



ELSEVIER

Contents lists available at ScienceDirect

Data in Brief

journal homepage: www.elsevier.com/locate/dib

Data Article

Data on the ^{14}C date obtained from the charcoal figure “Black fox” in Shulgan-Tash (Kapova) cave, Southern Ural, Russia

Yuri Dublyansky^{a,*}, Yuri Lyakhnitsky^b, Christoph Spötl^a^a Institute of Geology, Innsbruck University, Innrain 52, Innsbruck 6020, Austria^b A.P. Karpinsky Russian Geological Research Institute (VSEGEI), Sredny prospekt 74, St.-Petersburg 199106, Russian Federation

ARTICLE INFO

Article history:

Received 27 December 2017

Received in revised form

11 October 2018

Accepted 12 October 2018

Keywords:

Shulgan-Tash cave

Radiocarbon

Cave art

ABSTRACT

Shulgan-Tash (Kapova) cave in southern Ural, Russia, is the easternmost European site hosting Late Paleolithic cave art. Most of the 195+ drawings catalogued in the cave are made with red natural pigment (ochre), and only a handful of drawings are made with charcoal, see “Catalogue of images” [4], “Höhlenmalerei im Ural: Kapova und Ignatievka; die altsteinzeitlichen Bilderhöhlen im südlichen Ural,” [5]. “Constraining the ages of the Late Palaeolithic cave paintings in the Shulgan-Tash cave, Southern Urals, Russia” [6]. None of the charcoal drawings were directly dated by ^{14}C method so far.

Black lines delineating a figure similar to the outline of a fox are known in the cave. Here we present data on the ^{14}C AMS date of charcoal with which the lines were drawn. Calibration of the data was performed using the Bomb13NH1 dataset, see “Atmospheric radiocarbon for the period 1950–2010” [7] and the IntCal13 dataset, see “IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP” [8]. The calibrated age distribution has maximum probability density (65.3%) between 1877 and 1918.

© 2018 The Authors. Published by Elsevier Inc. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

* Corresponding author.

E-mail address: Yuri.Dublyansky@uibk.ac.at (Y. Dublyansky).

Specifications table

Subject area	Archaeological science
More specific subject area	Geochronology, history, archaeology
Type of data	Tables, photo images, graph
How data was acquired	The acceleration mass spectrometry (AMS) system at Oxford Radiocarbon Accelerator Unit (University of Oxford, UK)
Data format	Raw and analyzed
Experimental factors	Samples were treated with acid, base, acid sequence as per [1–3].
Experimental features	Samples were combusted in SHN analyzer furnace system, passed through a gas chromatograph and measured for $\delta^{13}\text{C}$ values. An aliquot of CO_2 collected from the He stream was mixed with hydrogen, reduced to graphite on an Fe catalyst and pressed into a target for the ion source as per [1–3].
Data source location	Shulgan-Tash (Kapova) cave; 53°2'34.80"N; 57°3'57.60"E; Russia
Data accessibility	Data is reported in this article.

Value of the data

- The data can be used by scientific community to constrain the age of charcoal of the lines, creating the figure “Black fox” in Shulgan-Tash (Kapova) cave, Russia.
- This is the first direct radiocarbon dating of a charcoal drawing in Shulgan-Tash cave can be used by archaeologists and historians studying the use of the cave by humans in the past.
- The data can be used to close the controversy as to whether this particular figure is of Paleolithic age or is a later artifact.

1. Data

Black charcoal lines, delineating a figure evocative of a running fox (Fig. 1) were sampled in the Hall of Drawings of the Shulgan-Tash (Kapova) cave in southern Ural, Russia. The length of the figure is 84 cm; its width is 18 cm. In contrast to several other charcoal drawings found in the cave, which are poorly preserved, faint and barely visible (and, therefore, not amenable to radiocarbon dating



Fig. 1. The “Black fox” figure on the ceiling of a niche in the western wall of the Hall of Drawings, Shulgan-Tash cave, Russia. Scale is 10 cm.



Fig. 2. Close-up on the lines. Charcoal from these lines was collected for ^{14}C dating. Width of frame is ca. 5 mm.

Table 1
Results of ^{14}C dating.

Sample ID	Provenance	Material	$\delta^{13}\text{C}$ (‰ VPDB)	F^{14}C	^{14}C date (yrs BP)
OxA-33323	Shulgan-Tash cave	charcoal	−27.32	0.99565 ± 0.00321	35 ± 26

Note: BP = Before present – AD 1950.

[4,5]) the lines composing the figure are sharp and bright, with discrete particles of charcoal clearly visible (Fig. 2). The figure was identified as a drawing, and assigned the name “Black fox” in Ref. [4 p. 94].

The data presented in this paper consist of photo documentation of the sample collection site (Figs. 1 and 2), the ^{14}C (AMS) dating results (Table 1), the results of calibration of the ^{14}C date (Table 2), and graphical representation of obtained dates (Fig. 3).

The data was calibrated using OxCal (v4.3.2; © Bronk Ramsey 2017) using the Bomb13NH1 curve [7], which is valid for latitudes north of 40°N and is prepended with the last 300 years of the IntCal13 dataset [8]. Calibrated dates and their probabilities are shown in Fig. 3 and Table 2.

2. Experimental design, materials, and methods

A sample was collected by chipping small grains of charcoal from different parts of the drawing with a scalpel. This technique allowed collection of sufficient amount of material without affecting the visual appearance of the drawing.

