shows the quartzites classified by their petrogenetic type, grain size and mineral/colour-related varieties (Figure 4)

- Image dataset: 1363 pictures at different scales and analytical methods organised by samples: Cenieh_LithoQ_images.rar

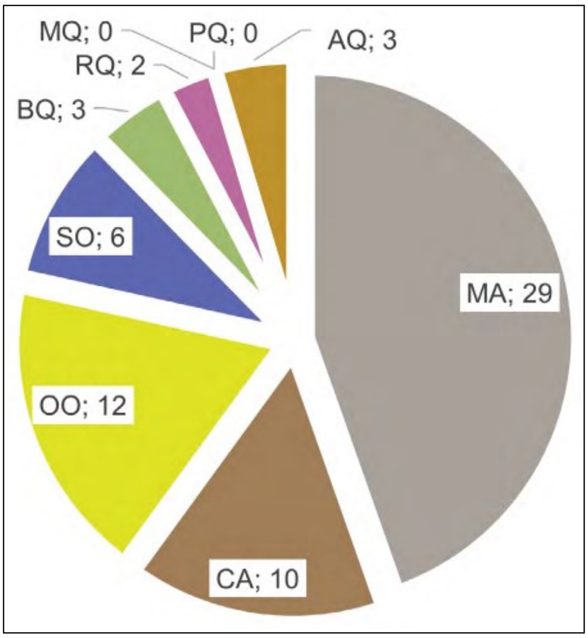

Figure 3 Pie chart representing the quartzite samples according to their petrogenetic types. MA: Clastic fabric with Matrix or non-quartz cement quartz Arenite; CA: Clastic Quartz arenite; OO: syntaxially Overgrown Orthoquartzite; SO: Sutured grain Orthoquartzite; BQ: Bulging recrystallized Quartzite; RQ: subgrain Rotation recrystallized Quartzite; MQ: grain boundary Migration recrystallized Quartzite; PQ: Polygonal grains recrystallised Quartzite; and AQ: Abnormal Coarsening Grain Recrystallised Quartzite (AQ).

DATA TYPE

PDF file: Processed data/final report
PDF file: Supplementary methodological information
XLS Table file: Secondary Data
Compressed file with images: Primary data
Physical format samples (thin sections and stones) are stored at the CENIEH. Primary data. They are available under permission here: https://www.cenieh.es/infraestructura/colecciones/litica.

FORMAT NAMES AND VERSIONS

.pdf, .xls, and .rar containing .jpg images

CREATION DATES

The start date: 04/05/2023
The end date: 17/04/2024

DATASET CREATORS

Alejandro Prieto
Paula Cristóbal
Javier Llamazares
Felipe Cuartero
Joseba Ríos-Garaizar
Patricia Bello
Aixa San Emeterio
Ana Álvarez

