



INSTITUTUL DE ARHEOLOGIE „VASILE PÂRVAN”

MATERIALE ȘI CERCETĂRI ARHEOLOGICE

SERIE NOUĂ, SUPPLEMENTUM I

**SCRIPTA PRAEHISTORICA.
MISCELLANEA IN HONOREM
MARIAE BITIRI DICATA**

EDITED BY

ROXANA DOBRESU, ADINA BORONEANȚ, ADRIAN DOBOȘ

EDITURA CETATEA DE SCAUN

2021

COVER: Dan Iulian Mărgărit

**MCA SERIE NOUA
SUPPLEMENTUM I**

www.mcajournal.ro

Descrierea CIP a Bibliotecii Naționale a României

Scripta praehistorica : miscellanea in honorem Mariae Bitiri dicata /

ed. by Roxana Dobrescu, Adina Boroneanț, Adrian Doboș. - Târgoviște :

Cetatea de scaun, 2021

Conține bibliografie

ISBN 978-606-537-545-1

I. Dobrescu, Roxana (ed.)

II. Boroneanț, Adina (ed.)

III. Doboș, Adrian (ed.)

902

**All papers published in *Materiale și Cercetări Arheologice* are peer-reviewed.
Materiale și Cercetări Arheologice is indexed in the following data-bases:
Persée, Copernicus, ERIH PLUS, Scopus, CEEOL, EBSCO and DOAJ.**

This volume was edited with the financial support of the "Vasile Pârvan" Institute of Archaeology in Bucharest.



MARIA BITIRI

CONTENTS/SOMMAIRE

Tabula gratulatoria	5
List of contributors/Liste des contributeurs	9
Maria Bitiri – La Dame du Paléolithique de la Roumanie	13
Maria Bitiri – Photographic retrospective/Retrospective photographique	17
Maria Bitiri – Selected bibliography/Bibliographie sélective	21
Editorial	27
* * *	
Alain TUFFREAU, Les premiers peuplements humains de l'Est des Carpates et de leurs abords dans le contexte européen	29
Vadim STEPANCHUK, Sergii RYZHOV, Yurii VEKLYCH, Oleksandr NAUMENKO, Zhanna MATVIISHYNA, Sergii KARMAZYNENKO, The Lower Palaeolithic assemblage of Medzhibozh 1 layer III (Ukraine) and its palaeoenvironmental context	37
Andrea PICIN, At the onset of the Micoquian in Central Europe: raw material constraints and technological versatility at Neumark-Nord 2/0 (Germany)	71
Maria GUROVA, Stefanka IVANOVA, Mishin Kamik Cave: an unusual Pleistocene site in Northwestern Bulgaria	85
Leonid VISHNYATSKY, Vitalie BURLACU, New research on the Middle Paleolithic of the Middle Prut Basin, Moldova	105
Stanimira TANEVA, On the Middle Paleolithic leaf points from Bulgaria (Southeast Europe)	125
Yuri E. DEMIDENKO, Petr ŠKRDLA, Béla RÁCZ, Adrián NEMERGUT, Sándor BÉRES, The Aurignacian in the Carpathian Basin of Eastern Central Europe and its Proto-Aurignacian industry type	141
Jacopo GENNAI, Set in Stone? Discussing the early Upper Palaeolithic taxonomy using European and Levantine assemblages	183
Paolo BIAGI, Elisabetta STARNINI, The Palaeolithic sequence of the Arma dell'Aquila (Finale Ligure, Savona, North-western Italy)	217
Vasile CHIRICA, Pierre NOIRET, Philip R. NIGST, Valentin-Codrin CHIRICA, Marjolein D. BOSCH, Timothée LIBOIS, Les stations paléolithiques de Mitoc, sur le Prut (Roumanie)	229
Roxana DOBRESCU, Adrian DOBOȘ, Constantin HAITĂ, Ancuța BOBÎNĂ, Bogdan BOBÎNĂ – L'Atelier aurignacien découvert à Bușag (Nord-Ouest de la Roumanie). Données préliminaires	259
Marin CÂRCIUMARU, Elena-Cristina NIȚU, Ovidiu CÎRSTINA, Theodor OBADĂ, Florin-Ionuț LUPU, Marian LEU, Gravettian and Epigravettian personal ornaments in Eastern Carpathians	275

Loredana NIȚĂ, Mircea ANGHELINU, Cristina CORDOȘ, The shouldered points and the Gravettian of the Eastern Carpathian area: insights from Bistricioara-Lutărie III (Ceahlău Basin, Northeastern Romania)	291
Natalya B. AKHMETGALEEVA, Aleksandr E. DUDIN, New art works made of ivory and bone animals from the Upper Palaeolithic site of Kostenki 11 (Russian Plain)	313
Marian COSAC, George MURĂTOREANU, Daniel VERES, Loredana NIȚĂ, Cristoph SCHMIDT, Ulrich HAMBACH, Alexandru RADU, Roxana CUCULICI, Dan Lucian BUZEA, Dan ȘTEFAN, Monica MĂRGĂRIT, Ștefan VASILE, Valentin DUMITRAȘCU, Marius ROBU, Alexandru PETCULESCU, Tiberiu SAVA, Valentin GEORGESCU, Gabriel ȘERBĂNESCU, Ionel GEAMBAȘU, Recent archaeological researches in the Vârghiș Gorges karst area (Eastern Carpathians, Romania). A synthesis of the 2014–2020 campaigns	325
Serghei COVALENCO, Roman CROITOR, Palaeolithic reindeer hunting camps from Cosăuți (Middle Dniester, Moldova)	351
Ștefan VASILE, Valentin DUMITRAȘCU, Zooarchaeological analysis of the faunal remains from the Palaeolithic site of La Adam Cave (Dobrogea, SE Romania) – new data from recent excavations	361
Adrian Balășescu, Valentin Radu, Adina Boroneanț, Clive Bonsall, Mesolithic Icoana revisited (II) – a reappraisal of the faunal remains	373
Dragana ANTONOVIĆ, Vidan DIMIĆ, Ground and abrasive stone tools from the Early Neolithic site of Bataševo (Serbia)	413
Costel ILIE, Florian MIHAIL, The lithic material discovered in the Starčevo-Criș cultural layer from the archaeological site of Negriștești-Curtea Școlii, Galați County	429
Tanya DZHANFENOVA – Exploring the beginnings: a multianalytical archaeometric study of the Early Neolithic pottery production at Koprivets, Northern Bulgaria	445
Erika GÁL, Anna Zsófia BILLER, Éva Ágnes NYERGES, Anett OSZTÁS, Bird remains from the Starčevo and Lengyel culture settlements of the site Alsónyék-Bátaszék (South-western Hungary)	467
Selena VITEZOVIĆ, The Neolithic bone industry from the site of Slatina–Paraćin (excavations of 1962–1985)	487
Cristian Eduard ȘTEFAN, Human bones from Șoimuș- <i>La Avicola (Ferma 2)</i> , Romania, in context	499
Katalin T. BIRÓ, György SZAKMÁNY, Veronika SZILÁGYI, Zoltán KOVÁCS, Zsolt KASZTOVSZKY, Ildikó HARSÁNYI, The first greenstone axe in Hungary	517
Andreea ȚERNA, Elena-Lăcrămioara ISTINA, A first insight into the production of bone, antler and tooth objects at the Copper and Bronze Age site of Fulgeriș – <i>La trei cireși</i>	529
Radu BĂJENARU, The Glina-type flanged axes revisited	553
Vasile DIACONU, Adela KOVACS, Deer antler mace-heads from the Late Bronze Age in Northeastern Romania	569
Monica MĂRGĂRIT, Adrian BĂLĂȘESCU, Adina BORONEANȚ, Reinterpreting an intriguing osseous assemblage from Chitila-Fermă (Bucharest, Romania)	581
Abréviations/ Abbreviations	591

GROUND AND ABRASIVE STONE TOOLS FROM THE EARLY NEOLITHIC SITE OF BATAŠEVO (SERBIA)

Dragana ANTONOVIĆ, Vidan DIMIĆ

Institute of Archaeology, Belgrade, e-mail: d.antonovic@ai.ac.rs, v.dimic@ai.ac.rs

Key words: Ground and abrasive stone tools, Prehistoric technology, recycling, consumption, Early Neolithic, Starčevo culture, Serbia

Abstract: The rescue excavations in Bataševo in central Serbia showed that it was a multi-layer site, on which occupation traces dated from the Early Neolithic, and then from the Bronze Age and the Roman period to the Middle Ages. The most valuable findings and data in the Early Neolithic settlement were provided by the excavations in Makedonska Street, in trenches 2/06, 1/07 and 2/07 where an Early Neolithic layer 1–1.5 m thick was discovered. According to the archaeological material (stone tools, pottery and cult items, objects made of bone, fauna) and dug-in features and houses, it is very certain that during the Early Neolithic period Bataševo was a well-developed settlement, whose inhabitants, aside from husbandry and agriculture, also took part in the production of items made of stone, bone, pottery etc. Ground and abrasive stone tools, according to the choice of the raw materials, manner of making and consumption, repairing and recycling of tools, completely reflects the Early Neolithic technology of production and manner of tool use observed elsewhere in the territory of the Central Balkans. The only remarkable trait is the great fragmentation of the tools, already mentioned, which has been noted so far only at the site of Aria Babi in the Iron Gates, as well as the existence of specialised grindstones for processing stone tools. On the basis of the small area researched so far (35 m²), it is not possible to conclude if there was a specialisation of production of certain groups of artefacts, since no workshop was discovered.

