

Reporting Summary

Nature Portfolio wishes to improve the reproducibility of the work that we publish. This form provides structure for consistency and transparency in reporting. For further information on Nature Portfolio policies, see our [Editorial Policies](#) and the [Editorial Policy Checklist](#).

Statistics

For all statistical analyses, confirm that the following items are present in the figure legend, table legend, main text, or Methods section.

n/a Confirmed

- | | | |
|-------------------------------------|-------------------------------------|--|
| ☐ | ☒ | The exact sample size (n) for each experimental group/condition, given as a discrete number and unit of measurement |
| ☐ | ☒ | A statement on whether measurements were taken from distinct samples or whether the same sample was measured repeatedly |
| ☐ | ☒ | The statistical test(s) used AND whether they are one- or two-sided
<i>Only common tests should be described solely by name; describe more complex techniques in the Methods section.</i> |
| ☒ | ☐ | A description of all covariates tested |
| ☐ | ☒ | A description of any assumptions or corrections, such as tests of normality and adjustment for multiple comparisons |
| ☐ | ☒ | A full description of the statistical parameters including central tendency (e.g. means) or other basic estimates (e.g. regression coefficient) AND variation (e.g. standard deviation) or associated estimates of uncertainty (e.g. confidence intervals) |
| ☐ | ☒ | For null hypothesis testing, the test statistic (e.g. F , t , r) with confidence intervals, effect sizes, degrees of freedom and P value noted
<i>Give P values as exact values whenever suitable.</i> |
| ☒ | ☐ | For Bayesian analysis, information on the choice of priors and Markov chain Monte Carlo settings |
| ☒ | ☐ | For hierarchical and complex designs, identification of the appropriate level for tests and full reporting of outcomes |
| ☒ | ☐ | Estimates of effect sizes (e.g. Cohen's d , Pearson's r), indicating how they were calculated |

Our web collection on [statistics for biologists](#) contains articles on many of the points above.

Software and code

Policy information about [availability of computer code](#)

Data collection

n/a

Data analysis

Software programs used for Uranium-series/Electron Spin Resonance dating: IsoPlotR, UThwigl, McDoseE 2.0, Matlab, DATA program, lolite. Software programs used for palaeomagnetic dating: PuffinPlot, IAPD 2000. No software was used for collection of primary field data.

For manuscripts utilizing custom algorithms or software that are central to the research but not yet described in published literature, software must be made available to editors and reviewers. We strongly encourage code deposition in a community repository (e.g. GitHub). See the Nature Portfolio [guidelines for submitting code & software](#) for further information.

Data

Policy information about [availability of data](#)

All manuscripts must include a [data availability statement](#). This statement should provide the following information, where applicable:

- Accession codes, unique identifiers, or web links for publicly available datasets
- A description of any restrictions on data availability
- For clinical datasets or third party data, please ensure that the statement adheres to our [policy](#)

The data supporting the findings of this study are provided in the Supplementary Information. Raw and additional Source data are available from publicly available Zenodo data repositories. Access to primary archaeological assemblages (e.g., stone artefacts, fossil fauna) is available to researchers upon reasonable request.

Research involving human participants, their data, or biological material

Policy information about studies with [human participants or human data](#). See also policy information about [sex, gender \(identity/presentation\), and sexual orientation](#) and [race, ethnicity and racism](#).

Reporting on sex and gender	n/a
Reporting on race, ethnicity, or other socially relevant groupings	n/a
Population characteristics	n/a
Recruitment	n/a
Ethics oversight	n/a

Note that full information on the approval of the study protocol must also be provided in the manuscript.

Field-specific reporting

Please select the one below that is the best fit for your research. If you are not sure, read the appropriate sections before making your selection.

☒ Life sciences ☐ Behavioural & social sciences ☐ Ecological, evolutionary & environmental sciences

For a reference copy of the document with all sections, see [nature.com/documents/nr-reporting-summary-flat.pdf](https://www.nature.com/documents/nr-reporting-summary-flat.pdf)

Life sciences study design

All studies must disclose on these points even when the disclosure is negative.

Sample size	The study comprised an archaeological excavation of Early Pleistocene fluvial sandstone deposits (Beru Member Sub-Unit B) at an open site (Calio) in the Walanae Depression of South Sulawesi, Indonesia. Systematic excavations were carried out at Calio in 2019 and 2021–2022, targeting an area on an ENE-WSW trending ridge. In 2019, we opened a total of six contiguous 1 m ² excavation units (denoted squares B1U1 to B1U6) using arbitrary 10-cm thick intervals (spits). The first square, B1U1, was initiated at the find site of Artefact 1. An additional nine one-metre square units (B2U1, B2U2, B2U3, B3U1, B3U2, B3U3, B4U1, B4U2 and B4U3) were placed on the west side of the previously excavated units in 2021–2022. The research sample consisted of a primary archaeological dataset (stone artefacts) recovered during the excavations. Sediment samples were also taken for palaeomagnetic dating and a vertebrate fossil (maxilla of extinct suid <i>Celebochoerus</i>) was collected for coupled Uranium-series/ESR dating. In the field, sample sizes were chosen based on available field conditions (e.g., visible fossil outcrop exposures) and time and budget constraints.
Data exclusions	There were no data exclusions.
Replication	It is possible that similar stone artefacts and fossil fauna findings will be recovered from future excavation of adjacent deposits. However, replication of primary field results is not strictly possible due to the nature of archaeological excavation, which destroys the sedimentary strata under excavation. Palaeomagnetic dating and U-series/ESR dating experiments can potentially be repeated on remaining samples.
Randomization	Not possible/relevant under primary field research conditions.
Blinding	Not possible/relevant under primary field research conditions.

Reporting for specific materials, systems and methods

We require information from authors about some types of materials, experimental systems and methods used in many studies. Here, indicate whether each material, system or method listed is relevant to your study. If you are not sure if a list item applies to your research, read the appropriate section before selecting a response.

Materials & experimental systems

n/a	Involved in the study
☒	☐ Antibodies
☒	☐ Eukaryotic cell lines
☒	☐ Palaeontology and archaeology
☒	☐ Animals and other organisms
☒	☐ Clinical data
☒	☐ Dual use research of concern
☒	☐ Plants

Methods

n/a	Involved in the study
☒	☐ ChIP-seq
☒	☐ Flow cytometry
☒	☐ MRI-based neuroimaging

Plants

Seed stocks	n/a
Novel plant genotypes	n/a
Authentication	n/a