

The first Middle Palaeolithic site exhibiting obsidian industry on the northern slopes of the Central Caucasus

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Modern research in the Caucasus involving both obsidian artefact characterisation and sourcing enhances our knowledge of the early exploitation and exchange of this raw material (Le Bourdonnec *et al.* 2012; Montoya *et al.* 2013; Chatainger & Gratuze 2014; Doronicheva & Shackley 2014; Frahm *et al.* 2014; Pleurdeau *et al.* 2016).

The north-central Caucasus region—located between the highest European volcanic mountain peaks of Elbrus (5642m asl) and Kazbek (5034m asl)—is notable as the area producing the only obsidian source (called Baksan or Zayukovo) known in the Northern Caucasus. Here, obsidian is found as boulders, known as ‘volcanic bombs’, in pyroclastic and secondary contexts (e.g. river alluvium) close to the village of Zayukovo in the Baksan Valley.

Recent studies indicate that the Baksan obsidian source was a centre of attraction for both Middle Palaeolithic Neanderthals and Upper Palaeolithic modern humans (Doronicheva & Shackley 2014). Only three stratified sites, however, provide evidence of humans settling in the area during the terminal Pleistocene and early Holocene. These are the Sosruko and Alebastrovyy Zavod rockshelters, which were excavated in the 1950s, and Badynoko rockshelter, which was investigated in 2004 (Zamiatnin & Akritas 1957a & b; Zenin & Orlova 2006).

Our field surveys in 2016 discovered the first stratified Middle Palaeolithic site in the Baksan obsidian region. The site, Saradj-chuko Grotto, is located 934m asl and ~30m above the Saradj-chuko River (a tributary of the Baksan River), and approximately 6km from known obsidian sources (Figures 1–2). The cave opens to the south-east.

We excavated a test pit within the cave, which revealed a stratum (layer 6) composed of sandy loam 0.6m beneath the modern surface and containing rare ignimbrite debris. Layer 6 produced 24 perfectly preserved lithic artefacts and some bone fragments, including caprid teeth. All the lithic artefacts are made of black, smoky, brown, red-brown or speckled obsidian (Figure 3), apart from two tools made of light-grey flint. Three obsidian artefacts were analysed using the ThermoScientific *QuantX* EDXRF spectrometer in the

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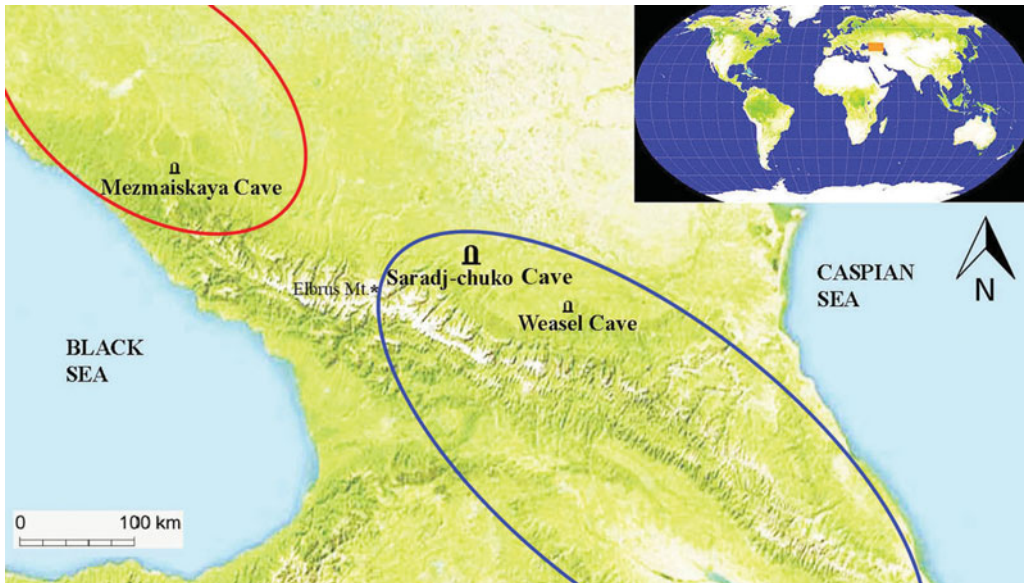


Figure 1. Map of the Caucasus showing the location of Saradj-chuko Grotto.



Figure 2. A view from Saradj-chuko Grotto.