Cuvinte cheie: industrie litică șlefuită, tehnologie preistorică, reciclare, consum, neolitic timpuriu, cultura Starčevo, Serbia

Rezumat: Cercetările arheologice preventive de la Bataševo în centrul Serbiei au indicat prezența unui sit pluri-stratificat, cu urme de locuire pornind din neoliticul timpuriu până în epoca bronzului și apoi din perioada romană până în evul mediu. Cele mai importante descoperiri și informații atribuite neoliticului timpuriu provin din strada Makedonska, secțiunile 2/06, 1/07 și 2/07, unde a fost descoperit un nivel neolitic timpuriu de 1–1,5 m grosime. Materialul arheologic (piese de piatră, ceramică și obiecte de cult realizate din os, precum și resturi faunistice) și complexele și structurile de locuire sugerează că pe durata neoliticului timpuriu Bataševo era o așezare bine dezvoltată ai cărei locuitori se ocupau alături de creșterea animalelor și agricultură, și de producția de obiecte de piatră, os, ceramică etc. Pieseile aparținând industriei pietrei șlefuite, împreună cu materiile prime folosite, modul de producere și de consum, repararea și reciclarea lor, oferă o imagine completă a tehnologiei neolitice timpurii și a modului de utilizare a uneltelor, asemănătoare cu cea observată în alte părți din zona de centru a Balcanilor. Singurele caracteristici remarcabile sunt gradul mare de fragmentare al uneltelor (observat și la Aria Babi, Porțile de Fier) și existența unor piese de piatră specializate pentru producerea uneltelor de piatră. Dată fiind aria relativ mică investigată până acum (35m²) nu putem vorbi despre specializarea producției pentru un anumit tip de piese, întrucât nu a fost descoperit nici un atelier.

INTRODUCTION

Bataševo is located at the periphery of Mladenovac, 58 km south of Belgrade (Fig. 1). The Neolithic site is located on flat terrain, under the Debeljak hill, on the eastern side of the Bataševski Potok stream, which flows into the Veliki Lug River, ca 500 metres from the site. To the north and east from it, there are two spacious loess plateaux, Bataševsko Polje and Veliko Polje. The site was introduced into archaeological registers for the first time in 1986 as a settlement of the Classical period. Archaeological research at this location was conducted by the Belgrade City Museum in 1998, during earthworks performed within the process of setting up the gas pipeline. After that, between 2004 and 2007, archaeological research followed in the area of Makedonska Street, which was intended to be paved with asphalt according to the construction land development program. In both cases, the archaeological research activities had a rescue character, and they were headed by Velibor Katić, curator of the Museum of Mladenovac (part of the Belgrade City Museum). The excavations showed the site to be multi-layered, with occupations dating from the Early Neolithic, and from the Bronze Age and the Roman period all the way to the Middle Ages¹.

The most valuable findings and data on the Early Neolithic settlement at Bataševo were provided by the excavations in Makedonska Street. During the research of trenches 2/06, 1/07 and 2/07, over a surface of 35 m², an Early Neolithic layer was discovered, 1–1.5 m thick. Within this layer, three development phases of the Early Neolithic settlement were distinguished, with several occupation horizons (phases Ia–b, IIa–e, IIIa–b)². The earliest settlement phase on this location includes pit-house no. 1/98 and the remains of calotte-shaped oven no. 1/07, with a platform in front of the entrance. The pit-house, with the diameter of 2.5 m, was dug into yellow loess, and the place where the

¹ Katić 2008a; Katić 2008b; Katić 2010; Marković *et alii* 2018.

² Katić 2008b; Katić 2010.

posthole of the roof construction was dug in, as well as imprints of auxiliary postholes, was noted in the foundation. A small amount of archaeological material was discovered within this feature (pottery fragments, and a bone awl), and a stone hammer was found in the infill (Fig. 11, top). It was on the yellow loess layer that the second phase of the settlement was created as well. Remains of shallowly dug-in features, with fragments of burnt house-wall daub, belong to this phase. No remains of hearths or ovens were found within the features. One of the most interesting units from this second phase is certainly a large feature (12 × 3 m), in use over a longer period of time, and restored on several occasions, judging by the reconstructions of the clay flooring. Remains of ashes were found inside, along with a demolition layer of the wall padding and several fragments of burnt daub in it, with a thick, white and grey coating. The third phase of the settlement consists finds from a layer of dark grey-black earth, 0.3–0.4 m thick. The remains of features from this phase are very poorly preserved and it was not possible to ascertain their full size³.

The inhabitants of the Early Neolithic settlement at Bataševo also left behind a large number of items made of clay, bone, antler and stone. The most numerous ones are fragments of diverse spherical or hemispherical ceramic vessels, whose surface was decorated, in certain cases, in the *impresso* or barbotine technique. The most striking example from this category is certainly a pithos, 48 cm high, with a spherical body and slanting rim, with stripped ornaments, in relief, visible on the outer surface of the belly. The outer and inner sides of the vessel are coated with red. Aside from everyday use items, important finds made of baked clay are represented by altars, and zoomorphic and anthropomorphic figurines⁴. Archaeozoological analyses have shown that the inhabitants of this settlement mostly kept domestic animals, predominantly ovicaprids and cattle, but they were also hunting (deer, roe deer, rabbits and pheasants). On the basis of the age of the animals, it was noted that they were primarily raised for their meat, and then other primary products, such as hide, fat and bones⁵. Bones of domestic and, to a lesser extent, wild animals were used for making tools such as awls/heavy points, cutting tools, scrapers, spatulae, handles, but also decorative items⁶. By chipping stone, sharp blades, scrapers and arrow tips were made. This technique was mostly applied to raw materials such as chert, quartzite and rock crystals, and the finding of one blade made of obsidian bears witness on raw materials being acquired from greater distances⁷. Ground and abrasive stone tools also made up a significant part of the repertoire of tools that were in everyday use in this settlement.

The finds of semi-dug-in and above-the-ground features, pits, ovens and various items made of clay, bone and stone, according to their stylistic traits, techniques and manner of manufacture, are completely in accordance with the Early Neolithic of the Central Balkans and the Starčevo culture (6200–5500 BC)⁸. The only absolute date obtained on an animal bone (Lab. No. BRAMS–2227)⁹ indicates the beginning of the occupation at ca. 6170 BC (6241–6089; 95% CI), which places this site into the group of the earliest settled Early Neolithic settlements in the territory of today's Serbia.

THE GROUND AND ABRASIVE STONE TOOL ASSEMBLAGE FROM BATAŠEVO

The analysis of ground and abrasive stone tools from Bataševo comprised finds discovered during the research seasons in 2006 and 2007 (trenches 2/06, 1/07 and 2/07). Over 2500 (mostly fragmented) stone finds were gathered. Aside from those which were evidently tool fragments, there were also amorphous pieces, which could have been, possibly, parts of ground and abrasive tools, as well as over 1500 pieces of broken stone and pebbles (raw materials: sandstone, lime sandstone, limestone, mica schist, and quartzite) without any traces of processing or use, which were not included in the analysis. The numeric distribution is as follows: 36 mostly fragmented, and several completely preserved ground tools; 239 fragments of abrasive tools with use-wear traces; 255 flakes from production processes; and 453 pieces of raw material, used mostly for the making of ground tools (Table 1).

