

THE CHIPPED STONE ASSEMBLAGE FROM THE EARLY CHALCOLITHIC SETTLEMENT AT ISAIIA – BALTA POPII

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Abstract: The paper presents, in detail, the investigations on the chipped stone assemblage discovered, during archaeological excavations, in the early Chalcolithic settlement at Isaiia - Balta Popii. The technological and typological analysis of the entire collection was accomplished taking into account the various raw materials that are its constituents. In the case of the raw material with the greatest frequency – the flint from the Moldavian Platform –, artefacts coming from all phases of the debitage are certified. The results obtained for Isaiia were then compared with those from other Precucuteni II - Tripolje A sites, highlighting the existence of technological and typological elements common for the lithic industries of the early Chalcolithic in Eastern Europe (North-East of Romania, Republic of Moldova and Ukraine).

Cuvinte-cheie: Eneolitic timpuriu, tehnologie litică, tipologie litică

Rezumat: Lucrarea prezintă, pe larg, investigațiile asupra utilajului litic cioplit descoperit în timpul săpăturilor arheologice din așezarea eneoliticului timpuriu de la Isaiia – Balta Popii. Analiza tehnologică și tipologică a întregii colecții de piatră cioplită a fost realizată ținând cont de diversele materii prime care o alcătuiesc. În cazul materiei prime cu cea mai mare frecvență – silixul din Platforma Moldovenească –, sunt atestate artefacte provenind din toate etapele debitajului. Compararea rezultatelor obținute pentru Isaiia cu cele din alte situri Precucuteni II-Tripolie A, evidențiază existența unor elemente de tehnologie și tipologie comune industriilor litice de la începutul eneoliticului în spațiul est european (regiunea de nord-est a României, Republica Moldova și Ucraina).

INTRODUCTION

The emergence and spread of the Precucuteni-Trypilia A communities at the half of the fifth millennia B.C. is considered as the beginning of the Chalcolithic in nowadays north-eastern part of Romania, Republic of Moldavia and Ukraine. These human communities possessed a range of shared elements in their material culture and spiritual background, as similar habitat preferences, the overall use of incisions in decorating pottery, the same patterns in realising the anthropomorphic statuettes etc. The legitimate question is whether their lithic technology can be registered in the common cultural background or is a phenomenon that gained its own characteristics depending on various agents. Answering this question, at the moment, proves to be difficult since the published data, at least for the western settlements of the Precucuteni-Tripolje A (the area bordered by the Carpathian Mountains and the Prut River) are scarce and unequal in presenting the technological and typological features of the chipped stone collections¹. The only exception is the analysis of the

industry at Traian – Dealul Viei². These deficiencies are an impediment for an overall diachronic view, in an attempt to ascertain the main features of the lithic industry at the dawns of the Chalcolithic in the given geographical space. Additional to the impossibility of establishing the characteristics of the technology is also the lack of a coherent typological list for the categories of retouched products. Thus, we state the necessity of reconsidering the assemblages already published and also of analysing the newly discovered ones. Since the geographical space that we are referring to was not culturally isolated in the fifth millennia B.C., but was a part of the Precucuteni-Tripolje A area, it is essential to understand the lithic technology and typology in a broader cultural context. Thus, comparing the chipped stone inventories discovered in the Precucuteni-Tripolje A settlements from nowadays Romania, Republic of Moldavia and Ukraine is necessary in order to understand their shared attributes. Fortunately, data available, at the moment, for the settlements from the left of the Prut River are more concise and more focused in understanding the prehistoric technology.

¹ Păunescu 1970; Boghian 1995; 1996; Boghian, Tudose 1994; Marinescu-Bîlcu 1974; 1981; Țurcanu 2006; 2009; Vulpe 1957, p. 242–248.

² Țurcanu 2006; 2009.

MATERIALS AND METHODS

An assemblage that can offer a good perspective on the organisation of the lithic technology in the Early Chalcolithic is the one coming from the Isaiia - *Balta Popii* settlement (Răducăneni commune, Iași county). The site is located in the north-eastern part of Romania (Fig. 1), at the intersection of the Moldavian Plain and the Bârlad Plateau, on a fragment of terrace, close to the confluence of Jijia and Prut Rivers³. It was discovered in 1992 by V. Merlan, the first archaeological surveys being undertaken in 1996, by N. Ursulescu ("Alexandru Ioan Cuza" University in Iași). The

research was resumed, in a systematic manner, on several occasions, in 1998, 2000–2005, 2007–2010 and 2015, by N. Ursulescu, F.-A. Tencariu and others⁴. Isaiia – *Balta Popii* has a complex stratigraphy⁵, the most consistent archaeological deposits belonging to the Early Chalcolithic Precucuteni culture, with three layers of habitation (IIA, IIB, III⁶). From these particular layers 11 dwellings and more than 50 pits were excavated. Two absolute chronology data obtained for the IIB layer indicate that the middle sequence of habitation occurred sometime around 5680 ± 40 B.P. ($4618-4446$ cal B.C.) / 5660 ± 40 BP ($4592-4438$ cal B.C.) (see Table 1, Fig. 2).

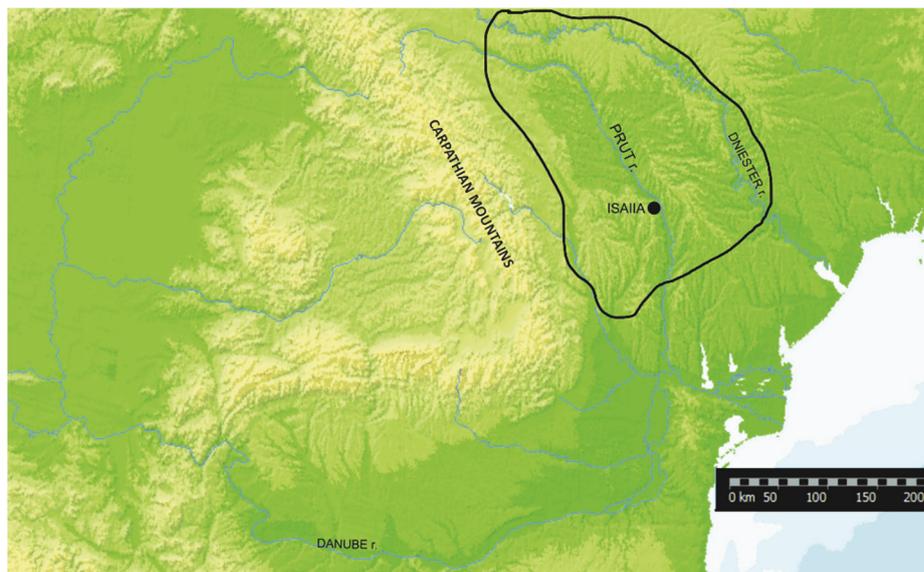


Figure 1. The location of Isaiia – Balta Popii site in the area of Precucuteni II – Tripolje A culture (map support Microsoft Encarta).

No of sample	Layer	Archaeological feature	Laboratory no.	Material	BP	Cal B.C.
ISA 1	IIB	Stone structure	Poz-84452	animal bone	5680 ± 40	4618 – 4446
ISA 2	IIB	Dwelling 14	Poz-84453	animal bone	5660 ± 40	4592 – 4438

Table 1. Isaiia – Balta Popii. Absolute chronology data obtained for the Early Chalcolithic IIB layer.

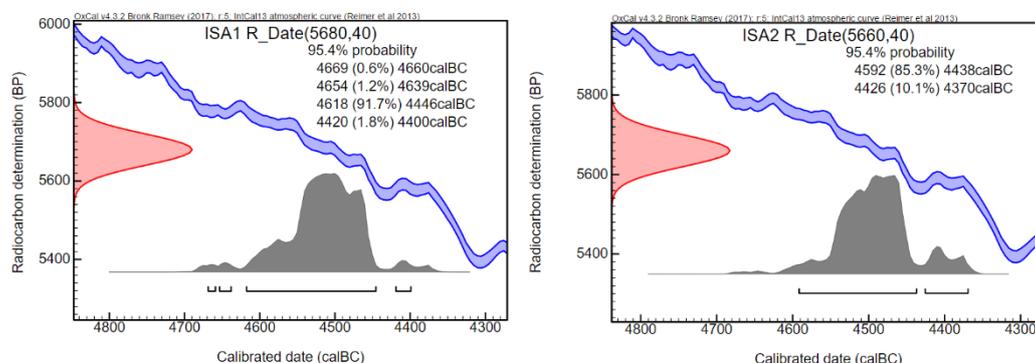


Figure 2. Graphics containing the calibration of the two radiocarbon dates from Isaiia – Balta Popii in OxCal v4.2.

³ Ursulescu, Tencariu 2006, p. 11.

⁴ Bolohan *et alii* 2016; Ursulescu *et alii* 2001; 2002; 2003; 2004; 2005; 2006; 2008; 2009; 2010; 2011.

⁵ Ursulescu, Tencariu 2006, p. 25.

⁶ The layer I from *Balta Popii* is represented by the Neolithic Linearbandkeramik culture, while the newer ones (IV–VI) are characterized by the presence of various Bronze Age, Early Iron Age, Early Medieval materials and archaeological features. A Sarmatic necropolis was also investigated at the site.

The chipped stone collection discovered during the 1996–2015 excavations comprises more than 2000 items, coming from all Prehistoric layers. Since dealing with a multi-layered site the first step in the analysis was to differentiate, on a stratigraphic base, the assemblage that could be attributed to the Early Chalcolithic settlement⁷. The distribution of the 989 artefacts that were discovered in the Precucuteni settlement is quite balanced (Table 2), exponentially decreasing with the number of the archaeological features from each layer.

TECHNOLOGICAL CATEGORY	Layer IIA	Layer IIB	Layer III	TOTAL
Cores	6	4	10	20
Unretouched products	144	149	117	410
(Flakes)	(93)	(91)	(77)	(261)
(Blades)	(51)	(58)	(40)	(149)
Retouched items	108	84	76	268
Flint nodules	3	1	1	5
Shatters & waste	90	98	89	277
Flint hammers	3	4	2	9
TOTAL	354	340	295	989

Table 2. Isaiia – Balta Popii. The distribution in the Precucuteni layers of the lithic assemblage discovered during the 1996–2015 excavations.

The lithic inventory was recorded according to the following technological categories: (1) cores, (2) primary products (a. flakes, b. blades), (3) retouched products (Table 2). Additionally, there were also registered the (4) flint nodules without human intervention (5) shatters & waste and the (6) hard hammers used for flintknapping.

