**README file**

Data Set Title: **Data to perform geometric morphometric analyses of the Neanderthal upper first permanent molar GP1 from Grotta del Poggio**

Data Set Authors:

**Erica Piccirilli1, Rita Sorrentino2, Francesca Seghi1, Antonino Vazzana1, Maria Giovanna Belcastro2, Sahra Talamo3, Katerina Harvati4,5,6, Matteo Bettuzzi7, Maria Pia Morigi7, Gerhard Weber8,9, Giulia Capecchi10,11, Vincenzo Spagnolo11,12, Ivan Martini11, Adriana Moroni11,12,13, Francesco Boschin11,12,13, Stefano Ricci11, Stefano Benazzi1**

Affiliations:

1 Department of Cultural Heritage, University of Bologna, Italy.

2 Department of Biological, Geological and Environmental Sciences, University of Bologna, Italy.

3 Department of Chemistry G. Ciamician, University of Bologna, Italy.

4 Paleoanthropology, Senckenberg Centre for Human Evolution and Palaeoenvironment, Eberhard Karls University of Tübingen, Germany.

5 Institute for Archaeological Sciences, Department of Geosciences, Eberhard Karls University of Tübingen, Germany.

6 DFG Centre of Advanced Studies ‘Words, Bones, Genes, Tools’, Eberhard Karls University of Tübingen, Germany.

7 Department of Physics and Astronomy “Augusto Righi”, University of Bologna, Italy.

8 Department of Evolutionary Anthropology, University of Vienna, Austria.

9 Human Evolution and Archaeological Science (HEAS), University of Vienna, Austria

10 Department of Physical Sciences, Earth and Environment, University of Siena, Italy.

11 Department of Physical Sciences, Earth and Environment, Research Unit of Prehistory and Anthropology, University of Siena, Italy.

12 Centro Studi sul Quaternario (CeSQ ODV), Sansepolcro – Arezzo, Italy.

13 Istituto Italiano di Paleontologia Umana, Anagni, Italy.

Data Set Contact Person:

**Erica Piccirilli**, Department of Cultural Heritage, University of Bologna, Via degli Ariani 1, 48121, Ravenna, Italy. Email: [erica.piccirilli2@unibo.it](mailto:erica.piccirilli2@unibo.it)

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**Data Set Documentation**

**Abstract**

This dataset contains data used for two different geometric morphometric analyses of the Neanderthal upper first permanent molar GP1 from Grotta del Poggio. The samples were analyzed to assess the taxonomic attribution of GP1.

**Content of the folders and files**

The main folder “**GrottadelPoggio\_Data.zip**” contains:

1. file .RData “**2D\_crown\_outline**”: an R workspace saving data used in the second analysis, which can be loaded into an R environment.
2. file .xlsx “**2D\_crown\_outline\_csv**”: an export file containing the same data as the file .RData “**2D\_crown\_outline**”.
3. file .xlsx “**Table\_S2**”: an Excel spreadsheet showing details of the sample related to the “2D\_crown\_outline” RData and .xlsx file.
4. file .RData “**3D\_EDJ\_CEJ**”: an R workspace saving data used in the third analysis, which can be loaded into an R environment.
5. file .xlsx “**3D\_EDJ\_CEJ \_csv**”: an export file containing the same data as the file .RData “**2D\_crown\_outline**”.
6. file .xlsx “**Table\_S3**”: an Excel spreadsheet showing details of the sample related to the “3D\_EDJ\_CEJ” RData and .xlsx file.
7. file .docx “**README\_GrottadelPoggio**”

**Methodology**

The data are related to a study that aims to assess the taxonomic attribution of the upper first permanent molar GP1 from Grotta del Poggio (Cilento, southern Italy). Two different geometric morphometric methods were applied.

1. The first analysis is a 2D geometric morphometrics (GM) analysis of the crown outline. Coordinates of GP1 crown outline were extracted and analyzed according to guidelines previously described for this tooth class (Bailey et al., 2014(Hublin et al., 2017). For an extensive explanation of the methodology, please refer to the main text. The comparative sample comprised 124 individuals, including recent *H. sapiens* (RHS; n=80), Neanderthals (NEA; n=18); Upper Palaeolithic *H. sapiens* (UPHS; n=19) and early *H. sapiens* (EHS; n=7; Bailey et al., 2014). The coordinates of all specimens used in this analysis are here provided. All coordinates represent left UM1s (the right ones have been mirrored). A descriptive list of the comparative samples is available in Table S2.
2. The second analysis is a 3D GM analysis of the enamel-dentine junction (EDJ) and cemento-enamel junction (CEJ). Coordinates of GP1 EDJ and CEJ were extracted and analyzed according to the method proposed by Davies et al. (2024) and using a comparative sample of Neanderthals (NEA; n=13) and recent *H. sapiens* (RHS; n= 10) published therein and deposited in the Publications section of the Human Fossil Record (<https://human-fossil-record.org/index.php?/category/14230>). We further enlarged the comparative sample by adding other Neanderthals (NEA; n=6) early *H. sapiens* (EHS; n=2) and recent *H. sapiens* (RHS; n=14), whose coordinates were extracted as above (Smith et al., 2010; Gamarra et al., 2022; Quirin et al., 2024). For an extensive explanation of the methodology, please refer to the main text. The coordinates of all specimens newly generated in this work are here provided. All coordinates represent left UM1s (the right ones have been mirrored). A descriptive list of the comparative samples is available in Table S3.

**References**

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**Notes**

The present digital archive is the outcome of the paper: Piccirilli, E., et al. The human remains from the MIS 6 site of Grotta del Poggio (Cilento, southern Italy). A taxonomic and chronological reassessment. Under review in the American Journal of Biological Anthropology. Current research has been funded by the ERC AdG n. 101019659 - FIRSTSTEPS (PI: K. Harvati), the PRIN TRACE project (PIs: S. Benazzi and A. Moroni), and the National Geographic Society/Exploration Grant Program (grant NGS-61617R-19; PI: I. Martini). K. Harvati is also supported by the Carl Friedrich von Siemens Foundation. Past research and fieldwork at Grotta del Poggio were funded by the University of Siena.