The sample was analyzed in the Research Laboratory for Archaeology and the History of Art, University of Oxford (UK). Preparation of the sample (id:OxA-33323) and analysis by Acceleration Mass Spectrometry (AMS) was performed according to protocols and procedures reported in Refs. [1–3]. The measured radiocarbon age was corrected for stable isotope fractionation using the measured value $\delta^{13}\text{C} = -27.3\text{‰}$ VPDB.

Table 2
Calibrated ^{14}C date of charcoal.

From (yrs AD)	To (yrs AD)	Probability (%)
68.2% probability		
1710	1718	7.9%
1828	1832	3.6%
1890	1910	55.4%
1955	1955	1.3%
95.4% probability		
1696	1725	16.2%
1814	1836	11.1%
1844	1851	1.3%
1877	1917	65.3%
1954	1955	1.4%

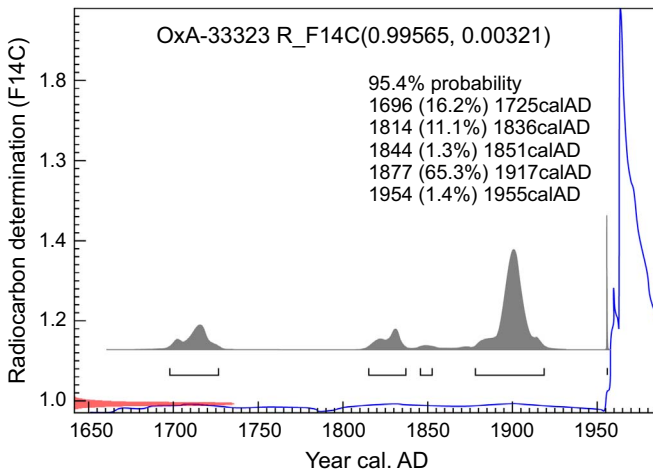


Fig. 3. Probability age distribution of a charcoal sample from the figure of “Black fox” in Shulgan-Tash cave (Russia) calculated using OxCal v4.3.2 ©Bronk Ramsey (2017). Blue line is the NH1 curve of [8].

Acknowledgments

Funding: This work was supported by a grant of the Head of Government of the Republic of Bashkortostan (RB), Russia R. Khamitov. Logistical support was provided by Scientific-Production Center for Protection and Use of Objects of Cultural Heritage, the Ministry of Culture of the RB, Russia. The aforementioned entities had no role in study design; in collection, analysis and interpretation of the data; in preparation of the report; and in the decision to submit the article for publication.

Transparency document. Supporting information

Transparency data associated with this article can be found in the online version at doi:<https://doi.org/10.1016/j.dib.2018.10.040>.

References

- [1] C. Ramsey, T. Gigham, P. Leach, Towards high-precision AMS: progress and limitations, *Radiocarbon* 46 (1) (2004) 17–24. <https://doi.org/10.1017/S0033822200039308>.
- [2] C. Ramsey, T. Higham, A. Bowles, R. Hedges, Improvements to the pretreatment of bone at Oxford, *Radiocarbon* 46 (1) (2004) 155–163. <https://doi.org/10.1017/S0033822200039473>.
- [3] C. Ramsey, T. Higham, D. Owen, A. Pike, R. Hedges, Radiocarbon dates from the Oxford AMS System: archaeometry Datelist 3, *Archaeometry* 44 (3, Supplement 1) (2002) S1–S149. <https://doi.org/10.1111/j.1475-4754.2002.tb01101.x>.
- [4] Y. Lyakhnitsky, O. Minnikov, A. Yushko, Drawings and Signs of Shulgan-Tash (Kapova) Cave, Catalogue of Images, Kitap, Ufa, 2013.
- [5] V. Šcelinskij, V. Širokov, *Höhlenmalerei im Ural: Kapova und Ignatievka; die altsteinzeitlichen Bilderhöhlen im südlichen Ural*, Thorbecke, Sigmar, 1999.
- [6] Y. Dublyansky, G.E. Moseley, C. Spötl, Y. Liakhnitsky, H. Cheng, R. Lawrence Edwards, Constraining the ages of the Late Palaeolithic cave paintings in the Shulgan-Tash cave, Southern Urals, Russia, in: *Proceedings of the International Symposium on “Ancient Sanctuaries: Archaeology, Ritual, Mythology”*, Institute for History, Ufa, 2016, pp.120–125.
- [7] Q. Hua, M. Barbetti, A. Rakowski, Atmospheric radiocarbon for the period 1950–2010, *Radiocarbon* 55 (4) (2013) 2059–2072. https://doi.org/10.2458/azu_js_rc.v55i2.16177.
- [8] P. Reimer, E. Bard, A. Bayliss, J. Beck, P. Blackwell, C. Ramsey, C. Buck, H. Cheng, R. Edwards, M. Friedrich, P. Grootes, T. Guilderson, H. Hafliðason, I. Hajdas, C. Hatté, T. Heaton, D. Hoffmann, A. Hogg, K. Hughen, K. Kaiser, B. Kromer, S. Manning, M. Niu, R. Reimer, D. Richards, E. Scott, J. Southon, R. Staff, C. Turney, J. van der Plicht, IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP, *Radiocarbon* 55 (4) (2013) 1869–1887. https://doi.org/10.2458/azu_js_rc.55.16947.