



## Directly dated broomcorn millet from the northwestern Caucasus: Tracing the Late Bronze Age route into the Russian steppe



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### ABSTRACT

This paper provides new radiocarbon dates for preserved remains of broomcorn millet discovered in Bronze Age occupation layers at the Guamsky Grot rock shelter in the northwestern Caucasus. The millet grains directly date between the 12th–10th centuries BC, which complements dates obtained on wood and bone samples from the same layer. The pottery assemblage retrieved from layer 4/5 in Guamsky Grot where the millet was found has stylistic similarities with the Kobyakovo and proto-Maeotian cultures. Concentration of carbonized unhusked millet seeds in a fireplace together with fragments of flat calcined stones implies the seeds drying in the course of which the grains accidentally burned down. All Late Bronze Age sites in the West Caucasus where millet has been discovered represent kindred cultural traditions originating from the proto-Colchis, the Ochamchiri and the Dolmen cultures. Taking into account the finds of broomcorn millet in the Kobyakovo layer at the Safyanovo site (the Lower Don area), it may be suggested that the millet growing tradition north of the West Caucasus, probably, spread together with the West-Caucasian ‘Kobyakovo’ population, which were sedentary and established settlements in the Steppe: first in the Kuban River Region and then further northward – in the Lower Don River Region. It is precisely the region where the harvesting bronze sickles of the Kuban group came in to use in the second half of the second mill. BC.

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### 1. Background

The term millet refers to cultivated small-seeded grasses, which belong to the Panicoid subfamily and the Paniceae tribe. There were at least 18 millet species cultivated at various times in prehistory, many of which are still cultivated (Fuller, 2013) in different continents. Along with wheat, barley and rice, broomcorn millet (*Panicum miliaceum* L.) is one of the earliest domesticated plants, and has been an important source of vegetable carbohydrates and proteins for millennia. Depending on the localization of the wild ancestry, climatic conditions and cultural traditions, each of these grain species has its own history of domestication and spread. The history of broomcorn millet appears to be the most intricate and complicated.

Most scholars tend to agree that broomcorn millet was first domesticated in the northern parts of present-day China roughly 6000–5500 cal. BC, which is confirmed by finds of millet grains at several Early Neolithic sites (Weber and Fuller, 2008; Hunt et al., 2008; Bettinger et al., 2010; Zhao, 2011; Miller et al., 2016). Additional

supporting evidence comes from stable isotope studies of human and animal bones, which demonstrate a regular consumption of plants with a C<sub>4</sub> type of photosynthesis starting from the Early Neolithic exactly in the aforementioned region (Liu et al., 2012). A few scholars have suggested earlier dates for domestication, based on phytolith analyses (Lu et al., 2009); although, these claims require reliable morphological evidence for domestication using plant remains (Zhao, 2011; Zohary et al., 2012; Miller et al., 2016).

This research is complicated by the fact that the wild ancestor of broomcorn millet is still unknown (Zohary et al., 2012; Hunt et al., 2011, 2014); furthermore, the earliest finds of millet grains have been recorded, not only in Northern China, but also in Eastern Europe, specifically from the Caucasus (more than 30 sites: Hunt et al., 2008). However, recently conducted direct <sup>14</sup>C AMS-dating of ten millet samples from Neolithic layers (thought to pre-date 5000 BCE) at seven settlements in Central and southeastern Europe has revealed that all these finds are intrusive species. All of these grains turned out to be more recent than the mid-second millennium BC, and, in most cases, were more recent than 1000 BCE, some even dated to early medieval times (Motuzaitė-Matuzevičiūtė et al., 2013). Hence, the ancient designation of all of the earliest millet remains in Europe has been called into question.

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This study, along with other recent studies conducted to date grain remains (Borojevic, 2011; Stevens and Fuller, 2012; Pelling et al., 2015), has clearly demonstrated that the archaeological context of an archaeobotanical find (especially of small seed remains) does not always provide reliable information about its age. Hence, the issue of intrusive species poses a more significant research challenge now than it did a couple of decades ago. No matter how reliable the archaeological context would appear to be, the need to conduct direct radiocarbon dating, especially, for the earliest grains and seeds, as well as for plant species newly discovered in a specific region, is becoming more pressing.

Studying the history of the spread of domesticated grains, including millet, is an important component of the endeavor, aimed at reconstructing the way large population groups organized their subsistence systems. The top priority for our team is to determine where, when and in what natural and historical conditions millet was first cultivated once it reached the vast expanses between East Asia and Western Europe, reliably mapping the spread of this major food and forage crop. In many ways this goal coincides with the wider objectives declared in the ORIMIL Project, a French initiative headed by Estelle Herrscher (see <http://www.agence-nationale-recherche.fr/?Project=ANR-12-JSH3-0003>).

Our study aims to analyze the archaeological and cultural contexts of the first and so far, the only  $^{14}\text{C}$  dated millet sample from in a multi-layer site known as Guamsky Grot. These dated grains represent the only early direct dates for millet grains in the Western Caucasus.