The largest amount of stone material comes from trench 2/07 (51%), then from trench 2/06 (35%), and the smallest amount comes from trench 1/07 and the profile between trenches (14%). The vertical distribution of the material in all three investigated trenches unequivocally indicates that the second phase of the development of the settlement at Bataševo had the largest amount of stone material (84%). Fifteen percent of the stone material comes from the first phase of the settlement, and only 1% comes from the third phase (Fig. 2).

³ Katić 2010; Marković *et alii* 2018.

⁴ Katić 2010.

⁵ Marković *et alii* 2018.

⁶ Vitezović *et alii* 2020.

⁷ Katić 2010.

⁸ Whittle *et alii* 2002.

⁹ Porčić *et alii* 2020 p. 4.

The analysis of the artefacts consisted of a technological-typological-functional analysis of the artefacts and the petrographic determination of the raw materials that the tools were made of¹⁰. The typological analysis comprised a general observation of the forms of artefacts and the correlation of the morphological or metrical characteristics. All tools which had the minimum of details necessary for a typological determination were categorised according to the typological framework made by D. Antonović¹¹. The function of tools, on the other hand, was determined through a correlation of morphological traits of the artefacts and the visible use-wear traces. In certain cases, it was not possible to clearly define use-wear traces due to patina or other damages on the surface of items. During the analysis of use-wear traces, the *low power approach* was used, which involves the use of a magnifying glass and stereomicroscope, with the enhancement of 10–60x.¹² The analysis of artefacts comprised the unavoidable study of their production technologies as well, which, along with the previously mentioned examinations, enables a broader insight into the operational chain practiced by the inhabitants of the Early Neolithic settlement at Bataševo.

Ground stone tools

Ground stone tools from Bataševo are represented by three typologically recognisable types of cutting edge tools: axes, adzes and chisels. The largest percentage are the fragmented tools and the small, typologically undefined fragments. This category also comprises those ground tools, most probably adzes, which were recycled as hammers (Table 1; Fig. 3).

There are only two examples of axes (Table 1; Fig. 3). They are both fragmented, and the only part of the tools remaining is the distal end, with an arched cutting edge and lateral sides coming closer near the cutting edge. As only a smaller part of these tools was preserved, it was not possible to determine their type more specifically, but it can be assumed that they had a massive appearance. Grey-green alevrolite was used for the making of both axes. The surface of both fragments was completely ground, hence, the traces of previous processing techniques were obliterated. It was not possible to make a detailed analysis of the use-wear traces on the cutting edges because of a layer of patina. What could be noted, even with the patina layer, was that negatives of micro flakes, with rounded edges, could be seen on the cutting edge of both examples, which indicate that both axes continued to be in use even after those micro damages occurred. Also, one of the cutting edges is visibly blunted, which is one of the reasons that could have led to fragmentation during use.

Unlike axes, adzes are more numerous at Bataševo (Table 1, Fig. 3). A large number of these tools was damaged, and only a portion of their proximal part, medial part or cutting edge remained. Only two examples were completely preserved (Fig. 4, a–b). They have smaller dimensions, which, essentially, give them an appearance more similar to tools of the Vinča culture than to those of the Starčevo culture. Eight adzes were typologically determined. Types which occur are III/1, III/2 and III/3¹³. Among the recognised types, the best represented one is type III/1, with 5 examples. This type is represented by relatively flat adzes, with a plano-convex cross-section, with wider distal and narrower proximal ends. All the adzes have an arched cutting edge. The adzes from Bataševo were made from small-grained and fine-grained sedimentary and metamorphic rocks (marl, alevrolite/metaalevrolite and tuff), in nuances ranging from grey to grey-green. In the making of adzes at Bataševo, flaking and grinding technique were used. Flaking was used in order to reduce the raw material/semi-finished product on the dorsal side, with a platform on the ventral side (Fig. 5.) It is interesting to note that, during the processing, there was no tendency to achieve a shape as similar to the final one as possible by using the retouching technique, instead, further reduction of the relatively roughly flaked semi-finished product was achieved through grinding (Fig. 5a). Also, traces of the previous flaking had not been completely annulled by grinding on any of the adzes. On the basis of the two complete specimens, it was indicated that the traces of grinding covered up to 80–90% of their surface. Same as with the axes, the use-wear traces on adzes could not be determined in detail either, due to the presence of patina on the surface of the cutting edge. The only things clearly visible are the negatives of the micro flakes, i.e. the flakes on the dorsal side, with sizes ranging from 1 mm up to 8 mm, as well as the bluntness of the cutting edge. On the proximal part of both adzes, no traces were noted which would indicate that they had been in use over a long period of time. The angle of the cutting edge on

¹⁰ The classification of raw materials used in Bataševo was made by Prof. Vladica Cvetković and Prof. Kristina Šarić, Faculty of Mining and Geology, University of Belgrade, and it consisted of a macroscopic analysis of the entire material and a microscopic examination of 10 samples (Cvetković, Šarić 2013).

¹¹ Antonović 1992; Antonović 2003.

¹² Semenov 1964; Olausson 1990; Olausson 1983; Lunardi 2008; Masclans *et alii* 2017; Dimić 2020; for the abrasive tools: Adams 1988; Adams *et alii* 2009; Hamon 2008.

¹³ Typology according to Antonović 2003, p. 54.

both complete adzes indicates the same thing, since there is no indication of their passing through the cycle of use–damage–sharpening several times.

Chisels are represented by a somewhat smaller number of examples than the adzes (Table 1, Fig. 3). The largest percentage of them are very damaged pieces with only the proximal part preserved, but there are two completely preserved examples registered (Fig. 4 d–e), which, according to their morphological traits, correspond to types V/3b and V/4a¹⁴. The first type of chisels is characterised by the same width of the cutting edge and the proximal end, as well as by parallel lateral sides, while the second type is characterised by a wider distal, and narrower proximal end. Both chisels have an arched cutting edge. The chisels from Bataševo were made from metaalevrolite/alevrolite, tuff, schist and an undetermined magmatic rock. Their production comprised the use of both flaking and grinding, or only grinding, depending on the raw material type (Fig. 4e). Use-wear traces are visible on the cutting edges of both chisels, in the form of negatives of micro flakes / flakes, while grooves can be barely perceived under the layer of patina, which also prevents from defining the shine, if there is any. There are no visible traces of more intense striking on the proximal part of both chisels, therefore, it is possible to conclude that they were placed on some sort of implement or handle. The small dimensions of these tools could also suggest this conclusion, that is to say, their length is merely 40 to 70 mm, which does not allow for a comfortable grip of the chisel.

Aside from the three mentioned types of ground tools, the collection of stone tools from Bataševo also contains eight undefined fragments of ground tools, as well as six partially ground artefacts (most probably adzes), which were recycled, after suffering major damage, and used as hammers or retouching tools. These artefacts were fragmented at the distal end or the medial part, and then used as hammers, as can be seen from the use-wear traces in the form of a group of irregular concave recesses, i.e. the negatives of flakes. Aside from these tools, 12 semi-finished adzes were also registered, a large number of flakes, created as by-products during the making of tools with a cutting edge, as well as a large amount of raw material (Table 1).

Abrasive stone tools

The assemblage of abrasive stone tools found at Bataševo during the excavation seasons in 2006 and 2007 consists of 239 specimens. Out of that total, the largest percentages are the smaller fragments of massive abrasive tools – grindstones and querns (Table 1; Fig. 6). Only several grindstones, whetstones and one handstone have been completely preserved (Fig. 8; Fig. 10).

The most numerous items within abrasive stone tools are the grindstones (Table 1; Fig. 6). Almost all the tools that were sorted into this group were fragmented, with the size of the pieces ranging from 2 cm up to 13 cm. Only one grindstone, used for items made of bone and antler (Fig. 7c), and one small pebble-grindstone, used for polishing ceramics, have been completely preserved. Suitable flat pieces of raw material, with prominent abrasive traits, were most commonly used for the making of grindstones, since they did not require any additional processing. Still, traces of processing on such raw materials were noted on several examples and comprised merely the fine flaking of the edges or lateral sides. The raw materials used for this type of tools are medium- and fine-grained sandstones with a larger content of quartz (50–60%), dacite, tuff, two-mica granite, gneiss and quartz latite. Among these raw materials, the use of sandstone certainly dominates, with 96% specimens (arenite type of sandstone)¹⁵, while other raw materials were represented by one or several items.