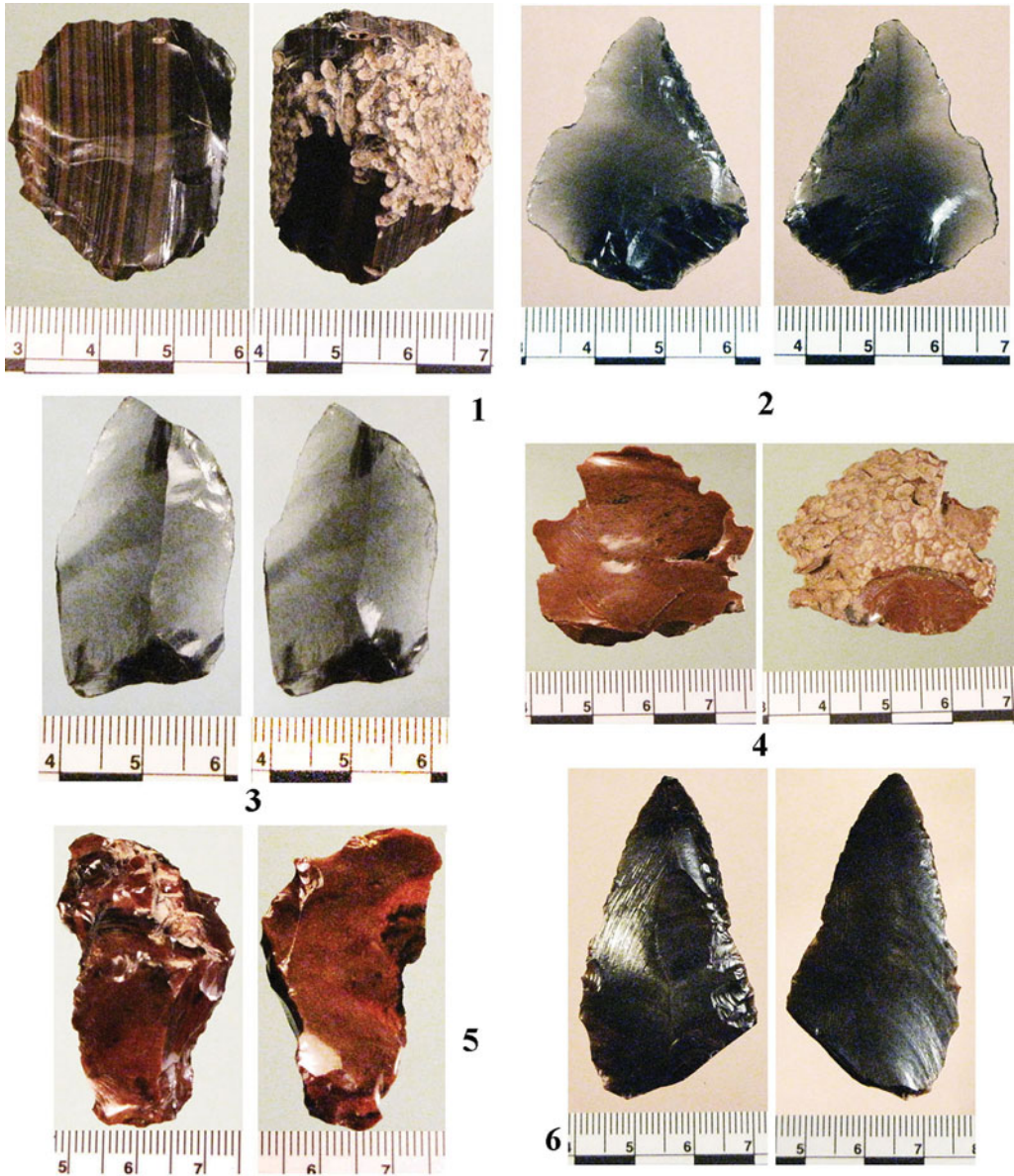


Figure 3. Obsidian artefacts from Saradj-chuko Grotto.

Geoarchaeological XRF Laboratory, Albuquerque (USA) (Table 1). Results showed that all the sampled artefacts were made of obsidian originating from the Baksan source.

The lithic assemblage includes a small bipolar core with prepared platforms (Figure 3: 1), a core trimming flake, 16 flakes, of which eight were modified into retouched tools, four shatters and two chips. There are also three blades, three laminar flakes and one Levallois triangular flake. Of nine flakes with preserved striking platforms, five have faceted platforms (Figure 4: 1, 6–7). Of the eight retouched tools, comprising three simple side scrapers

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Table 1. Elemental concentrations and source assignments for the archaeological specimens. All measurements are in parts per million.

Sample	Ti	Mn	Fe	Zn	Rb	Sr	Y	Zr	Nb	Ba	Pb	Th	Source
SRD-2016-N1	760	439	8880	52	283	54	26	75	14	224	52	32	Zayukovo
SRD-2016-N2	784	438	8951	60	283	53	27	75	14	205	49	21	Zayukovo
SRD-2016-N3	869	543	10395	73	316	62	27	78	18	184	55	25	Zayukovo
RGM1-S4	1528	296	13209	42	149	108	27	219	9	811	21	13	standard