## 2. Guamsky Grot: archaeological and cultural context

Guamsky Grot is a rockshelter located in the Northwest Caucasus approximately two kilometers from the Guamka railway station (Apsheon district of the Krasnodar Region) on the northern slope of the

Guamsky range (44° 13.453' N, 39° 54.893' E, 400 m A.S.L. on the right bank of the Kurdzhips River) (Fig. 1).

The site was discovered by V.E. Schelinsky in 1975 and excavated in 1985–1989 by the Kuban expedition of the Leningrad branch of the Institute of Archaeology, Academy of Sciences, USSR, now the Institute for the History of Material Culture, St. Petersburg (Trifonov, 1990).

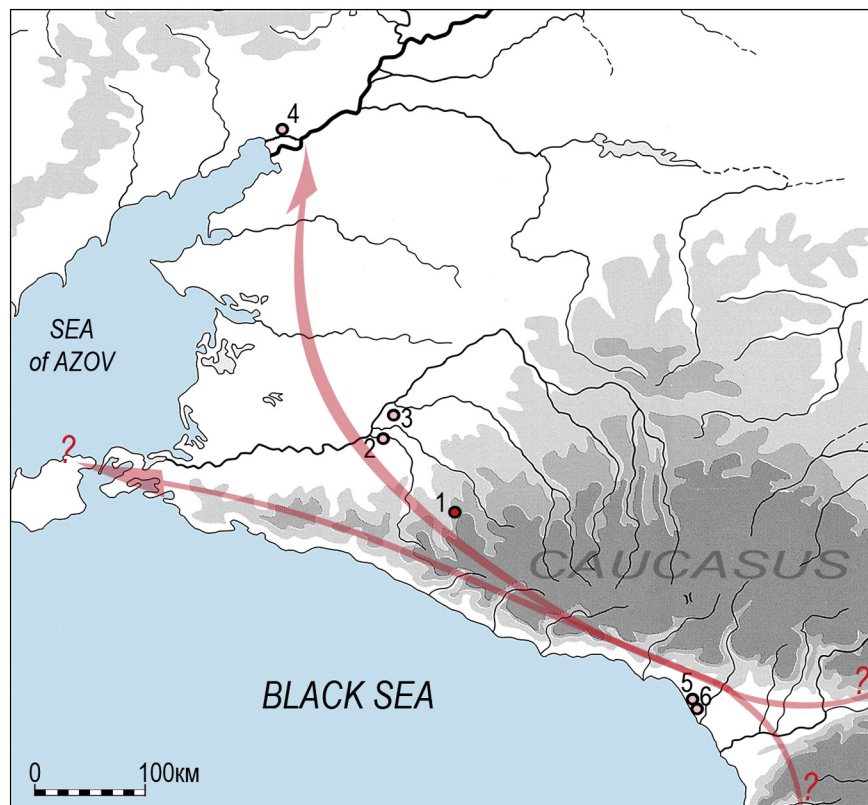
The rockshelter is a natural formation in heterogeneous limestone and is a shell-like alcove of around 700 m<sup>2</sup>, out of which around 200 m<sup>2</sup> have been excavated. The total thickness of the deposits inside the rockshelter varies from five to seven meters. Fourteen main lithological layers have been singled out by color and structure; stratigraphically, they are associated with archaeological materials dating to the Eneolithic Age, the Bronze Age, the Early Iron Age and the medieval period.

All layers are rich in charcoal, ash and bones of wild and domesticated animals.

A concentration of charred millet grains in the form of a caked mass that also contains fragments of burned limestone was identified in fireplace 2, located at the bottom of layer 4/5 near the western wall of the rockshelter in the course of excavations in 1986 (Trifonov, 1987). The fireplace, which is almost two meters in diameter, was made of stones placed along the perimeter of an oval spot of calcined loam. The thickness of the calcined loam was approximately 20 cm.

The thickness of layer 4/5 does not exceed 30 cm. In some sections, the layer is divided into two streaks of loam of different color; where the layer is less than 10 cm thick; there is no distinction in color. The layer is abundant with chipped stone and detritus. Regarding its structure and color, it is substantially different from overlying layer 3B and underlying layer 6A (Fig. 2).

The most typical archaeological material is represented by handmade pottery, including pots with a smooth collar under the rim, burnished bowls, ladles and burnished dishes, ornamented with incised



**Fig. 1.** Map of Western Caucasus and Lower Don area showing locations for sites dated to II-nd mill. BC, where millet (*Panicum miliaceum* L.) was found: 1 – Guamsky Grot, 2 – Chishkho, 3 – Lesnoe, 4 – Safianovo, 5 – Dikha Gudzuba, 6 – Pichori. The red arrows show possible directions of the Millet spread through the Western Caucasus into the Lower Don area and Crimea. (For interpretation of the references to color in this figure legend, the reader is referred to the web version of this article.)

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