Judging by the fragments which have enough details to indicate the type and manner of use, five basic types were singled out (XI/1; XI/3; XI/4; XI/5 and XI/6)¹⁶, with type XI/6 being the best represented one (88 examples), while other types were considerably less represented. This type comprises massive grinding slabs, with one or two clearly defined working surfaces. Among them, a somewhat larger fragment of a specialised grindstone for polishing stone tools with a cutting edge stands out (Fig. 7a). The working surface on it can be clearly seen, on two opposite sides, in the form of an elongated polished recess, created by the long-term grounding of stone tools. When the surface of this grindstone became worn out on one side, the other side was used, up to the moment when successive uses lead to the thinning of the grindstone and heavier damage in the central part of the working surface. This larger fragment of the grindstone was not discarded after being damaged, it was recycled instead and used at the same kind of work, judging by the same use-wear traces on one lateral side. A smaller grindstone (Fig. 7c) is also interesting, with a notable narrow, elongated recess on the working surface, most probably created by polishing items made of bone, antler or wood. All other fragments of these tools have use-wear traces, on one or both sides, in the form of a

¹⁴ Typology according to Antonović 2003, p. 55.

¹⁵ Cvetković, Šarić 2013, samples 78 and 284.

¹⁶ Typology according to Antonović 2003, p. 59.

polished and almost flat working surface. Unfortunately, most of these tools are represented by small fragments, hence, an overview of the appearance of the entire working surface was not possible. Judging by the use-wear traces, they were used mostly for polishing tools from hard and soft raw materials, such as stone, bone, antler and wood. It could be assumed that fragments of these grindstones were used for processing leather as well.

Whetstones were represented by eight examples (3%; Fig. 6), out of which only two were entirely preserved (Fig. 8). These examples are, essentially, very similar to the smaller grinding slabs, although, unlike them, fine-grained raw materials were used for the making of whetstones (fine-grained sandstone, and alevrolite). They are irregular in shape, with one working surface on the upper face. The working surface became very polished and slightly recessed during use. Whetstones are tools that were used for the final sharpening of the cutting edge of stone tools, and the fine sharpening and processing of items made of bone and antler. Both preserved items belong to type XII/2¹⁷.

Querns are, after the grindstones, the most numerous types of tools at Bataševo (Table 1, Fig. 6). Same as grindstones, they are represented exclusively by smaller fragments, up to 11 cm long, hence, it was not possible to establish the number of complete tools (Fig. 9). A high-quality hard magmatic rock was used for querns – quartz latite, and there are also fragments made of two-mica granite¹⁸. Great macroscopic similarities of the raw material (quartz latite) among the fragments suggest that the raw material was most probably exploited from one area only and not from various deposits, also confirmed by microscopic analyses¹⁹. Traces of a working surface on the upper face are clearly visible on the fragments. Processing traces and traces of repair can be seen in the intentional roughening of the polished working surface in order to improve the abrasive properties of the tool. Roughening of the working surface was accomplished by fine flaking, the traces of which, in the form of concave recesses, can be seen on the larger part of the polished surface of querns. There is a possibility that such traces on the working surface were also created during the use of the querns, by pounding, instead of grinding wheat and other grains. On the basis of some fragments with preserved lateral sides, fine flaking of the lateral sides was also noted, in order to give them a more circular shape. Unfortunately, the fragments of querns from Bataševo have small dimensions, and it was not possible to reach conclusions on the type and size of these tools on the basis of their appearance.

A quern represents the static low implement of the two-part apparatus for grinding grains, the second (mobile) part being a handstone. During the investigation of the site, only four handstones were found, out of which three were fragmented, and one, although broken, had all the conjoining parts present (Fig. 10). It was made out of a piece of hard and compact sandstone, with a high percentage of quartz. Magmatic rocks were used for other handstones (three fragments). The preserved handstone had an ellipsoid longitudinal cross-section, with two working surfaces (type XIII/2)²⁰. Along the entire lateral side, traces of primary processing by fine pecking, are visible. Pecking was performed in order to provide an ergonomic shape for the handstone, and so that it would fit better in hand. Judging by the intense use-wear traces, it can be concluded that it was in use for a very long time. The working surfaces are slightly convex and highly polished. Linear traces can be occasionally observed, advancing in the direction of the curving of the working surface, which tells us that the tool was only dragged across the surface of the quern with back-and-forth motions, and not used in circular motions, or for pounding in order to crush grains. On one face of the handstone, which is flat and well-polished, approximately in the middle of the item, there are clearly visible, dense concave recesses, which could indicate that this handstone was used, to the end of its life cycle, as an anvil as well, which could have triggered the heavier damage (Fig. 10, right).

Percussion tools

Percussion tools from Bataševo are represented by four specimens, if we exclude the six specimens of secondarily used ground stone tools mentioned earlier. Out of these four examples, two were entirely preserved (Fig. 11), while two have been broken in half across the middle. For these tools, as a rule, pieces of hard raw materials were used, with ergonomic shape, which usually did not require any primary processing. The examples from Bataševo follow the same rule. Quartzite pebbles were used at three specimens (Fig. 11, top), and one was made from hard metamorphic sandstone (Fig. 11, bottom). Traces of processing on them are not clearly visible, with the exception of a hammer made of sandstone, with a recess for the thumb at the proximal end (on the dorsal face), made in order to enable firmer and better grip. At the distal end of this hammer there are clearly visible striking traces, while such traces on other examples are equally visible at the distal end and the lateral sides. These tools were most probably

¹⁷ Typology according to Antonović 2003, p. 60.

¹⁸ Cvetković, Šarić 2013, samples 66, 80 and 292.

¹⁹ Cvetković, Šarić 2013, p.14.

²⁰ Typology according to Antonović 2003, p. 61.

used for flaking, both in the making of ground stone and flaking stone tools, but also in all the other activities which include striking.

DISCUSSION AND CONCLUDING REMARKS

The collection of ground and abrasive stone tools from the Early Neolithic settlement at Bataševo is not small, but the tools are considerably fragmented and there are only 10 complete specimens. An almost identical image, with a large percentage of very fragmented material, was noted also in the Early Neolithic settlement of Aria Babi in the Iron Gates²¹. There, the cause of the fragmentation of the material was that the very shallow archaeological layer lying on a slope had been cultivated with deep ploughing for decades. Ploughing of the land almost completely destroyed and stretched the layer, and hence, the artefacts as well. On the other hand, in Bataševo, at the locations where the trenches were investigated, different earthworks (construction of the gas pipeline etc.) were carried out. Those works partially led to the devastation of the layer and the archaeological material, however, fragmented material was also registered in other trenches as well, which were not in the zone of the mentioned earthworks. With fragments of stone tools, but also pottery and items made of bone as well, distributed across all layers which define the phases of the settlement at Bataševo (with the accent on phases I and II), we gain the impression that the damaged tools, the flakes from the production process, as well as the smaller pieces of raw materials, had not been deposited in special places (pits, trenches or outside of the occupation area of the settlement), but left within the settlement instead, and covered by a layer of earth, thus also performing the levelling of the terrain. Such successive discarding and covering caused the forming of several archaeological layers which abounded with material. A significant amount of fragmented material was also found in the infill of the various features (pit-houses, access platforms, etc.), identified in these trenches. This, in turn, bears witness on the previously mentioned practice of disposal of the material which was no longer in use. The differences between the stone industry from Bataševo and that from Aria Babi include the existence of semi-finished adzes, then, large amounts of flakes from the process of making these tools, as well as pieces of discarded raw material. The existence of this type of material, along with a large number of fragments of grindstones, among which are those specialised for the manufacturing of cutting edge ground tools with a (Fig. 7a), indicate that the production of stone tools was performed within the settlement. This is especially visible in the second phase of development of the settlement at Bataševo, in which the largest amount of material of this kind was discovered. Unfortunately, research activities have not yielded data which would indicate, unambiguously, the existences of workshops within the investigated trenches.