The typological list of the retouched products comprises only the artefacts that had their morphology transformed through intentional retouching, excluding the ones that had their morphology changed through use. As a consequence, the typological list for Isaiia, contrary to the Romanian practice⁸, does not include any references to the so-called *a posteriori* tools⁹ or to the sickle inserts (blades with *sickle gloss*).

RAW MATERIALS

The raw materials of the chipped stone items were macroscopically determined¹⁰, being separated in two main groups: flint (A) and other materials (B). Depending on the visual characteristics (colour, appearance, pattern and cortex¹¹), the groups were subdivided in several classes:

- **A₁**: flint of colours ranging from black to grey, white-grey, with white spots, translucent, fine grained, with thick chalky cortex (Pl. I/1–6). This material formed in the chalky marls constituting the Cretaceous deposits as part of the sedimentary cover for the Moldavian Platform¹². The deposits cropped out, due to erosion, on both sides of the Prut River¹³, in Pleistocene¹⁴, being thus available for the Prehistoric human communities. The outcrops can be found on the right side of the Prut between the nowadays localities of Miorcani and Mitoc¹⁵ and on the left side of the same river between the localities Lipcani and Bădrăgi¹⁶. The amount of A₁ raw material is high at *Balta Popii* (70% of the assemblage) (see Fig. 3), being present in all technological categories. Also, it must be added the fact that a preponderance of the greyish variety of this flint was observed;

- **A₂**: a very fine grained flint, translucent, transparent when transformed in thin blades, of a grey-chocolate colour, with a shiny texture (Pl. I/7–9). Its cortex is very thin and different when compared to the cortex from the A₁ class. The A₂ class is represented only by already knapped products, mainly blades with straight and parallel edges, of high technological skill, endscrapers and trapezes. At the moment, it is impossible to speak of its provenance¹⁷;

- **A₃**: a fine grained, smoky black, translucent flint, with white sub-translucent /opaque bands (Pl. I/10), similar to what is recorded in the archaeological literature as Volhynian flint¹⁸. Only an endscraper and a medial blade fragment (of unusual large dimensions for the Isaiia lithic inventory) were made of this raw material;

⁷ A small part of the assemblage from Isaiia - *Balta Popii* was published by V. Merlan (2005) but his exposure of the collection is rather dilettante, lacking any real information on the lithic technology and typology, having no separation of the archaeological contexts from the site.

⁸ Păunescu 1970; Țurcanu 2009.

⁹ Bordes 1970, p. 200.

¹⁰ Petrographic analysis for determining the raw materials for some of the artefacts from Isaiia were made in 2010–2011 by O. Crandell (Babeş-Bolyai University in Cluj), the results being included in the PhD thesis of Vornicu (2012a) and Crandell (2014). For this paper is presented a macroscopic determination since not all the categories of raw materials were analysed.

¹¹ Crandell 2006.

¹² On their formation during the Cretaceous and redeposit in the subsequent geological era see: Albu *et alii* 1959; Băgu, Mocanu 1984,

p. 18–25; Ionesi 1989, p. 17–20; Muraru 1990; Mutihac 1990; Văleanu 2015, p. 66–70. Petrographic analysis and the description of this raw material for artefacts discovered in Precucuteni sites can be found in Crandell 2012; Crandell, Vornicu 2015.

¹³ Băgu, Mocanu 1984, p. 18–25; Ionesi 1989, p. 17–20; Văleanu 2015, p. 66–70.

¹⁴ Muraru 1990, p. 153.

¹⁵ Băgu, Mocanu 1984, p. 18–25.

¹⁶ Macovei, Atanasiu 1934, p. 181.

¹⁷ This type of flint appears also in other Chalcolithic settlements, being interpreted as flint from the Moldavian Platform (see Crandell 2012).

¹⁸ Boghian 2009, p. 122; Petrougne 1995, p. 191–192; Skakun 2007, p. 333; Петрунь 2004, p. 202–204.

- **A₄**: a good quality flint, of a yellow-like-honey colour, opaque, with a waxy texture, fine grained, with a thick chalky cortex (Pl. I/11), corresponding to what is named, in the archaeological literature, *Balkan flint*¹⁹. This A₄ class is represented by a sidescraper made on a cortical flake;

- **B₁**: a medium grained rock, of a whitish colour, with white spots, opaque²⁰, with conchoidal fracture (Pl. I/12–13). It has a percent of almost 3% of the total assemblage and is present in all the technological categories, except cores;

- **B₂**: a black-greenish, rough grained, opaque sandstone represented in the settlement by a flake and a debris (Pl. I/14);

- **B₃**: a medium-grained siliceous material, yellowish-red, with grey bands, waxy, opaque. A circular endscraper and a medial fragment of a retouched blade (Pl. I/15) were made from this raw material;

- **B₄**: a medium-grained rock with a waxy lustre and a chocolate colour represented in the settlement only by an endscraper on flake (Pl. I/16);

- **B₅**: a debris of quartzite (Pl. I/17).

The B group is heterogeneous, with a small incidence at the site (see Fig. 3) barely exceeding, in total, 3% of the collection.

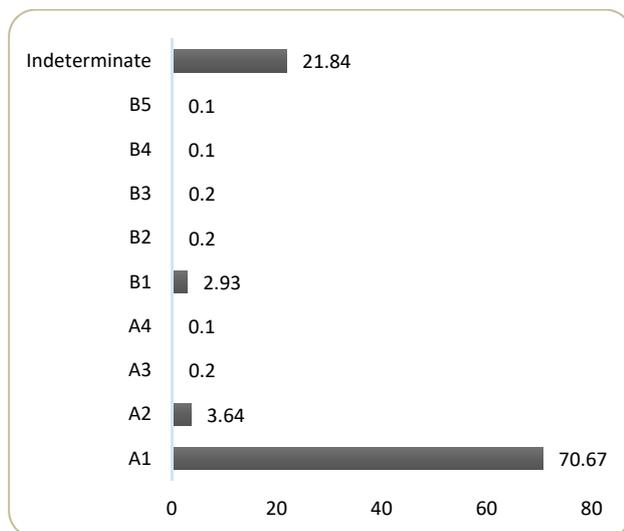


Figure 3. *Isaia – Balta Popii.* The ratio of the raw materials classes identified for the Early Chalcolithic assemblage.

Mentioned should be made of the fact that the percentage of the **heavy burnt materials**²¹ is high in the Precucuteni settlement from *Balta Popii* (20%) (Pl. I/18). This can be easily explained through the fact that the settlement ended in a heavy fire as it is proven by the archaeological record. Also, some flint could not be ascertained in one of the classes since it has a white or white-bluish patina covering all of its surface (Pl. I/19). The burnt flint and the one covered by patina will be referred in this paper as indeterminate.

At the moment, only for the A₁ class of raw materials is possible to establish its provenience. It also seems to be the only raw materials worked inside the settlement. For the other classes of raw materials, lacking any provenance studies, it is safer, for the moment, just to acknowledge their existence as separate entities.

THE CHIPPED STONE TECHNOLOGY

The presentation of the chipped stone assemblage is structured according to the succession of the reduction sequences.

Five **small flint nodules**, without human intervention, with water rolled outer surface, were registered for the collection from *Balta Popii*. As their neo-cortex proves (Pl. II/1–3), they had been subjected to intense weathering and water-rolling. This is one of the reasons why it can be assumed that these nodules were not taken directly from the outcrops in the Middle Prut valley but rather downstream, from the shores of the Prut River, which now runs at about 5 km from the site²². Alluvial neo-cortex is also visible on some of the cores and flakes.

In the **hard hammers** category were included the flint items that have a round (or almost round) shape and present wear in form of fissures and chipping (Pl. II/4–5). These specific fissures and chippings appear on the surface of the items used as hammers in knapping/retouching activities²³. The artefacts from this category are, in most of the instances, exhausted cores, but their use as hammers in knapping changed their morphology, giving them rounded edges, the

¹⁹ This artefact was included in a different class based on its resemblance with the other *Balkan flints* from the settlement from Târgu Frumos: Crandell, Vornicu 2015.

²⁰ This material resembles the white *flints* from Naslavcea, on the Dniester River, that can be found in the N. N. Moroşanu collection both in the Botoşani County Museum and on the Geological Museum from the "Al. I. Cuza" University.

²¹ The experiments made by the author tracked the macroscopic changes of flint (from the geological outcrops on the Prut River) at different temperatures. Thus, it was observed that temperatures higher than 600°C are needed for the flint to become of a white colour, to lose

some of its weight (probably because of dehydration) and to exhibit various cracks and chips on its surface, meaning to look like the heavy-burnt flint from Isaia. For the chemical and petrographic changes that occur when flint is submitted to very high temperatures see the experiments of Şt. Cucuş and A. Muraru in Cucuş, Muraru 1985, p. 607.

²² According to Văleanu 2003, p. 16, the flint nodules displaced by the Prut River can be found in the alluviums downstream, as far as in the vicinity of Galaţi town, near the place where the Prut flows in the Danube.

²³ Semenov 1964, p. 43.

technological markers being no longer visible on their mass. Most of them are quite small (five have a length less than 40 mm and three a length between 50–60 mm) and only is larger (90 mm).

Cores. In total, 20 cores can be attributed to the Early Chalcolithic Precucuteni settlement. The raw material is mainly the A₁ class; for three items, it is impossible to determine the material, being heavily burnt (Pl. III/3). The cores have, in general, small lengths, usually between 20 and 60 mm, with an average of 47 mm. Only one exceeds 80 mm in length but the specimen is affected by the heavy burning.

a) cores with flake negatives. Six cores have negatives of flakes knapped, before their abandonment, from their surface. These cores are of small dimensions, whether they were abandoned at the beginning or in the last phases of the debitage. This category is pretty heterogeneous in what concerns the shape and the debitage direction, most of the cores being cores with multiple knapping directions (Pl. III/1–2). Two items from this category, both with cortical surfaces, can be considered as pre-cores for further bladelet production (Pl. III/1). Their main platforms have abrasion marks. Also, mention should be made of the fact that the flakes produced from these preforms are round and were preferred as supports for the side- and endscrapers.

b) The cores with negatives of bladelets (n = 5: Pl. III/7–9) can be divided, depending on their form, in conical (n = 1), sub-conical (n = 2), prismatic (n = 1) and a fragment. The latter comes from a specimen with a flat debitage surface.