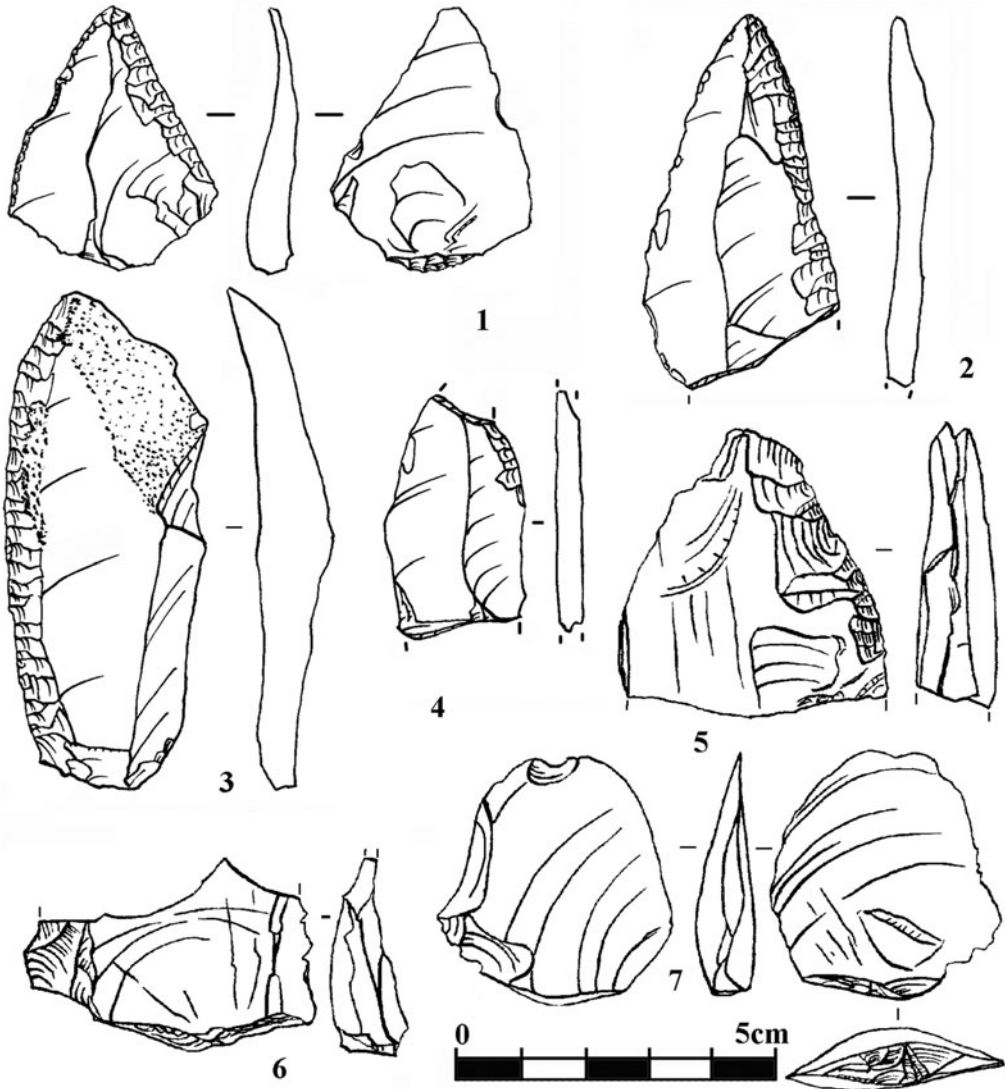


Figure 4. Illustrations of lithic artefacts from Saradj-chuko Grotto.

(Figure 4: 3 & 5), two Mousterian points (Figure 3: 2 & 6; Figure 4: 1 & 2), and three tool fragments (Figures 3: 3 & 4: 4), one is made from a Levallois triangular flake, and four from blades and laminar flakes. These technical-typological peculiarities allow us to define the industry initially as Levallois laminar Mousterian.

The industry from Saradj-chuko shows close similarity with Middle Palaeolithic industries known in neighbouring areas, such as those found during the 1950–1960s in small surface localities in the north-eastern Caucasus (Liubin & Beliaeva 2001) and in Weasel Cave in the Terek River upper basin (Liubin & Beliaeva 2001; Hidjrati *et al.* 2003). Furthermore, some of the tool types are characteristic of the Zagros Mousterian in the Lesser Caucasus (Golovanova 2015).

The Levallois and laminar characteristics, and the absence of bifacial tools, are in contrast with the Mousterian industry of Saradj-chuko and the entire north-central and north-eastern Caucasus, from the Eastern Micoquian industry of the north-western Caucasus (Figure 1). They also suggest an affinity with Mousterian industries in the Southern Caucasus. Further excavation and research at the Saradj-chuko site are required to clarify the chronology and the cultural peculiarities of the Middle Palaeolithic industry of the north-central Caucasus. Such further work may also illuminate the characteristics of obsidian exchange and possible cultural contacts among Middle Palaeolithic Neanderthal populations in the western and eastern areas of the Northern Caucasus, and in the Southern Caucasus.

Important issues of human evolutionary research include the settlement of large regions by Middle Palaeolithic hominins and contact among different Neanderthal groups. The dynamics of environmental change contributed greatly to the settlement of different regions during the Middle Palaeolithic, especially in the northern latitudes, and particularly in the Northern Caucasus (Liubin 1977; Golovanova & Doronichev 2003; Golovanova 2015). The discovery of the Saradj-Chuko site addresses a large gap in our knowledge of Neanderthal occupation of the Caucasus. The site has great potential to provide new information for a better understanding of Middle Palaeolithic cultural and technological variability, differences of subsistence and life-ways, and lithic raw material networking (obsidian exchange) across the Caucasus and the broader region of Eastern Europe and Western Asia.

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