The study of raw materials indicates that the Early Neolithic craftsmen used different types of rocks in the production of the ground and abrasive tools²². For the ground stone tools (axes, adzes, chisels) fine-grained and metamorphic rocks were used (alevrolite/metaalevrolite, marl, tuff) and occasional pieces of magmatic rocks. The use of alevrolite/metaalevrolite, albite-epidote and epidote schist was dominant. For grindstones, the most commonly used materials were relatively hard flat pieces of sandstone with a higher content of quartz (sandstones of the arenite type), and considerably less often – dacite, tuff, gneiss and two-mica granite. The uniformity of the raw material is also shown at querns, for which the most commonly used material was a very hard magmatic rock – quartz latite. According to its petrographic traits, this rock is almost identical to the quartz latites from the volcanic areas of Šumadija, e.g. from the quarry of Kruševica near Lazarevac, or some near-by outcrop which belongs to the lower Miocene volcanic rocks of Šumadija, first and foremost from the area of Rudnik. This is indicated not only by the petrographic traits, but especially so by genetic similarities with lower Miocene volcanic rocks²³. Hence, we may assume that the craftsmen from Bataševo were exploiting raw materials from deposits located at a relatively small distance from the settlement, such as Kosmaj and Bukulja, but also from somewhat more distant areas such as Kruševica, and possibly even Rudnik (Fig. 1). The possibility should also be considered that raw materials, but tools as well, could have been partially obtained through exchange, as indicated by an obsidian blade discovered at the site.²⁴

The making of cutting edge ground stone tools at Bataševo was performed in two manners, both typical for the Neolithic of the Central Balkans. The first was by flaking pieces of fine-grained rock (alevrolite/metaalevrolite, marl, tuff and schist) until a semi-finished form was reached, which would then be processed with the grinding technique until the final product was achieved. This method can best be seen in the making of adzes and chisels and it indicates a completely developed technology for manufacturing ground stone tools. The second method consisted of

²¹ Antonović *et alii* 2017.

²² Cvetković, Šarić 2013.

²³ Cvetković, Šarić 2013, p. 15.

²⁴ Katić 2010, p. 24.

taking suitable pieces of raw material that morphologically already reminded of a given tool (axes and chisels) and processing them merely by grinding. It is interesting to note that at the tools that were formed by flaking, the final forming of the semi-finished products and the cutting edges was not performed by retouching. The semi-finished product would be roughly shaped only by flaking, and the further reduction of the raw material would then be performed by grinding. Such technological procedure would considerably lengthen the time needed to make a tool, but it would considerably lessen the possibility of a semi-finished product getting fragmented during processing. On the basis of several completely preserved examples of cutting edge tools from Bataševo, it was observed that 80–90% of the surface of the items was grinded, which is completely consistent with the Early Neolithic technologies (well-ground and polished tools). The grinding of the items was performed on grinding slabs made of sandstone, and then on whetstones as well. A fragment of a specialised grindstone for manufacturing stone cutting edge tools was found at Bataševo also, and, for the time being, this is the first find of this type at Early Neolithic sites (Fig. 7a). Such grindstones are more numerous at the Vinča culture sites, as confirmed by a very similar example from Pločnik as well²⁵.

Unlike ground tools, abrasive tools usually didn't require any special processing, because flat pieces of raw materials with abrasive properties were most commonly used. The only changes on them were performed by pecking or flaking of lateral sides in order to blunt the sharp edges, round the sides and thus obtain a shape suitable for use. Such processing of edges and lateral sides was noted mostly in large grinding slabs, querns and handstones. On the other hand, traces of repairs were noted on working surfaces of querns, which were performed by pecking in order to make the working surface rough again, after it became polished through use.

The repertoire of ground and abrasive stone tools from Bataševo is relatively diverse (Table 1). Tools of all types are present, therefore, Bataševo does not differ from other Early Neolithic sites, especially since there are no exceptional examples of tools. The only remarkable trait is the great fragmentation of the tools, already mentioned, which has been noted so far only at the site of Aria Babi in the Iron Gates²⁶, as well as the existence of specialised grindstones for processing stone tools. Abrasive tools were more present in terms of percentage than ground stone tools, in all phases of the settlement (Fig. 2), however, since those were mostly fragments, we cannot determine the number of complete tools. The repertoire of typologically defined tools (axes, adzes, chisels, hammers, different types of grindstones and whetstones) indicate that ground stone tools, but also items made of bone, had been made in Bataševo²⁷. Axes, adzes and chisels were used exclusively in woodworking activities, as indicated by the partially visible use-wear traces on their cutting edges. The use of these tools in more difficult woodworking activities could have been the cause of a larger number of damaged tools. On the other hand, the existence of damaged ground tools with visible traces of pounding, subsequently formed, which can be noted at one or both ends, suggests that secondary use of ground tools as hammers was also practiced at Bataševo. Identical examples of secondary use of tools with a cutting edge were noted at other Early Neolithic sites in Serbia as well (Donja Branjevina and Grivac)²⁸. Quern fragments are also numerous, but in this case as well it is not possible to determine the number of complete tools. In any case, the identification of fragments of working surfaces of querns and several pounders indicates, in a way, the manner of use of these tools for grinding wheat and crushing nuts and grains.

Ground and abrasive stone tools from Bataševo, according to the choice of raw materials, the manner of manufacturing and using them, as well as the data on the repairs and recycling of tools, wholly reflect the Early Neolithic technology of production and the manner of using this type of tools in the Central Balkans. It should be pointed out that the manner of making tools (flaking + grinding), as well as the amount of flakes discovered in all layers of phases I and II of the settlement, indicate a completely developed production technology for these tools, and that tools made of pebbles were present in smaller amounts. Observing the archaeological material from this site as a whole (stone tools, pottery and cult items, objects made of bone, and fauna), as well as the types of dug-in features and houses which occur in phases I and II, it is very certain that, during the Early Neolithic period, Bataševo was a well-developed settlement, whose inhabitants, aside from husbandry and agriculture, also took part in the production of items made of stone, bone, ceramic and probably organic raw materials such as wood, which have not been preserved in the archaeological layers investigated. On the basis of the research activities conducted so far, we do not know if there was a specialised production of certain groups of artefacts, since no workshop was discovered. We should point out that only a small part of the settlement has been investigated so far, and that future excavations should bring more data on the Early Neolithic production and use of ground and abrasive tools.

²⁵ Dimić 2020, p. 52; Antonović, Dimić in preparation.

²⁶ Antonović *et alii* 2017.

²⁷ Vitezović *et alii* 2020.

²⁸ Antonović 2005; Antonović 2008.

ACKNOWLEDGEMENTS

We would like to express our gratitude to Velibor Katić, curator at the Belgrade City Museum, who enabled us to analyse the collection of ground and abrasive stone tools, and provided us with all the necessary information about the rescue excavation in Bataševo. Our research was financially supported by the City Municipality of Mladenovac and the Belgrade City Museum.