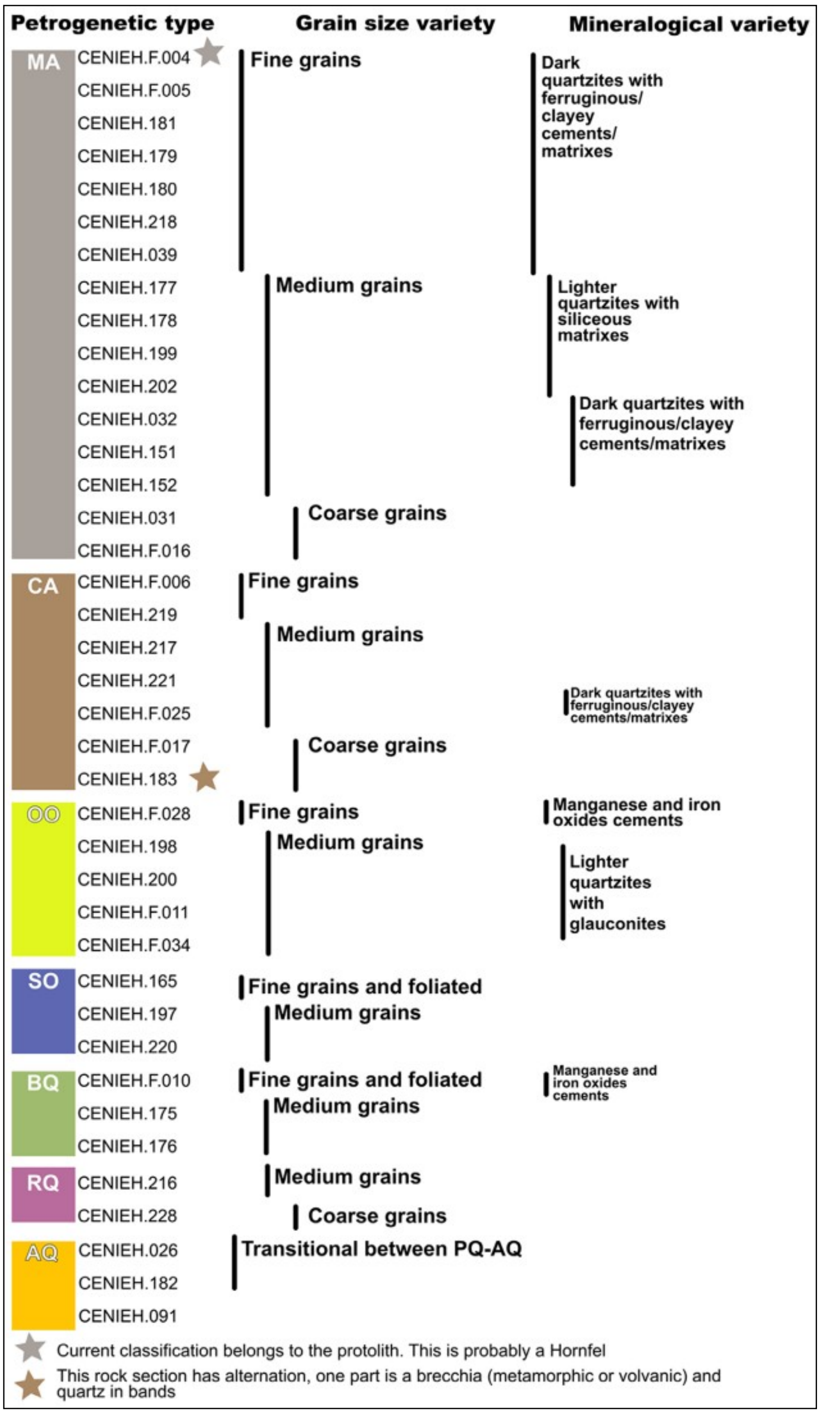

Figure 4 Scheme with the quartzite types and most relevant grain size and mineral varieties presented in this dataset.

LANGUAGE
English

LICENSE
Creative Commons Attribution 4.0 International

REPOSITORY LOCATION
ZENODO: https://doi.org/10.5281/zenodo.11198773

PUBLICATION DATE
15/05/2024

(4) REUSE POTENTIAL

The characterisation of the rocks selected, transported and knapped by past populations has constituted a relevant topic in Prehistoric Archaeology. The creation of specific reference collections that visually compare archaeological and geological samples has been a common practice among researchers, especially chert *lithotheques*. Moreover, these reference collections are not usually freely and online distributed and rarely refer to quartzite or quartz, both common lithic resources used during the Palaeolithic.

This dataset is useful as a cornerstone for raw material research in the areas where the samples have been collected. The visual comparison with other rocks could be easily done thanks to the huge quantity of microscopic and mesoscopic pictures that this dataset presents. Therefore, the potential reuse includes the tracer of the origin of quartzites in different areas and the understanding of the determining petrologic factors that involved knapping and use properties.

The wide diversity of rock that archaeologists have classified as quartzite is also reflected here. This dataset could be used to understand this diversity, increasing its potential reuse as a source of information to understand this rock in these two and many other areas. The potential reuse also includes teaching and education purposes, as we are offering photographic resources that illustrate petrified sedimentary and metamorphic processes in silica rocks. The potential reuse of this dataset in teaching and education also refers to the features of quartzite shown in this dataset, particularly in the method section where all features described in the dataset were illustrated and detailed explained.

Thanks to the universal character of the methodology applied and the features here analysed and presented (reinforced by the methodological supplementary report), this dataset can potentially be reused to construct similar *lithotheques* and/or carry out other projects that involve the petrographic characterisation of these lithic resources.

Finally, we would acknowledge that this *lithotheque* could enrich and be enriched by similar projects and we are open to creating new lines of collaboration to validate the dataset and collaborate in future methodological improvements.