The conical core (Pl. III/9) has one small striking platform (15 × 11 mm) with overhangs not suppressed. Its debitage surface is flat, making an almost 90° angle with the striking platform. It was not circularly exploited, cortical inclusions being visible on its back. The negatives of nine bladelet removals that have regular, almost rectilinear edges are visible, along with some step accidents. One of the sub-conical cores, heavily burnt, had one striking platform and was not exploited circularly. The other sub-conical item (Pl. III/7) has one faceted and wide (50 × 32 mm) striking platform. The main exploitation of the core, on its frontal side, was made through narrow flat bladelets (of 25–30 mm in length and 5 mm wide), with almost rectilinear edges. The overhangs are not suppressed. The angle made by the debitage surface with the debitage platform is acute (60°). It was not circularly exploited.

The prismatic bladelet core (Pl. III/8) has two striking platforms, a main one used for removing most of the bladelets and another one secondary, opposite, from

where only one bladelet was removed. The overhangs were not suppressed. The same pattern of shaping out can be observed on the two platforms: they were created by flake removals but they also keep neo-cortex on their surface. The step accidents and the angle of platform that exceeds 90° led to the abandonment of this core. The negatives depict small bladelets, with not very regular edges. The debitage is semi-circular, the opposite face being covered with alluvial cortex.

c) For most of the cores that have negatives of blades (n = 7) their morphology and technological features cannot be reconstructed in detail since they were affected either by secondary use as hard hammers²⁴ (Pl. III/4–5) or were heavily burnt (Pl. III/3). The cores transformed into hard hammers (Pl. III/4–5) were circularly exploited, bidirectional, from two opposite striking platforms. About the two cores heavily affected by fire not much can be said (Pl. III/3) except the fact that on their debitage surface are visible negatives of straight regular blades and removals that shaped the distal part of one of the cores. The three remaining blade cores are quasi-conical in form, with one striking platform and unidirectional removals. On two of them are visible the attempts of creating new crest (Pl. III/6). On one of these cores abrasion marks are visible on the platform, the other one having a faceted platform. While two of them were circularly exploited, one still has a great amount of alluvial cortex on its surface, opposed to the debitage surface.

d) Two cores have negatives of **both bladelets and flakes** knapped from their mass. One of them has cortical surfaces; the flake removals are not in an organised form. It has only two bladelet removals, in the same direction, from the same platform which crushed during the exploitation. The other core stands out from this category through its support: a thick flake, resembling a carinated core. The overhangs are not suppressed; there is no preparation of the platform. The visible negatives are of a bladelet and four flakes from which one has a step distal end.

THE FLAKE ASSEMBLAGE contains 459 artefacts, both blanks and retouched. The preponderance of the flint from the Moldavian platform in the technological category of flakes is clear, since it has a percentage of 79% (n = 364). All the elements that can be related to core preparation and maintenance discovered in the settlement are also made of this raw material (the two partially crested flakes: Pl. IV/1, 3, the flakes knapped with the intention of removing natural accidents from the raw material, the six flakes for correcting the debitage surface and the striking platform).

²⁴ These items were not included in the hard hammers' category since the negatives of blades are still visible.

Almost half of the flakes made of Moldavian platform flint are cortical specimens – 40% (n = 149). Only 12 items have a 100% cortical dorsal surface and as a common characteristic they all lack the bulbs of percussion. The dimensions of the flakes are small, rarely exceeding 50 mm in length. As the debitage got into more advanced stages the flakes became smaller in metric characteristics (in length, width and thickness) when compared to the flakes from the initial stages.

When the proximal parts of the flakes are present

Platform type	Cortical	Plain	Dihedral	Facetted	Linear	Punctiform	Crushed	TOTAL
Layer IIA	15	66	4	6	11	3	4	109
Layer IIB	19	59	5	10	6	4	3	106
Layer III	8	53	6	7	9	3	5	91
TOTAL	42	178	15	23	26	10	12	306
% of total	13.72	58.16	4.90	7.51	8.49	3.26	3.92	100

Table 3. *Isaia – Balta Popii.* The types of platforms of the flake assemblage made from the A₁ raw material discovered in the Early Chalcolithic settlement.

Only 26 flakes show dorsal reduction in form of hinged scars (n = 24) and abrasion (n = 2). The negatives of previous removals visible on the dorsal surfaces of the flakes show that they were obtained, in most of the cases, from cores with multiple directions of knapping (n = 60), less unidirectional (n = 55), very few bidirectional (n = 7). As for the accidents that happened during knapping, the step (n = 63) and hinged (n = 44) terminations of the distal parts have a quite high frequency and another flake has a plunging distal end (Pl. IV/1).

From the characteristics of the flake assemblage discovered at *Balta Popii*, it can be presumed that most of the flakes from Moldavian platform flint were produced at the site, all stages of knapping being attested. The debitage was most likely done by hard direct percussion, with flint hammers.

The flakes from other raw materials are represented either only by one specimen (meaning 0.21% as is the case with the A₄, B₂, B₃, B₄ classes), or by more specimens, but never exceeding 4% of the flake collection (the B₁ class has 16 items, meaning 3.46% and A₂ – 10, meaning 2.16%). They have, in general, secondary modification, being transformed into endscrapers or scrapers. It is the case of the endscraper on a cortical flake from A₄ class of flint, the endscraper on thin flake made of B₄ class or thick flakes as the case of B₃ class. The 10 flakes of A₂ category are both cortical (Pl. I/7–8) and non-cortical specimens, some of them transformed into endscrapers. Three out of the 16 B₁ items are cortical flakes, while the others were transformed into scrapers. As a common characteristic, the flakes that were not made from A₁ material, are narrower and thinner (see Fig. 4).

(n = 306) it can be observed a clear domination of the unprepared platforms, both plain and cortical (Table 3). None of the variables in which the platforms present themselves can be related strictly to a single variable of the bulb (as the bulb's appearance, the bulbar scars) or of the distal part. For example, the plain platforms are associated with big bulbs in 139 cases, but in 39 cases the bulbs lack. The lipped platforms have an incidence of 21 cases²⁵: in most instances these platforms are also wide and plain, accompanied by big bulbs.

Most of the 65 flakes from indeterminate raw materials are fragmented. The ones that still have their proximal ends have in 29 cases wide plain platforms (lipped in six instances), cortical in three cases, dihedral and facetted in two cases. The burnt items have cracks and various exfoliations of their surfaces.

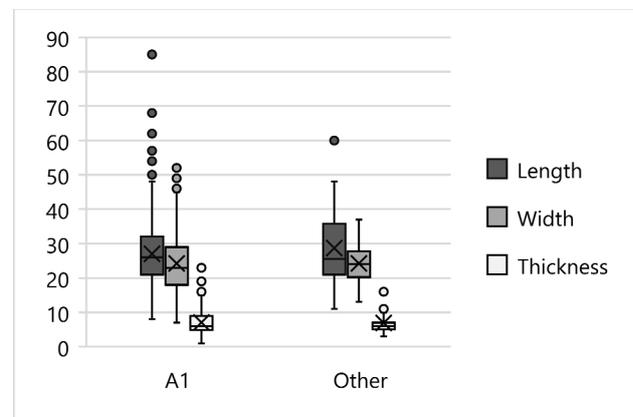


Figure 4. *Isaia – Balta Popii.* Boxplots and whiskers comparing the metric characteristics (in mm) of the flakes made from A₁ class of raw material and other materials.

THE BLADE ASSEMBLAGE discovered in the site comprises 205 items, 149 of which remained unretouched. The majority of the blades is fragmented (Table 4). In some cases, the purpose of fragmentation is related to the need of creating a certain type of tool (as is the case of the trapezes or the blades with retouched truncation), but in the majority of cases the purpose of the fragmentation remains unknown.

²⁵ Although some authors see the presence of the lips as a consequence of using soft hammer percussion (Crabtree 1972, p. 74; Inizan *et alii* 1996, p. 36), others showed that its appearance is rather related to the

angle of the blow or the inclination of the platform (Calley 1984, p. 25; Pelcin 1997, p. 618) and its ratio in an assemblage can be rather linked to the knappers' style (Driscoll, García-Rojas 2014, p. 139).

The blade assemblage is also dominated by the flint from the Moldavian platform, but in a smaller percentage than in the case of the flakes (58.53%). The 21 intact specimens can be divided, according to their dimensions, in bladelets and blades.

As bladelets were classified three elongated products that have a length less than 50 mm, a width ≤ 12 mm and a thickness ≤ 4 mm (Pl. IV/15). They all are *plein débitage* products, knapped from unipolar cores, with hinged distal ends, no dorsal reduction (the overhangs are not suppressed). Two of them have wide, plain platforms and visible bulbs while the other has a linear platform (since for its removal it was struck the edge of the platform), no bulb, but strong ripples on its dorsal surface and a hinge distal end.

The intact blades ($n = 18$) are usually short and wide ($n = 12$; Pl. IV/2, 6, 8–10, 13–14, 16–17), less frequently short and narrow ($n = 3$; Pl. IV/7, 11–12) or medium-long blades ($n = 3$; Pl. IV/4). The short specimens are rather what can be called lamellar flakes, their edges and shapes being quite irregular. Most probably they were knapped through direct hard hammer percussion. One is a partially crested blade (Pl. IV/6) and another has cortex on 70% of its dorsal face. One medium-long blade (Pl. IV/4) was removed, in my opinion, in order to correct a debitage surface that suffered a hinge accident caused by the presence of cortical inclusions. It has a dihedral platform, some dorsal reduction in form of flaking but no suppressed overhangs. Another intact medium-long blade ($55 \times 23 \times 8$ mm), with irregular edges and ridges, has cortex on almost 90% of its dorsal surface.

The image given by the intact blades is totally different from the image of the blade technology resulting from the fragmented blades (Pl. V/1–7, 9, 12–15, 17–19, 21, 23–26, 28–31, 33, 35, 38–39). The latter derive mainly from more supple products than the intact ones. Also, they differ from the intact ones through the regularity of their edges and ridges. 35 fragmented items have a straight profile and rectilinear – parallel edges and ridges (Pl. V/12, 17, 29–30).

They were knapped from unidirectional cores; only in one case it is visible the bidirectional knapping. In the blade technology, it can be observed a higher attention than in the flake technology to the preparation of the platforms (Table 5). As is the case with flakes, also the variables of the platforms of the blades cannot be related to only one variable of the bulb. Only the blades with punctiform platforms exhibit no bulbs. Two platforms have impact scars from hard hammers and 28 are lipped.