REFERENCES

- Adams 1988 – J. L. Adams, *Use-wear analyses on manos and hide-processing stones*, JFA 15, 1988, 3, p. 307–315.
- Adams *et alii* 2009 – J. Adams, S. Delgado, L. Dubreuil, C. Hamon, H. Plisson, R. Risch, *Functional analysis of macro-lithic artefacts: a focus on working surfaces*, in: F. Sternke, L. Eigeland, L. J. Costa (eds.), *Non-Flint Raw Material Use in Prehistory – Old prejudices and new directions*, BARIntSer 1939, Oxford, 2009, p. 43–66.
- Antonović 1992 – D. Antonović, *Predmeti od glačanog kamena iz Vinče*, Centar za arheološka istraživanja 10, Beograd, 1992.
- Antonović 2003 – D. Antonović, *Neolitska industrija glačanog kamena u Srbiji*, Posebna izdanja 37, Beograd, 2003.
- Antonović 2005 – D. Antonović, *The Polished stone assemblage*, in: S. Karmanski (ed. by P. Biagi), *Donja Branjevina: a Neolithic settlement near Deronje in the Vojvodina (Serbia)*, Societa per la preistoria e protostoria della regione Friuli-Venezia Giulia, Quaderno 10, Trieste, 2005, p. 49–57.
- Antonović 2008 – D. Antonović, *Ground stone artifacts*, in: M. Bogdanović (ed.), *Grivac: settlements of Proto-Starčevo and Vinča culture*, Kragujevac, 2008, p. 411–432.
- Antonović *et alii* 2017 – D. Antonović, V. Dimić, A. Starović, D. Borić, *Ground Stone Artefacts from Aria Babi*, in: M. Mărgărit, A. Boroneanț (eds.), *From Hunter-Gatherers to Farmers: Human adaptations at the end of the Pleistocene and the first part of the Holocene: Papers in honour of Clive Bonsall*, Târgoviște, 2017, p. 135–147.
- Antonović, Dimić, in preparation – D. Antonović, V. Dimić, *Abrasive stone tools in Neolithic of Serbia: from recognizing to publication*, in: A. Baysal (ed.), *The Lithics from Anatolia and Beyond*, Oxford.
- Cvetković, Šarić 2013 – V. Cvetković, K. Šarić, *Petrografska analiza uzoraka glačanih alatki sa lokaliteta Bataševo*, Documentation of Belgrade City Museum.
- Dimić 2020 – V. Dimić, *Manufacture and use of neolithic ground stone tools with a cutting edge, experimental research and comparative traceological analyses*, PhD dissertation, University of Belgrade, Faculty of Philosophy, 2020.
- Hamon 2008 – C. Hamon, *Functional analysis of stone grinding and polishing tools from the earliest Neolithic of north-western Europe*, JAS 35(6), 2008, p. 1502–1520.
- Katić 2008a – V. Katić, *Zaštitna arheološka iskopavanja na lokalitetu Bataševo u Mladenovcu 2004. i 2005. godine*, Arheološki pregled NS 2/3 (2004/5), 2008, p. 9–10.
- Katić 2008b – V. Katić, *Zaštitna arheološka iskopavanja na lokalitetu Bataševo u Mladenovcu*, Arheološki pregled NS 4 (2006), 2008, p. 28 – 30.
- Katić 2010 – V. Katić, *Bataševo, naselje iz starijeg neolita*, Katalog izložbe 57, Muzej grada Beograda, Beograd.
- Lunardi 2008 – A. Lunardi, *Experimental testing with polished green stone axes and adzes: technology of use*, in: L. Longo, N. Skakun (eds.), *Prehistoric Technology 40 Years Later: Functional Studies and the Russian Legacy*, BARIntSer 1783, Oxford, p. 369–373.
- Marković *et alii* 2018 – N. Marković, J. Bulatović, J. Jovanović, V. Katić, *Bioarheološka perspektiva ranoneolitskog nalazišta Bataševo*, in: I. Todorović, G. Jašović, I. Becić, Lj. Vasiljević (eds.), *Juhorski zapisi*, Svojnovo, Kruševac, p. 29–38.
- Masclans Latorre *et alii* 2017 – A. Masclans Latorre, A. Palomo, J. F. Gibaja Bao, *Functional studies of Neolithic stone axes and adzes: experimental program and archaeological applications (Estudios funcionales de hachas y azuelas de piedra neolíticas: programa experimental y aplicaciones metodológicas)*, CPAG 2, 2017, p. 177–210.
- Olausson 1983 – D. Olausson, *Flint and groundstone axes in the Scanian Neolithic. An evaluation of raw materials based on experiment*, CWK Gleerup, 1983.
- Olausson 1990 – D. Olausson, *Edge-wear analysis in Archaeology. The current state of research*, Laborativ arkeologi 4, 1990, p. 5–14.
- Porčić *et alii* 2020 – M. Porčić, T. Blagojević, J. Pendić, S. Stefanović, *The timing and tempo of the Neolithic expansion across the Central Balkans in the light of the new radiocarbon evidence*, JAS: Reports 33, 2020, 102528, p. 1–12.
- Semenov 1964 – S. A. Semenov, *Prehistoric Technology: an Experimental Study of the Oldest Tools and Artefacts from Traces of Manufacture and Wear*, London, 1964.
- Vitezović *et alii* 2020 – S. Vitezović, N. Marković, V. Katić, *Bone technology from the Early Neolithic site of Bataševo (Serbia)*, in: N. Marković, J. Bulatović (eds.), *Animal Husbandry and Hunting in the Central and Western Balkans Through Time*, Oxford, 2020, p. 10–18.
- Whittle *et alii* 2002 – A. Whittle, L. Bartosiewicz, D. Borić, P. Pettitt, M. Richards, *In the beginning: new radiocarbon dates for the Early Neolithic in northern Serbia and south-east Hungary*, Antaeus 25, 2002, p. 63–117.



Figure 1. Location of the Early Neolithic settlement at Bataševo and the sites mentioned in the text.

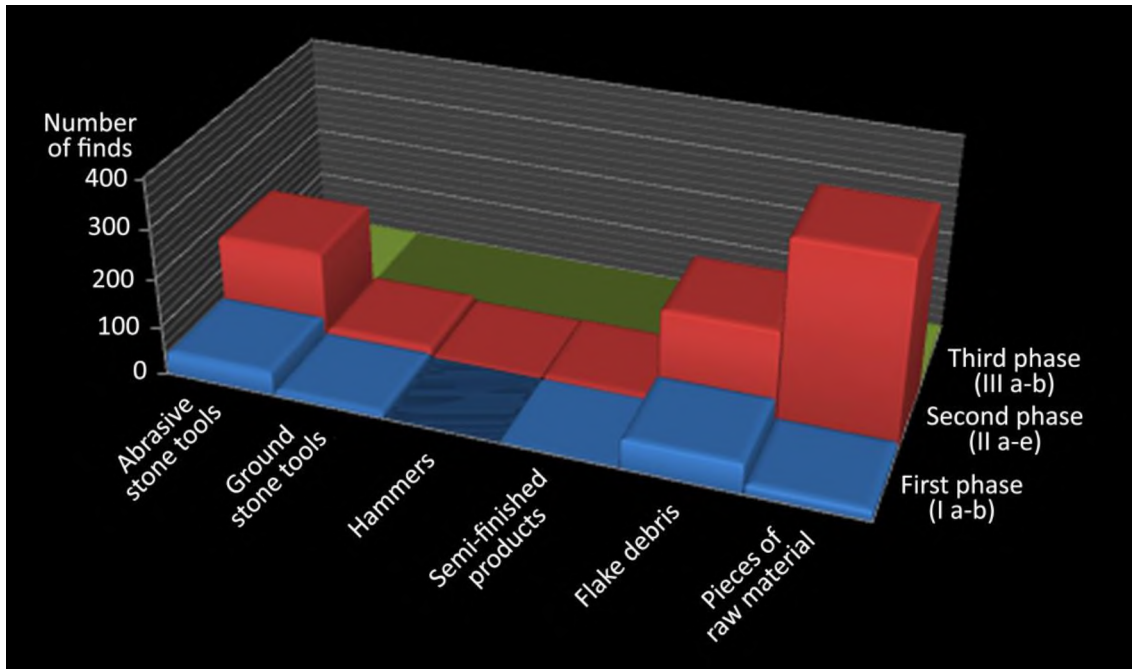


Figure 2. Numerical distribution of the stone material within the three development phases at Bataševo.

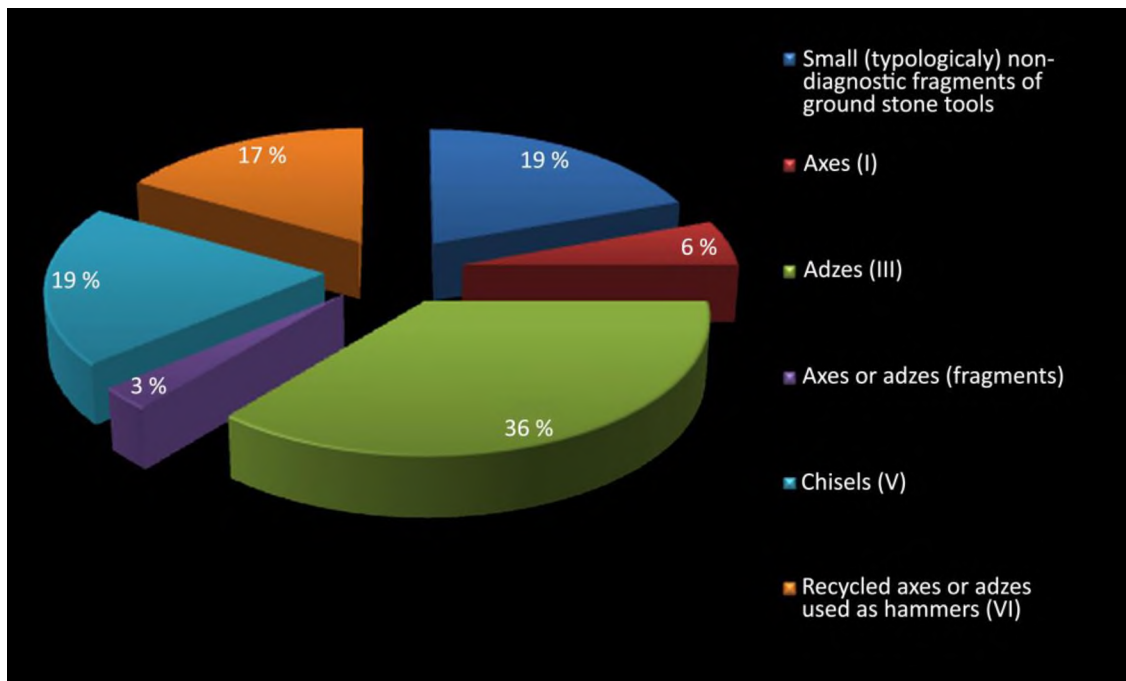


Figure 3. Distribution of different types of ground stone tools at Bataševo.