DATA ACCESSIBILITY STATEMENT

The authors confirm that the data supporting the findings of this study are available within the article, the supplementary files and at the free repository: https://doi.org/10.5281/zenodo.11198773. Access to the thin section and hand specimens is possible at the CENIEH facilities under permission.

ACKNOWLEDGEMENTS

We thank María Martinón-Torres (Head of the CENIEH) for allowing us to publish this dataset, contributing to the spread of science. We also thank Carlos Sáinz Domínguez for his work on preparing the thin sections. Finally, we would like to thank Joseba Ríos-Garaizar, Patricia Bello, Aixa San Emeterio and Ana Álvarez for having collected the samples in different projects [32–34] and their acceptance in the publication of this dataset.

FUNDING INFORMATION

This dataset was created thanks to the research collaborative contract between Alejandro Prieto and the CENIEH in a transference contract managed by Euskoiker (TR42170) and funded by the CENIEH.

Alejandro Prieto was funded by the Spanish Ministry of Science and the European Funds Next Generation through a Maria Zambrano Fellow (MAZAM 21/22) and he is part of the Spanish Ministry of Science and Innovation Projects: RED2022-134387-T, PID2021-125098NB-100, PID2021-126937NB-100 and PID2020-114462GB-I00. Alejandro Prieto is a member of the GIZAPRE Research Team "evolución humana, cambio climático y adaptación cultural en las sociedades preindustriales" (IT-1435-22).

Felipe Cuartero was funded by the Spanish Ministry of Science and Innovation as Technician of the Laboratory of Experimental Archeology and Taphonomy in the CENIEH (grant agreement: PTA2020-019183-I).

COMPETING INTERESTS

The authors have no competing interests to declare.

AUTHOR CONTRIBUTIONS

Alejandro Prieto: Conceptualisation; Methodology; Software; Formal Analysis; Writing – Original draft and Review and Editing; Visualisation.

Paula Cristóbal: Formal Analysis; Writing -Review and Editing; Visualisation.

Javier Llamazares González: Writing -Review and Editing; Resources; Validation.

Felipe Cuartero: Writing -Review and Editing; Resources; Validation.

AUTHOR AFFILIATIONS

Alejandro Prieto orcid.org/0000-0002-3853-525X
Researcher at the GIZAPRE Research Group, Department of Geography, Archaeology and Prehistory, University of the Basque Country, Justo Vélez de Elorriaga, 1, 01006, Vitoria-Gasteiz, Spain

Paula Cristóbal orcid.org/0009-0002-5269-8415
Predoctoral Researcher at the Institute of Prehistory from the Department of History, Geography and Communication, University of Burgos, Paseo de los Comendadores, s/n 09001, Burgos, Spain

Javier Llamazares González orcid.org/0000-0002-2847-465X
Laboratory Technician at the Experimental Archaeology and Taphonomy, CENIEH, Paseo Sierra de Atapuerca, 3, 09002, Burgos, Spain

Felipe Cuartero orcid.org/0000-0002-9024-2980
Researcher at the ERC-MULTIPALEOIBERIA-StG, Department of History and Phylosophy, University of Alcalá, Spain