No cortical platform was registered for the blade inventory. Nevertheless, blades with cortex on their dorsal surface are part of the collection; apart from the two intact specimens mentioned earlier, three other fragmented blades have cortex on less than 10% of their dorsal surfaces (Pl. V/35, 39). This shows the fact that the blade debitage begun, in some cases, without an anterior total decortication of the core.

Dorsal reduction is rare in the case of the blades: on nine proximal ends can be seen either abrasion or small removals. To them it can be added a blade with a plunging accident (Pl. IV/5), originating from a bidirectional core, with traces of abrasion on the platform. The overhangs are rarely suppressed.

Raw material	Intact	Medial parts	Proximal ends	Lacking proximal	Distal ends	Lacking distal	TOTAL
A1	21	35	6	14	12	32	120
A2	2	14	1	2	2	7	28
A3	-	2	-	-	-	-	2
B1	-	5	-	1	-	2	8
B3	-	1	-	-	-	-	1
Burnt	1	19	-	4	1	11	36
With patina	1	2	-	3	2	2	10
TOTAL	25	78	7	24	17	54	205
% of total	12.19	38.04	3.41	11.70	8.29	26.34	100

Table 4. Isaiia – Balta Popii. The fragmentation of the blades in relation with their raw material.

Platform type	Plain	Dihedral	Facetted	Linear	Punctiform	Crushed	TOTAL
Layer IIA	12	5	5	1	1	-	24
Layer IIB	9	3	5	2	1	1	21
Layer III	7	2	4	-	-	-	13
TOTAL	28	10	14	3	2	1	58
%	48.27	17.24	24.13	5.17	3.44	1.72	100

Table 5. Isaiia – Balta Popii. The types of platforms specific for the blade assemblage made from the A₁ class of raw materials discovered in the Early Chalcolithic settlement.

As for the metric characteristics of these blades, they are small sized (Figs. 5 and 6), the majority having their width less than 20 mm and thickness under 5 mm.

It is impossible, at the moment, mainly because of the high fragmentation of the blades, to say whether for their detachment was used indirect percussion or pressure, both techniques producing blades with regular edges. The association of three characteristics is considered as a strong sign of using pressure: “the extreme regularity of the edges and ridges; the almost straightness of the profile, except for a curved distal portion; and the “lightness” of the section, meaning that the blades are (or can be, for some of them) relatively thin”²⁶. Of the 53 blades from Moldavian platform flint with regular edges and ridges, 28 seem to present all these elements on the same item.

To the A₂ class of raw materials were assigned 28 blades (Pl. V/8, 11, 16, 22, 32, 36), thin (the majority less than four mm) and not very wide, most of them with rectilinear edges and ridges, all coming from unipolar cores. Five have a thin cortex on their dorsal surface. Half of their platforms are unprepared but the other half is dihedral (Pl. V/8, 16) and faceted (Pl. V/11). Some of these items can be considered as being knapped by pressure technique (Pl. V/11). Almost all the blades from this class of raw materials seem to be high technological achievements, with regular, almost rectilinear edges. All have edge removals caused by use and five have sickle gloss on their edges (Pl. V/32).

The two blades from the A₃ raw material (Pls. V/27, VI/35) are very different in what concerns their morphology and dimensions. One is a medial fragment from a *plein débitage* massive specimen (56 × 24 × 5 mm – Pl. V/27) while the other is a fragment coming from a small cortical blade transformed into an endscraper (Pl. VI/35).

The eight B₁ blades are all fragmentary, small sized, with rectilinear edges and ridges (Pl. V/37), half of them

with straight profiles. The two items that have a proximal end have wide platforms, one faceted, the other plain with a lip and no suppressed overhangs.

As for the non-flint raw materials, only a medial fragment coming from a thick blade was discovered (Pls. I/15, VII/29).

One bladelet (Pl. IV/18) and a blade of indeterminate raw materials were discovered intact. The plain platforms are the most frequent in this class of materials (n = 7) while dihedral, faceted and linear platforms have, in total, four specimens. As the case with the A₁ raw material the overhangs are not suppressed in almost half of the cases.

At the *Balta Popii* settlement there was discovered a high number of shatters and waste, mainly from Moldavian platform flint (Table 2), with quite frequent cortical specimens. One quartzite shatter was recorded for the assemblage.

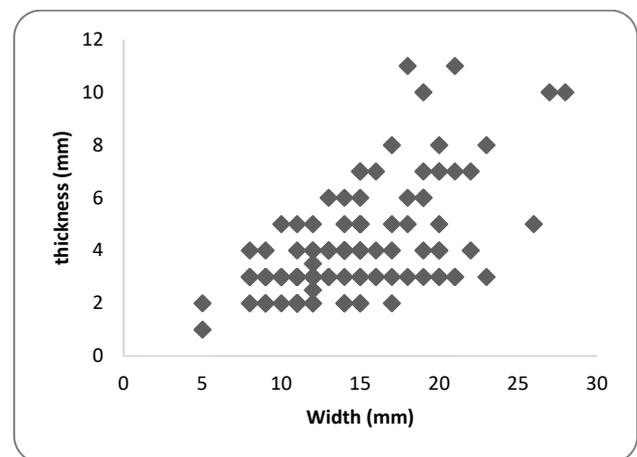


Figure 5. *Isaia – Balta Popii*. The metric characteristics (width and thickness in millimetres) of the blades made from Moldavian platform flint.

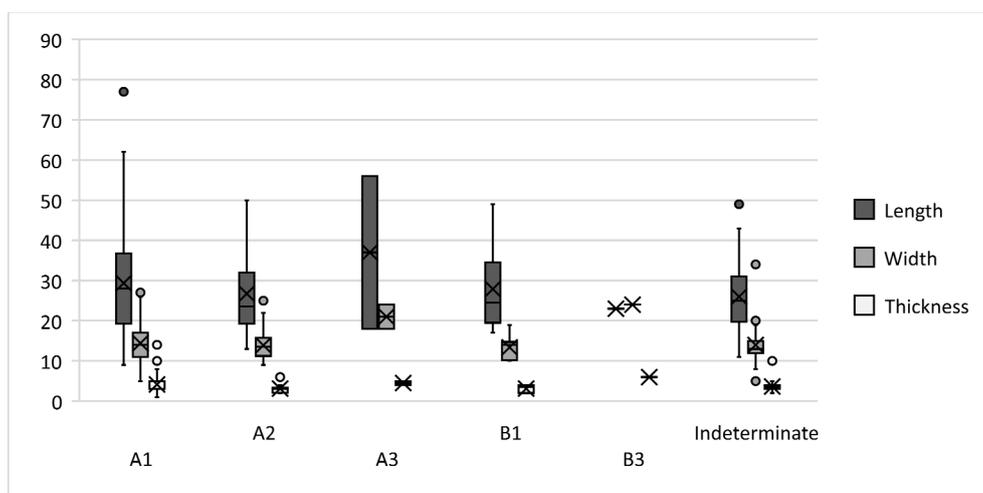


Figure 6. *Isaia – Balta Popii*. Boxplots and whiskers comparing the metric characteristics (in millimetres) of the blades made of various raw materials discovered.

²⁶ Pelegrin 2002, p. 216; 2006, p. 42.

THE TYPOLOGY OF THE CHIPPED STONE ASSEMBLAGE

The most numerous category of retouched pieces is represented by **endscrapers** (n = 140) (Pl. VI - Table 6). Their majority is made on flakes (n = 126) (Pl. VI/1–2, 4–7, 9–13, 15–23, 25, 27–34, 37–38), 20% of which are cortical (both cortex and neo-cortex). Morphologically, the flakes selected for being transformed into endscrapers are either short - thick (Pl. VI/11, 12, 15–17, 19, 20–33), or pygmy; thin specimens were rarely chosen (Pl. VI/1–2, 21, 34). Thus, the blanks are standardised in terms of width and thickness (Fig. 7). The length of these products never surpasses 50 mm, being rather microlithic pieces.

Most of the endscrapers on flakes are simple convex ones (n = 62: Pl. VI/1–2, 6, 9–11, 15, 17, 21, 23, 25, 27); 13 of them are pygmy pieces (their length does not surpass 20 mm: Pl. VI/31, 34). In 46 cases the retouches cover both the distal end and the edges of the flakes, these items being assigned to the semi-circular (n = 29: Pl. VI/5, 13, 16, 18, 20, 22, 30, 32, 38) and circular (n = 17: Pl. VI/28–29, 33) categories. A few nosed (n = 10: Pl. VI/26, 36–37) and even fewer ogival (n = 5: Pl. VI/4, 12), slightly denticulated (n = 2: Pl. VI/7) and double (n = 1) endscrapers were discovered.

For two convex endscrapers the supports could not be accurately established, while another one seems to be made on a core maintenance element (a tablet?).

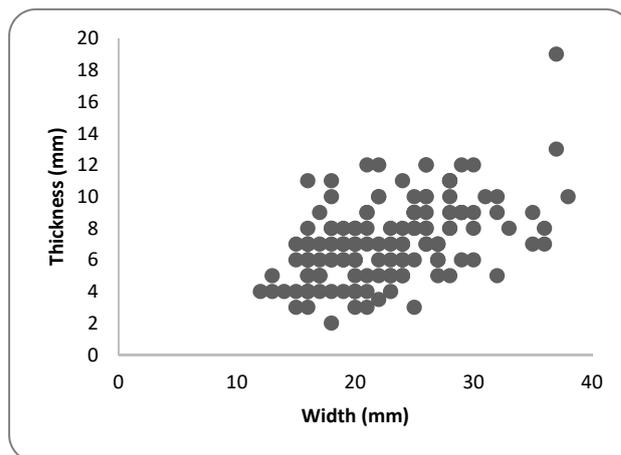


Figure 7. Isaiia – Balta Popii. The metric characteristics (width and thickness in millimetres) of the endscrapers from the Early Chalcolithic layers.

The blades selected as blanks for endscrapers (Pl. VI/3, 8, 14, 35) are mainly fragmented pieces (nine out of 11), not very long, but rather wide, less elongated (their average of the length/width ratio is 1.35). The two intact blades are short-thin items (Pl. VI/3). Five of the supports have retouches on one of the edges (Pl. VII/14), while two present *sickle gloss* (Pl. VI/35). All the endscrapers made on blades are convex specimens.

The use-wear analysis of some endscrapers from the site showed that they were mostly utilised in hide processing, both with and without mineral additives²⁷.