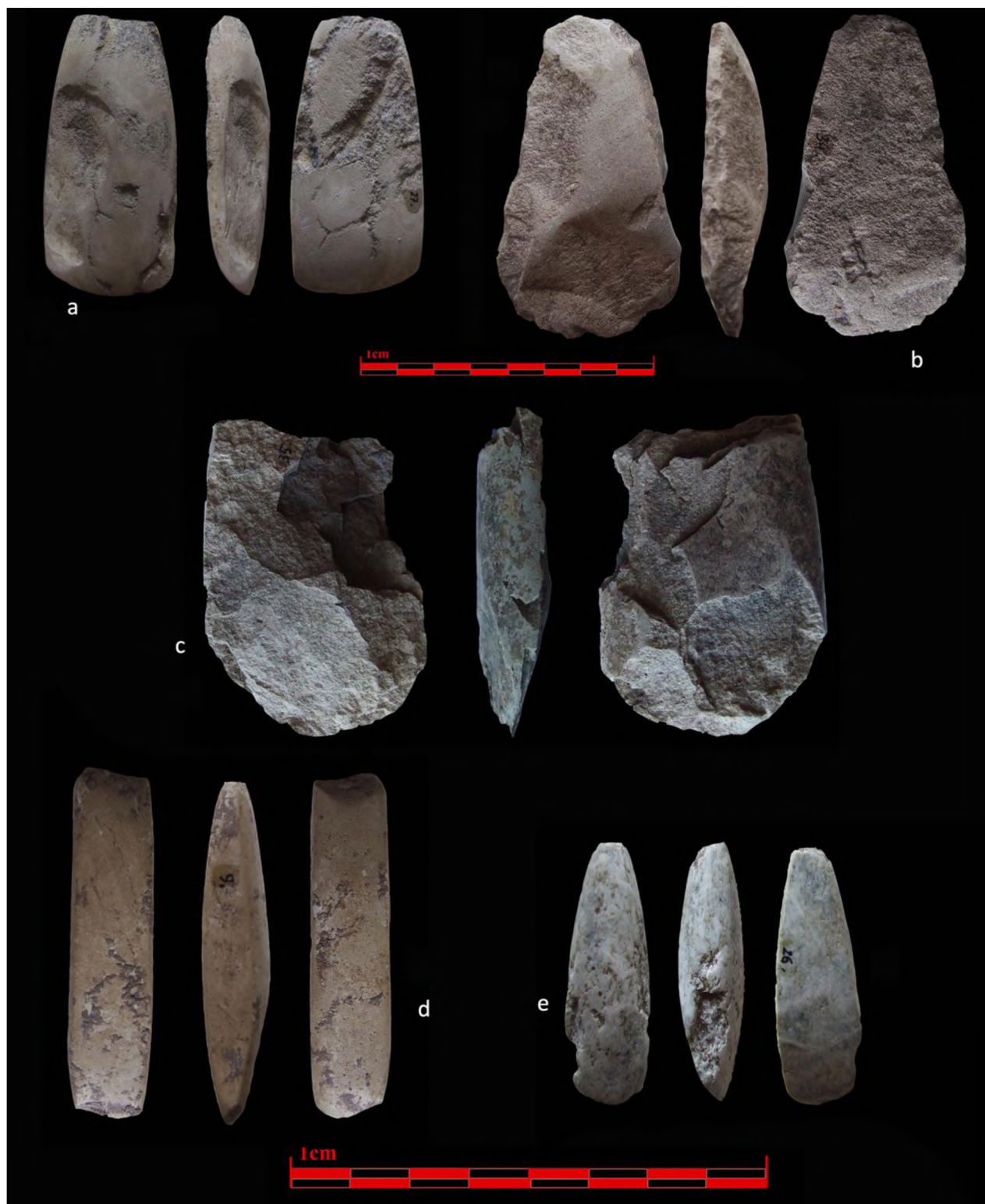


Figure 4. Adzes and chisels from the Early Neolithic settlement at Bataševo; a. adze type III/1a; b. adze type III/2a; c. fragmented adze; d. chisel type V/3b; e. chisel type V/4a.

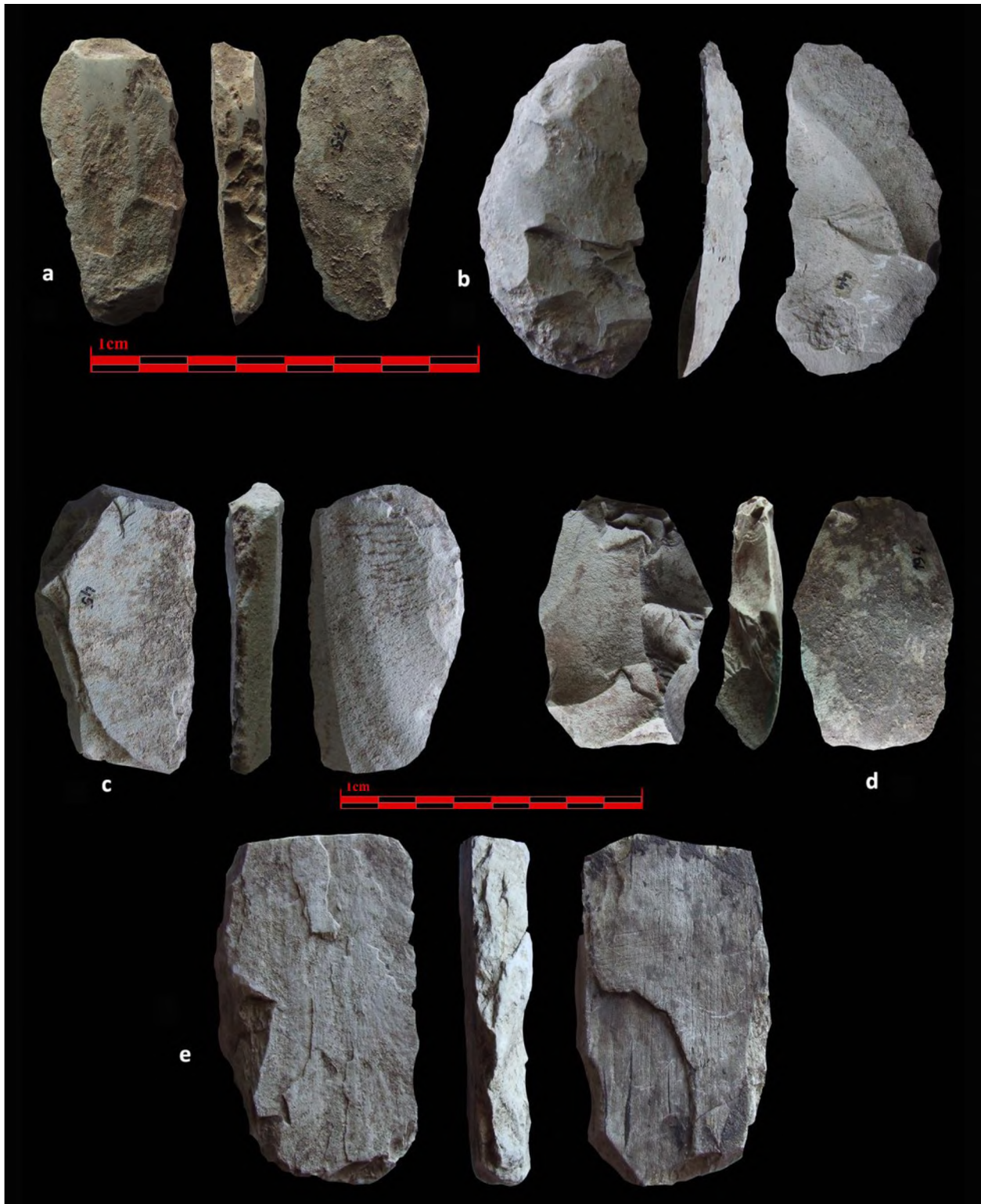


Figure 5. Semi-finished adzes from Bataševo.