REFERENCES

1. **Burke A.** Chert, Silex, and Obsidian Sourcing. In *The Encyclopedia of Archaeological Sciences*. 2018; 1–5. DOI: https://doi.org/10.1002/9781119188230.saseas0088
2. **Turq A,** *et al.* Building models of Neanderthal territories from raw material transports in the Aquitaine Basin (southwestern France). *Quaternary International*. 2017; 433, Part B, pp. 88–101. DOI: https://doi.org/10.1016/j.quaint.2016.02.062
3. **Cann JR, Renfrew C.** The characterization of obsidian and its application to the Mediterranean region. *Procceding of the Prehistory Society*. 1964; 30: 111–133. DOI: https://doi.org/10.1017/S0079497X00015097
4. **Calvo A, Arrizabalaga A.** Piecing together a new mosaic: Gravettian lithic resources and economic territories in the Western Pyrenees. *Archaeological and Anthropological Sciences*. 2020; 12: 282–304. DOI: https://doi.org/10.1007/s12520-020-01231-x
5. **Bamforth DB.** The Windy Ridge quartzite quarry: hunter-gatherer mining and hunter-gatherer land use on the North American Continental Divide. *World Archaeology*. 2006; 38(3): 511–527. DOI: https://doi.org/10.1080/00438240600813871
6. **Prieto A,** *et al.* Quartzite procurement, not only in fluvial deposits: raw material characterisation of the lithic assemblage from Level XXII-R at El Esquilleu, Cantabrian Region, Spain. *Journal of Lithic Studies*. 2021; 8(2): 34. DOI: https://doi.org/10.2218/jls.4492
7. **Schmidt P,** *et al.* The driving force behind tool-stone selection in the African Middle Stone Age. *Proceedings of the National Academy of Sciences*. 2024; 121(10): e2318560121. DOI: https://doi.org/10.1073/pnas.2318560121
8. **Prieto A, Yusta I, Arrizabalaga A.** Defining and Characterizing Archaeological Quartzite: Sedimentary and Metamorphic Processes in the Lithic Assemblages of El Habario and El Arteu (Cantabrian Mountains, Northern Spain). *Archaeometry*. 2019; 61(1): 14–30. DOI: https://doi.org/10.1111/arcm.12397
9. **Prieto A, Yusta I, Arrizabalaga A.** From petrographic analysis to stereomicroscopic characterisation: a geoarchaeological approach to identify quartzite artefacts in the Cantabrian Region. *Archaeological and Anthropological Sciences*. 2020; 12(1): 32. DOI: https://doi.org/10.1007/s12520-019-00981-7
10. **Fernandes P, Raynal J-P.** Pétroarchéologie du silex: un retour aux sources. *Comptes Rendus Palevol*. 2006; 5(6): 829–837. DOI: https://doi.org/10.1016/j.crpv.2006.04.002
11. **Prieto A, Arrizabalaga A, Yusta I.** Lithic Raw Material in the Cantabrian Region: Dialectical relationship between flint and quartzite in the Palaeolithic record. *Journal of Lithic Studies*. 2021; 8(1): 31. DOI: https://doi.org/10.2218/jls.4334
12. **Prieto A.** *Procurement and management of quartzite in the Cantabrian Region: The Middle and Upper Palaeolithic in the Deva, Cares and Güeña Valleys. Departamento de Geografía, Prehistoria y Arqueología*. PhD. Universidad del País Vasco; 2018. Available at: http://hdl.handle.net/10810/36644.
13. **Prieto A,** *et al.* How to deal with an elephant in the room? Understanding “non-flint” raw materials: characterisation and technological organisation. *Revista ArkeoGazte*. 2022; 12: 73–98. Available at: https://arkeogazte.org/monografico-los-animales-en-el-arte-prehistorico/.
14. **Tarriño A,** *et al.* The crystalline quartz-rich raw material from Olduvai Gorge (Tanzania): why is it called quartzite when it should be called quartz? *Archaeological and Anthropological Sciences*. 2023; 15(6): 78. DOI: https://doi.org/10.1007/s12520-023-01774-9
15. **Howard JL.** The Quartzite Problem Revisited. *The Journal of Geology*. 2005; 113(6): 707–713. DOI: https://doi.org/10.1086/449328
16. **Herrero-Alonso D,** *et al.* LegioLit: Knappable material lithotheque in the Prehistory Laboratory at the University of León, Spain. *Journal of Lithic Studies*. 2018; 5(2). DOI: https://doi.org/10.2218/jls.2926
17. **Sánchez de la Torre M,** *et al.* The LithicUB project: A virtual lithotheque of siliceous rocks at the University of Barcelona. *Journal of Lithic Studies*. 2014; 1(1). DOI: https://doi.org/10.2218/jls.v1i1.756
18. **Driscoll K, Burke A, Warren G.** Introducing LIR (Lithotheque Ireland), a reference collection of flaked stone tool raw materials from Ireland. *Journal of Lithic*