Typological category	IIA	IIB	III	TOTAL	% of total
Endscrapers	55	46	39	140	52.23
Sidescrapers	16	15	9	40	14.92
Retouched flakes	8	6	10	24	8.95
Retouched blades	14	5	5	24	8.95
Blades with retouched truncation	4	2	1	7	2.61
Notched pieces	-	-	5	5	1.86
Denticulated pieces	3	1		4	1.49
Borers	-	2	1	3	1.11
Trapezes	3	1		4	1.49
Others	5	3	2	10	3.73
Double items	-	2	3	5	1.86
Arrowheads	-	1	1	2	0.74
TOTAL	108	84	76	268	100

Table 6. Isaiia – Balta Popii. The main typological categories from the Precucuteni layers.

As frequency, the **sidescrapers** come in second in the retouched products category (n = 40: Pl. VII/1–16, 21, Table 6). They were made on the convex edges of the flakes, some of them cortical (n = 9). Their sizes are comparable with those of the endscrapers (Fig. 8). To this it must be added that more than 70% of the end- and sidescrapers from *Balta Popii* are made of the greyish-white variety of Prut flint. Their shape is also standardised since the blanks chosen for these retouched products are round/ovoid. Four of the sidescrapers are retouched inversely (Pl. VII/9, 16), while nine are double (with

retouches on both edges: Pl. VII/3, 5, 10, 21).

The high number of **retouched flakes** (n = 24: Pl. VII/17–20, 22) can be seen as a consequence of the fact that the knapping done inside the settlement produced more flakes than blades. Both macrolithic and microlithic flakes, coming from different stages of the debitage, were selected for secondary modifications. Only three items have both edges retouched: in one case alternating (direct on the right edge and inverse on the left edge), in another semi-abrupt on both edges and in the third case invasive, continuous. When only one of the edges was retouched

²⁷ Vornicu 2012b.

(n = 16), this was never done by covering all of its length (Pl. VII/17–20). The retouches are usually direct, low angle, either marginal (n = 6), or invading (n = 6: Pl. VII/18) but also

semi-abrupt (n = 4). The distal part is modified in five instances (Pl. VII/22).

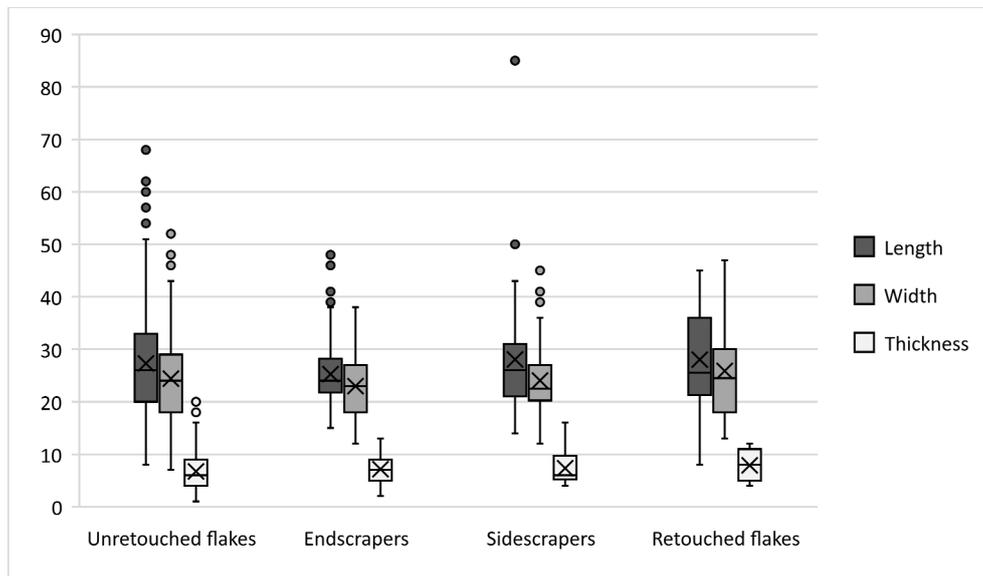


Figure 8. Boxplots and whiskers comparing the metric characteristics (in millimetres) of the unretouched and secondary transformed flakes.

Of the 24 **retouched blades** (Pls. IV/2, 4, 16, VII/23–30) only eight are intact. A preference was observed in modifying the left edges of the blades (n = 18) with direct, marginal, low angle retouches (Pls. IV/16, VII/28). In the case of inverse retouches, in four of nine instances they are semi-abrupt (Pl. VII/27, 30). Only one item has the right edge modified, and this was made through bifacial retouching. Five blades have their both edges modified (n = 5; Pl. VII/23, 25, 26, 29).

The seven blanks selected for being transformed into **pieces with retouched truncation** are *plein debitage* narrow, thin blades (Pl. VIII/2–4). Four items have their truncation oblique, making an acute angle with the technological axis of the support (Pl. VIII/2–3). In the other three cases, the truncation is almost perpendicular on the axis (Pl. VIII/4). The retouch is steep, in all instances. One blade is covered by a white patina on its entire surface excepting the retouches. This indicates the fact that the blade was already covered by the patina when its secondary processing took place.

The **notched pieces** have as blanks either blades (n = 3: Pl. VIII/1, 5), or flakes (n = 2: Pl. VIII/6). The notches are diverse as morphology and invasiveness. The notch made on the right edge (Pl. VIII/1), near the proximal part of a blade, had no functionality since the use-wear analysis showed no wear related to it²⁸.

The **denticulated** items were made both on thin-short blades (n = 1: Pl. VIII/8) and thick-short flakes (n = 3: Pl. VIII/7). Usually, the denticulations were created on the

ventral surface of one edge; only one item has denticulations both on the lateral side and distal end (Pl. VIII/8).

Interesting is the fact that from the tree **borers** discovered in the Precucuteni layers (Pl. VIII/9–11), two were made on the proximal periphery of blades (Pl. VIII/9–10), one with a plunging distal end (Pl. VIII/9). The way in which the three borers were realised is similar, meaning by abruptly retouching two convergent edges of the blades, until a point was obtained. In all the cases, the retouch is bifacial on the pointed end. One of them (Pl. VIII/9) was used in hide processing as the use-wear analysis showed²⁹.

The four **trapezes** were created by abruptly retouching the truncations of *plein debitage* microblades (Pl. VIII/12–13), with parallel edges and ridges and straight profiles. Their metric characteristics are standardised (length: 18–20 mm, width: 9–10 mm, thickness: 2 mm).

The **two arrowheads** from Isaiia are some of the earliest finds of such type for the Precucuteni-Trypillia A settlements. One is a foliaceous point heavily burnt (Pl. VIII/17). The other is worked pretty rudimentary, with denticulate edges (Pl. VIII/18).

In the category called *double-pieces* (Table 6) were included items that, through their various secondary modifications, can be assigned to more than one type, as: an endscraper on a notched blade, a borer-endscraper (Pl. VIII/15), a retouched truncation on a backed blade

²⁸ Vornicu 2012b.

²⁹ Vornicu 2012b.

(Pl. VIII/14), a scraper on a splintered piece, and an endscraper on a backed blade.

Also, some difficulties were encountered for categorising ten specimens from the whole assemblage (the *Others* category in Table 6). Seven of them are fragments of retouched pieces (Pl. VIII/16), being impossible to reconstruct their initial form. In the other three cases the problem is that their denomination is delicate since their secondary modifications cannot be assigned to a type: a blade with half retouched truncation, a blade with the truncation concavely retouched (can it be denominated as a truncated piece or a notched one?) and a small rectangular plaquette of flint with abrupt retouches on three edges.

CONCLUSIONS

The chipped stone collection discovered in the Early Chalcolithic settlement from Isaiia – *Balta Popii* is characterised by the high frequency of Cretaceous flints, specific for the Moldavian platform, mostly taken from secondary geological sources. The analysis of the lithic collection shows the fact that all the sequences of reduction for this raw material were carried inside the settlement. This is revealed by corroborating all the constituting elements of the assemblage: the flint nodules, the cores (some of them with attempts of reshaping), the high frequency of cortical flakes, the amount of debris, the presence of flakes for correcting the debitage surface, the tablets for correcting the striking platform and the flint hammers. Nevertheless, the intensity of the knapping activities that took place inside the settlement is quite low when compared to other Precucuteni II – Tripolje A sites, especially to those situated in the proximity of raw material sources³⁰.

The specificity of the assemblages made of the other raw materials points to the fact that they were most probably not worked inside the settlement.

The cores from the Early Chalcolithic layers in *Balta Popii* are of small dimensions, most of them bearing negatives of blades and bladelets removals. The debitage of the bladelets is never circular, portions of neo-cortex covering the unexploited faces. Unidirectional exploitation of cores was preferred for both blade and

bladelet knapping. Dorsal reduction and abrasion are technological gestures seen on the platforms of the blades. The faceting of the platform appears mostly on the bladelet cores. The overhangs from previous removals were, in almost half of the cases, not suppressed when the knapping occurred. Indirect percussion and pressure were both probably used for blade and bladelet removal.

The blades found inside the settlements are of small sizes, with regular edges. Their width is most of the time smaller than 20 mm. A similarity of the metric characteristics of blades can be observed in the flint inventories discovered in other Precucuteni II – Tripolje A sites as those from Trifești³¹, Larga Jijia³², Ghigoești³³ (nowadays Romania), Bernashevka³⁴ (Ukraine), Alexandrovca³⁵, Isacova II³⁶ (Republic of Moldavia).

The settlement from Isaiia has similarities, through its panoply of retouched products, with most of the contemporary settlements, the attested types being: endscrapers, sidescrapers, retouched blades and flakes, notched and denticulated pieces, blades with retouched truncation, trapezes. A standardisation in choosing the blanks (small, thick and oval/circular flakes) and in the morphology of the sidescrapers and endscrapers was observed for the lithic inventory of these Early Chalcolithic communities³⁷. Broadly, the Precucuteni II – Tripolje A chipped stone assemblage continues the tradition from the previous phase³⁸, but novelties do appear as the emergence of arrowheads attested at Isaiia and Florești I³⁹. This specific type is absent from the lithic industries of the Neolithic cultures from the eastern-Carpathian area (both Starcevo Criș and the Liniarbandkeramik) and also from the first phase of Precucuteni culture⁴⁰.

From the data, available at the moment, it seems that the lithic industry from the second phase of Precucuteni – Tryppilia A culture has well defined characteristics, common for the collections from various sites, as: the high frequency of flakes, the small metric characteristics of the blades/bladelets of regular and almost parallel edges, the overall predominance of endscrapers in the retouched products, similarities in choosing the supports for these endscrapers, the high amount of sidescrapers. The degree in which these features might indicate a common technological background for the Early Chalcolithic industries requires future exploration of the matter and a joint effort of the

³⁰ For example, at Bernashevka (nowadays Ukraine) were discovered more than 8000 items, both in the old (Збенович 1980, p. 68) and new excavations (Шидловський, Слесарев 2015, p. 338).