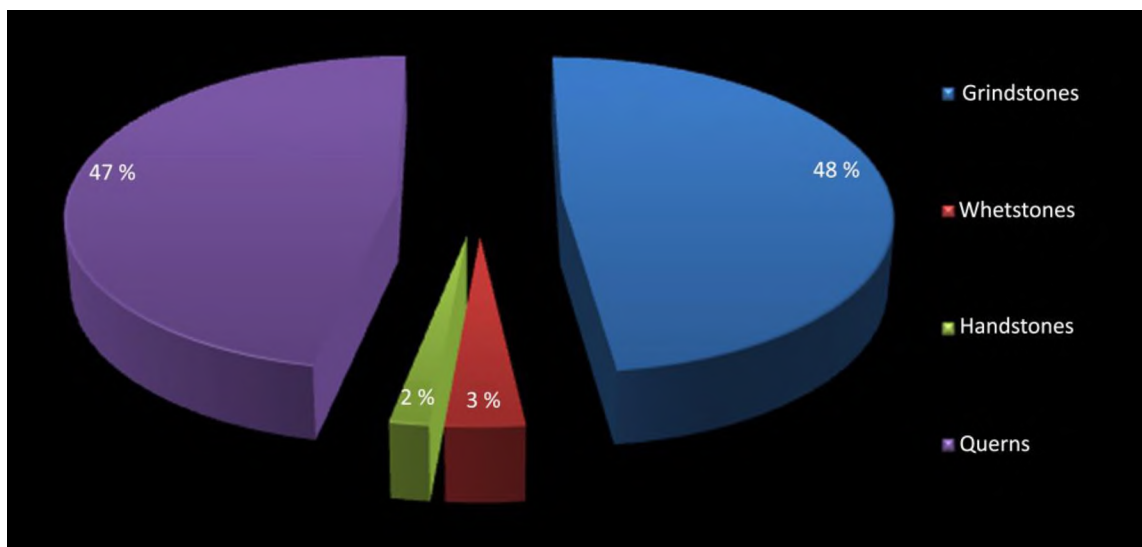


Figure 6. Distribution of diferent types of abrasive stone tools from Bataševo.

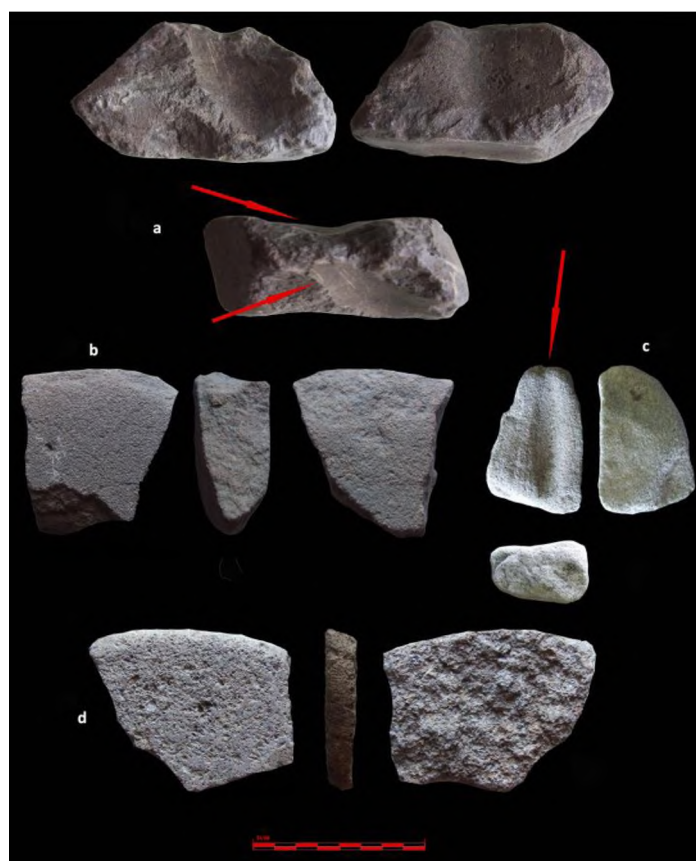


Figure 7. Fragments of diferent grinding stones from Bataševo: a. grinding slab type XI/6b; b. and d. grindig slab type XI/6d; c. grindstone for bone and antler tools type XI/4; d. grindig slab type XI/6.



Figure 8. Whetstones from Bataševo – type XII/2 .

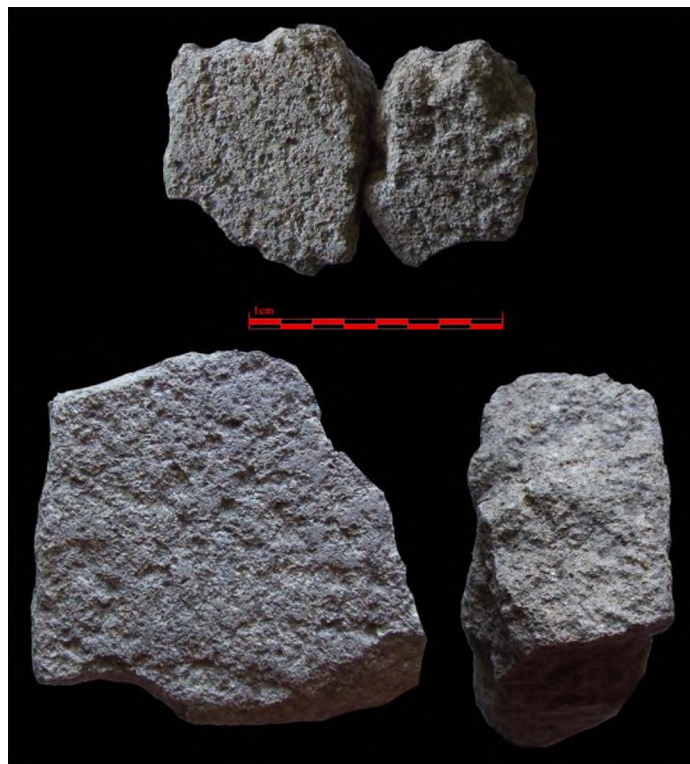


Figure 9. Fragments of querns from Bataševo.



Figure 10. Handstone with two working surfaces from Bataševo.



Figure 11. Hammers from Bataševo.

TABLES

Type of tool	Numerical and percentage distribution	Complete tools	Raw material
Small (typologically) non-diagnostic fragments of ground stone tools	7 (2%)		Fine-grained sedimentary and metamorphic rocks (metaalevrolite, marl and tuff)
Axes (I)	2 (1%)	0	Fine-grained sedimentary rocks (alevrolite)
Adzes (III)	13 (5%)	2	Fine-grained sedimentary and metamorphic rocks (metaalevrolite/alevrolite, marl and tuff)
Axes or adzes (fragment) (I or III)	1 (0.5%)		Alevrolite
Chisels (V)	7 (2%)	2	Fine-grained sedimentary and metamorphic rocks (metaalevrolite/alevrolite, tuff and schist)
Recycled axes or adzes (I or III) used as hammers (VI)	6 (2%)	0	Fine-grained sedimentary and metamorphic rocks (metaalevrolite/alevrolite)
Hammers (VI)	4 (1%)	1	Quartzite, sandstone
Grindstones (XI)	115 (40%)	2	Fine and medium-grained quartz sandstone, dacite, tuff, gneiss and quartz latite
Whetstones (XII)	8 (3%)	2	Fine-grained sandstone, gneiss and alevrolite
Handstones (XIII)	4 (0.5%)	1	Magmatic rocks, silicate-sandstone
Querns (XIV)	112 (39%)	0	Quartzlatite and two-mica granite
Semi-finished products	12 (4%)	5	Metaalevrolite and schist
TOTAL	291		
Pieces of raw material	+ 453		Fine-grained sedimentary and metamorphic rocks (alevrolite/metaalevrolite, marl, albite-epidote schist, sandstone, tuff, chert, cornite and quartz latite)
Flake debris from production of ground stone tools	+ 255		Fine-grained sedimentary and metamorphic rocks (alevrolite/metaalevrolite, marl, albite-epidote schist and epidote schist)

Table 1. Percentage distribution of various types of artefacts from Bataševo.