Studies. 2016; 3(2). DOI: https://doi.org/10.2218/jls.v3i2.1444

19. **Biró K, Dobosi VT.** *Lithotheca – Comparative raw material collection of the Hungarian National Museum*. Budapest: Hungarian National Museum; 1991.
20. **Mangado Llach X, Sánchez de la Torre M.** Las litotecas de materias primas silíceas. Retos y propuestas para una investigación en red en el siglo XXI. In *Las materias primas líticas en la prehistoria del Pirineo y la región cantábrica*. 2023; 251–258. Vitoria-Gasteiz: Servicio Editorial de la Universidad del País Vasco (Veleia: Series Minor, 41).
21. **Prieto A,** *et al.* Quartzite procurement in conglomerates and deposits: Geoarchaeological characterization of potential catchment areas in the central part of the Cantabrian Region, Spain. *Geoarchaeology*. 2021; 36(3): 490–510. DOI: https://doi.org/10.2218/jls.4492
22. **Prieto A,** *et al.* Petrological characterisation of the "Tertiary quartzites" from the site of Troisdorf-Ravensberg (North Rhine-Westphalia, Germany): first insights in Middle Palaeolithic outcrop exploitation. *Quartär*. 2019; 66: 33–50. DOI: https://doi.org/10.7485/QU66_2
23. **Skolnick H.** The quarzite problem. *Journal of Sedimentary Petrology*. 1965; 35(1): 12–21. DOI: https://doi.org/10.1306/74D711E0-2B21-11D7-8648000102C1865D
24. **Wilson CJL.** The prograde microfabric in a deformed quartzite sequence, Mount Isa, Australia. *Tectonophysics*. 1973; 19(1): 39–81. DOI: https://doi.org/10.1016/0040-1951(73)90142-X
25. **Adams AE, MacKenzie WS, Guilford C.** *Atlas of sedimentary rocks under the microscope*. Essex: ELBS; 1988.
26. **Gil Crespo PP.** *Atlas de mineralogía óptica*; 2009. Available at: http://www.ehu.es/mineralogiaoptica/Atlas_de_Mineralogia_Optica/Atlas_de_Mineralogia_Optica.html (Accessed: 21 October 2014).
27. **MacKenzie WS, Adams AE.** *Atlas en color de Rocas y Minerales en Lámina Delgada*. Barcelona: MASSON S.A; 1997.
28. **Yardley BWD, Mackenzie WS, Guilford C.** *Atlas of metamorphic rocks and their textures*. Essex: Longman Scientific & Technical; 1990. DOI: https://doi.org/10.1111/j.1365-3121.1991.tb00877.x
29. **Hirth G, Tullis J.** Dislocation creep regimes in quartz aggregates. *Journal of Structural Geology*. 1992; 14(2): 145–159. DOI: https://doi.org/10.1016/0191-8141(92)90053-Y
30. **Soto M,** *et al.* Fingerprinting of quartzitic outcrops at Oldupai Gorge, Tanzania. *Journal of Archaeological Science: Reports*. 2020; 29: 102010. DOI: https://doi.org/10.1016/j.jasrep.2019.102010
31. **Favreau J,** *et al.* Petrographic Characterization of Raw Material Sources at Oldupai Gorge, Tanzania. *Front. Earth Sci.* 2020; 8(158). DOI: https://doi.org/10.3389/feart.2020.00158
32. **Rios-Garaizar J, Eixea A.** Lithic technological choices of late Neandertals in a mountain environment south of the Ebro Valley, Iberian Peninsula (Peña Miel level e). *Archaeological and Anthropological Sciences*. 2021; 13(7): 123. DOI: https://doi.org/10.1007/s12520-021-01360-x
33. **Rios-Garaizar J,** *et al.* Revisiting Hornos de la Peña 100 years after. *Journal of Archaeological Science: Reports*. 2020; 31: 102259. DOI: https://doi.org/10.1016/j.jasrep.2020.102259
34. **Rios-Garaizar J, Libano I, Garate D.** El yacimiento chatelperroniense al aire libre de Aranbaltza (Barrika, Euskadi). *Munibe*. 2012; 63: 81–92.

TO CITE THIS ARTICLE:
Prieto A, Cristóbal P, Llamazares González J, Cuartero F 2024 The Quartzite and Quartz Reference Collection from the CENIEH (Spanish National Research Centre on Human Evolution), Spain: An Online Database for Characterising a Wide Diversity of Lithic Raw Materials. *Journal of Open Archaeology Data,* 12: 10, pp. 1–8. DOI: https://doi.org/10.5334/joad.128

Submitted: 15 May 2024 **Accepted:** 14 August 2024 **Published:** 28 August 2024

Journal of Open Archaeology Data is a peer-reviewed open access journal published by Ubiquity Press.