³¹ Iconomu 1998, fig. 16.

³² Păunescu 1970, p. 46.

³³ Marinescu-Bîlcu 1974, p. 45.

³⁴ Mainly those from the new excavations: Шидловський, Слесарев 2015, p. 338.

³⁵ Кобаленко, Бодян 2006.

³⁶ Sorochin 1999.

³⁷ This identity is visible, for example, when comparing the assemblage from Isaiia with the one from Alexandrovca I (Кобаленко, Бодян 2006, p. 204–209).

³⁸ See Țurcanu 2009.

³⁹ Dergacev 2000, p. 51.

⁴⁰ Țurcanu 2009.

specialists working in the area, from Romania, Republic of Moldova and Ukraine.

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Plate I. The raw material classes from Isaiia – Balta Popii. 1–6: A₁ class, 7–9: A₂ class, 10: A₃ class, 11: A₄ class (ventral), 12–13: B₁ class, 14: B₂ class, 15: B₃ class, 16: B₄, 17: B₅, 18: heavy burnt flint, 19: flint covered by a white-bluish patina. The bar from each artefact represents 1 cm.

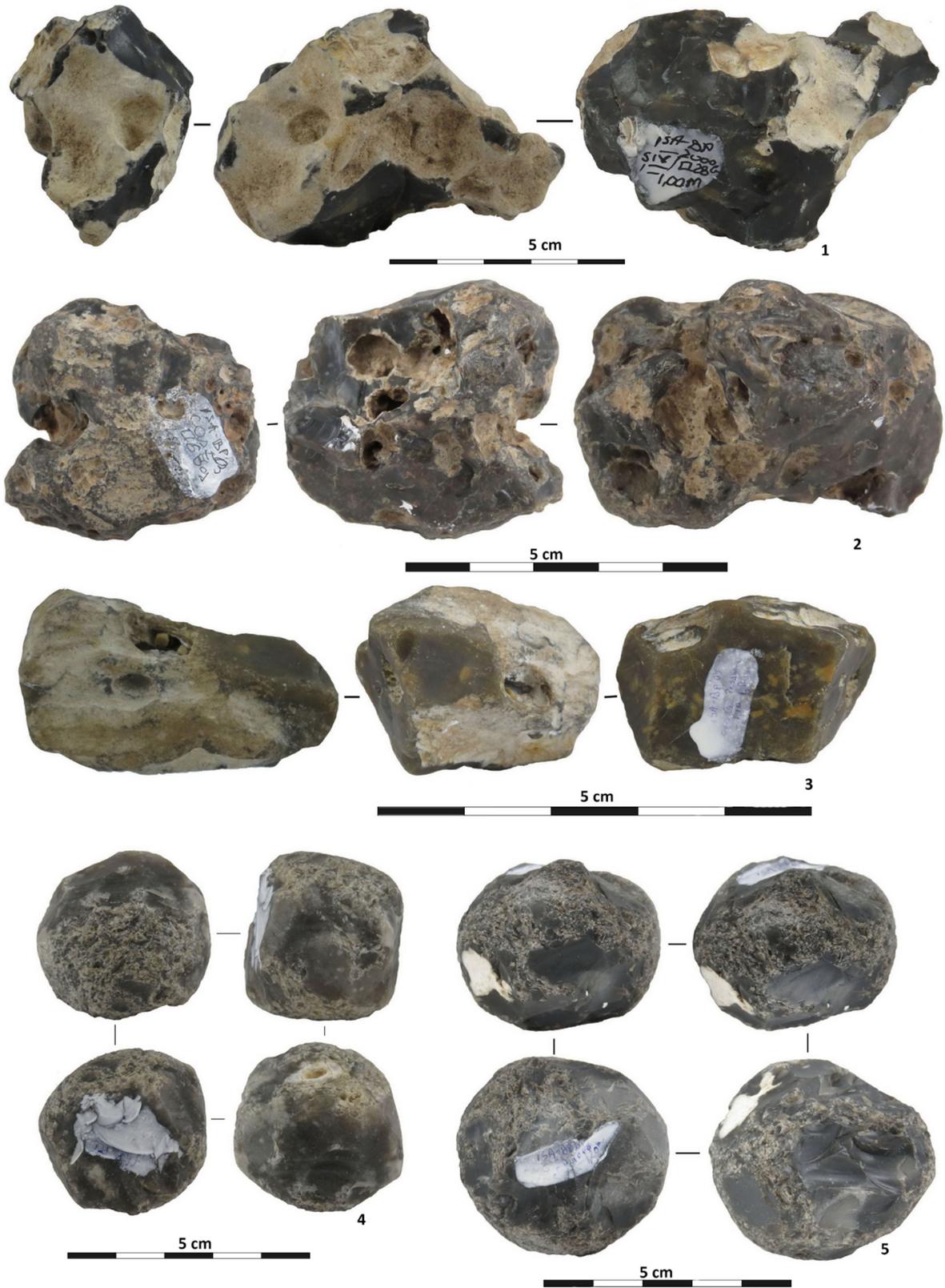


Plate II Isaiia – Balta Popii. 1. Flint nodules (1–3) and hard hammers/retouchers (4–7) discovered inside the Early Chalcolithic settlement.



Plate III. Isaiia – Balta Popii. Cores with flake (1-2) and blade negatives discovered inside the Early Chalcolithic settlement.

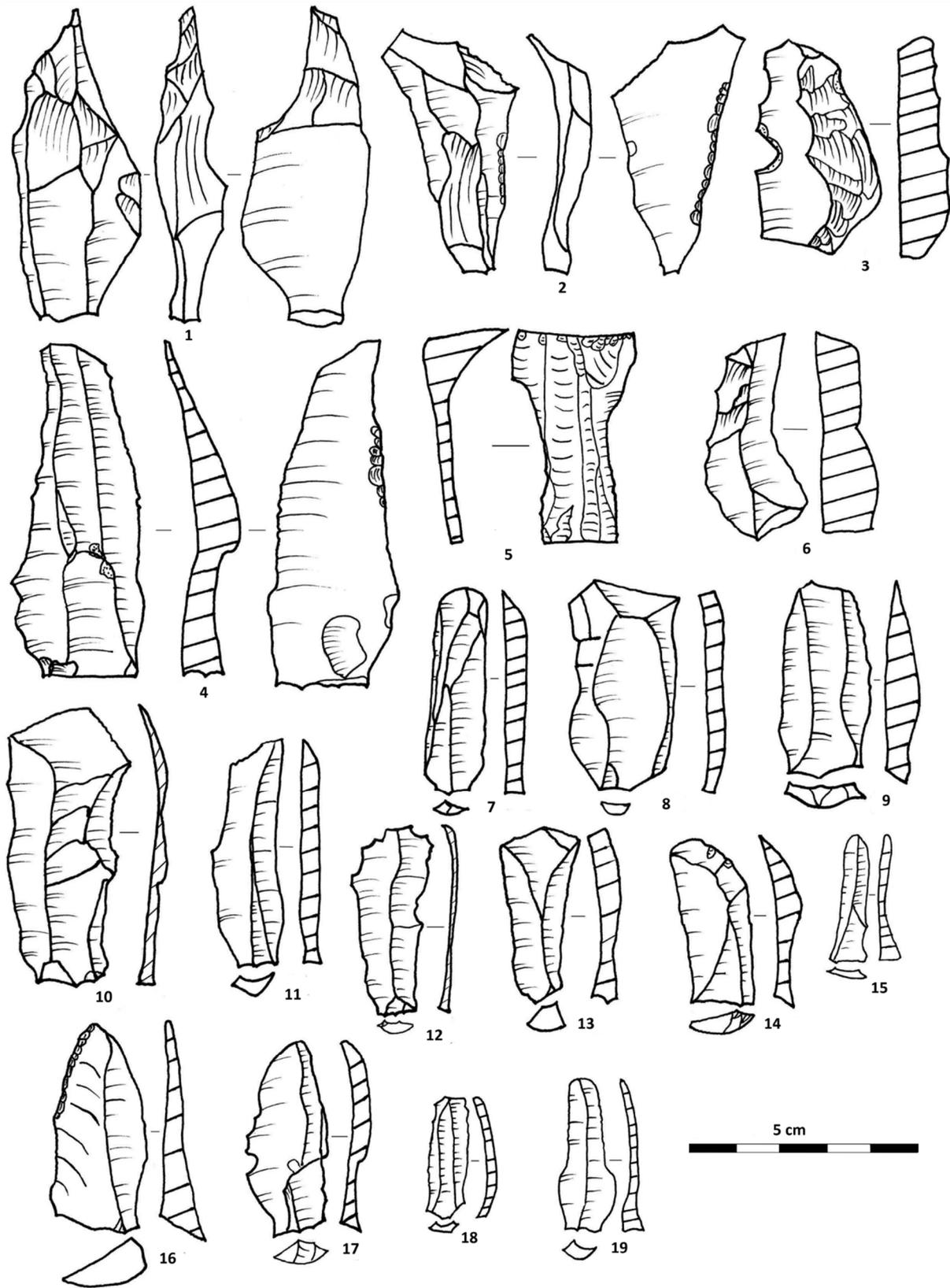


Plate IV. Isaiia – Balta Popii. Flakes (1, 3) and blades (2, 4–19) discovered in the Early Chalcolithic settlement.

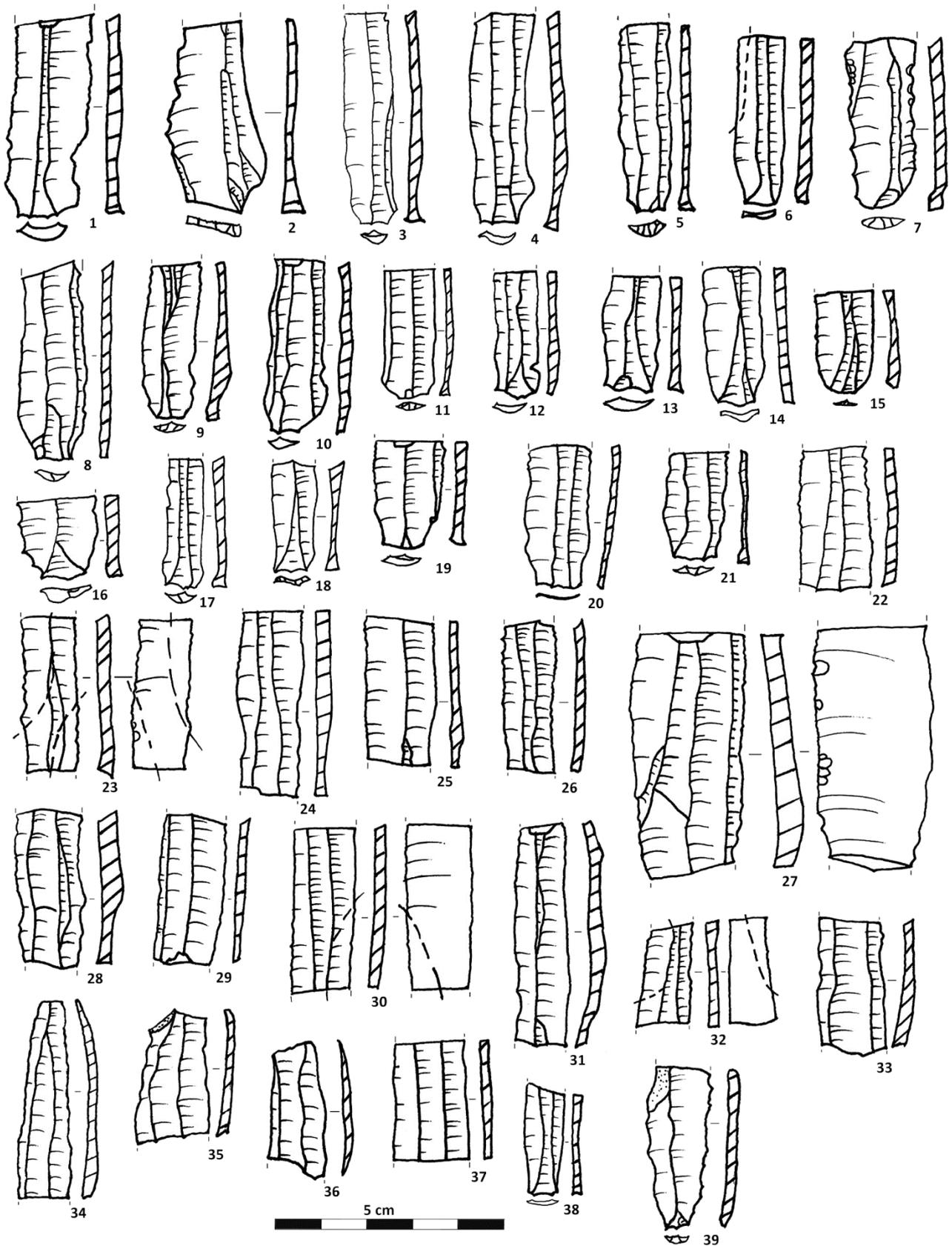


Plate V. Isăia – Balta Popii. Blades discovered in the Early Chalcolithic settlement.

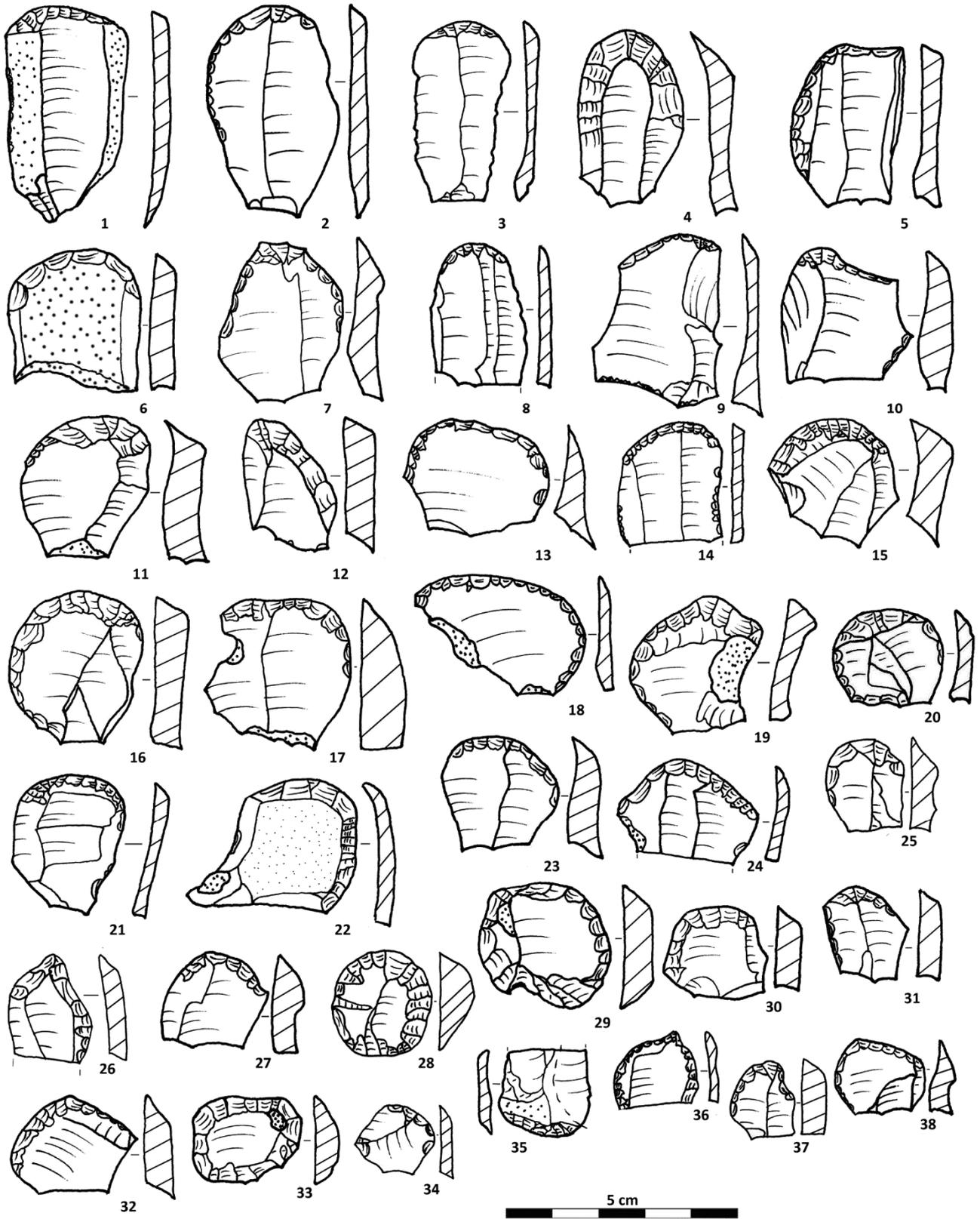


Plate VI. Isaiia – Balta Popii. Endscrapers discovered in the Early Chalcolithic settlement.

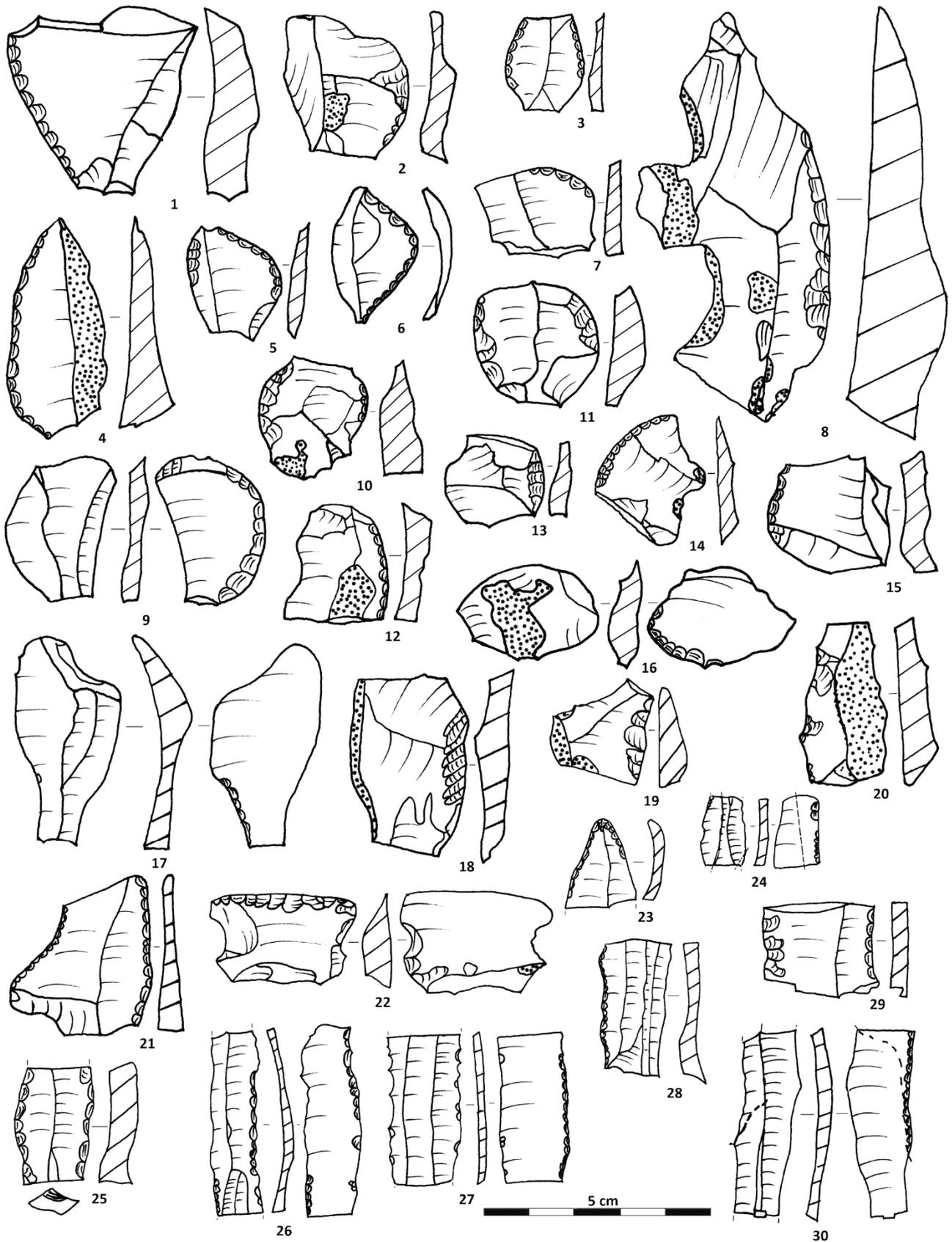


Plate VII. Isaiia – Balta Popii. Siderscrapers (1–16, 21), retouched flakes (17–20, 22) and retouched blades (23–30) from the Early Chalcolithic settlement.

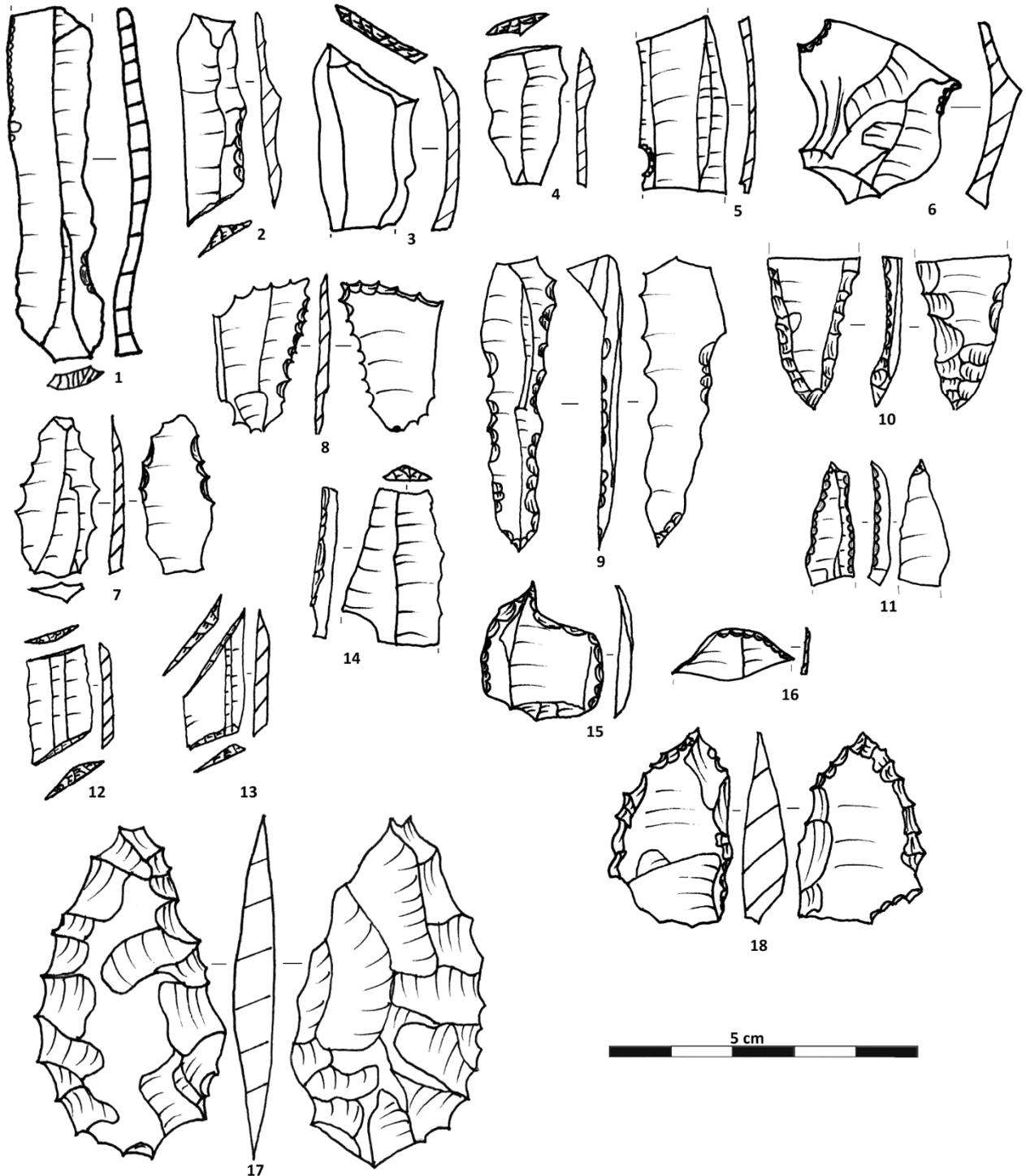


Plate VIII. Isaiia – Balta Popii. Notched (1, 5–6) and denticulated (7–8) pieces, blades with retouched truncation (2–4), borers (9–11), trapezes (12–13), arrowheads (17–18) and atypical items (14–16) discovered in the Early Chalcolithic settlement.

ABRÉVIATIONS / ABBREVIATIONS / ABREVIERI

- AA – Archäologischer Anzeiger. Deutsches Archäologisches Institut, Darmstadt, München, Tübingen–Berlin
Acta MN – Acta Musei Napocensis Cluj-Napoca
ActaMP – Acta Musei Porolissensis, Zalău
AJA – American Journal of Archaeology, Boston
Altertum – Das Altertum, Deutsche Akademie der Wissenschaften zu Berlin Sektion für Altertumswissenschaft
Akademie der Wissenschaften der DDR Zentralinstitut für Alte Geschichte und Archäologie, Berlin
AnB – Analele Banatului, Muzeul Banatului, Timișoara
Antiquity – Antiquity. A Review of World Archaeology, Durham, UK
ArchBulg – Archaeologia Bulgarica, Sofia
AIGR – Anuarul Institutului Geologic al României, București
AIIA Cluj – Anuarul Institutului de Istorie și Arheologie, Cluj-Napoca
AM – Mitteilungen des Deutschen Archäologischen Instituts, Athenische Abteilung
Apulum – Acta Musei Apulensis. Muzeul Național al Unirii, Alba Iulia
ArchKorr – Archäologisches Korrespondenzblatt, Mainz
Argesis – Argesis. Muzeul Județean Argeș. Pitești
ArhMold – Arheologia Moldovei, Iași
BA – Biblioteca de Arheologie, București
BAI – Bibliotheca Archaeologica Iassiensis, Iași
BARIntSer – British Archaeological Reports. International Series, Oxford
BCȘS – Buletinul Cercurilor Științifice Studentești. Arheologie – Istorie – Muzeologie, Alba-Iulia
BICS – Bulletin of the Institute of Classical Studies of the University of London, London
Bjb – Bonner Jahrbücher des Rheinischen Landesmuseums in Bonn, Bonn
BMA – Bibliotheca Memoriae Antiquitatis, Piatra-Neamț
BMJT – Buletinul Muzeului Județean Teleorman, Alexandria
BMMN – Buletinul Muzeului Militar Național, București
BMTA Giurgiu – Buletinul Muzeului „Teohari Antonescu”, Giurgiu
BPS – Baltic-Pontic Studies, Poznań
Britannia – Britannia. A Journal of Roman-British and Kindred Studies. Society for the Promotion of Roman Studies, Cambridge
BSA – British School at Athens, Athens
BSPF – Bulletin de la Société Préhistorique Française, Paris
CA – Cercetări Arheologice, București
Carpica – Carpica. Complexul Muzeal „Iulian Antonescu” Bacău, Bacău
Carst – Cercetare, explorare, Actualitatea speo, Recenzii, editorial, Știință, Tehnică, Cluj-Napoca
CCA – Cronica Cercetărilor Arheologice din România, București
CCDJ – Cultură și Civilizație la Dunărea de Jos, Călărași
CEFR – Collection de l'École Française de Rome
CercIst – Cercetări Istorice, Iași
Dacia – Dacia (Nouvelle Série). Revue d'archéologie et d'histoire ancienne. Académie Roumaine. Institut d'archéologie « V. Pârvan », Bucarest
Documenta Praehistorica – Documenta Praehistorica, University of Ljubljana, Faculty of Arts, Department of Archaeology
EphemNap – Ephemeris Napocensis. Academia Română, Institutul de Arheologie și Istoria Artei, Cluj-Napoca
ERAUL – Études et Recherches archéologiques de l'Université de Liège
ÉtThas – Études thasiennes, École Française d'Athènes, Athènes-Paris
EurAnt – Eurasia Antiqua. Deutsche Archäologisches Institut, Berlin
GodišnikSofia – Godišnik na Sofijaskija Universitet „Sv. Kliment Ochridski”, Istoriceskij fakultet, Sofia
Hesperia – Hesperia. Journal of the American School of Classical Studies at Athens, Cambridge
IFAO – Institut français d'archéologie orientale, le Caire
JAS – Journal of Archaeological Science

Kernos – Revue internationale et pluridisciplinaire de religion grecque antique, Liège
Marisia – Marisia. Studii și materiale. Arheologie – Istorie – Etnografie, Târgu Mureș
MemAnt – Memoria Antiquitatis, Piatra Neamț
MCA – Materiale și Cercetări Arheologice, București
OLBA – Mersin University Publications of the Research Center of Cilician Archaeology, Mersin, Turkey
Paléo – Paléo. Revue d'Archéologie Préhistorique, Les Eyzies, France
Peuce – Peuce, Studii și cercetări de istorie și arheologie, Institutul de Cercetări Eco-Muzeale, Tulcea
Pontica – Pontica. Studii și materiale de istorie, arheologie și muzeografie, Muzeul de Istorie Națională și Arheologie Constanța
Quartär – International Yearbook for Ice Age and Stone Age Research
RCRFAcra– Rei Cretariae Romanae Fautorum
RE – Realenzyklopädie: Paulys realenzyklopädie der klassischen Altertumswissenschafts, Stuttgart, 1893
RI – Revista Istorică. Academia Română, Institutul de Istorie „Nicolae Iorga”, București
RESEE – Revue des Études Sud-Est Européennes. Academia Română, Institutul de Studii Sud-Est Europeene, București
RevBistr – Revista Bistriței. Complexul Muzeal Bistrița-Năsăud, Bistrița
SAA – Studia Antiqua et Archaeologica, Iași
SCIV(A) – Studii și Cercetări de Istorie Veche (și Arheologie), București
SlovArch – Slovenská Archeológia, Nitra
SMMIM – Studii și Materiale de Muzeografie și Istorie Militară, București
SP – Studii de Preistorie, București
Suceava – Suceava. Anuarul Muzeului Bucovinei, Suceava
Th-D – Thraco-Dacica, București
Transylvanian Review – Transylvanian Review. Centrul de Studii Transilvane, Cluj-Napoca
Tyragetia – Tyragetia. Anuarul Muzeului Național de Istorie a Moldovei, Chișinău
VT – Vetus Testamentum