

Traceological study of Lithic artefacts from the Mayaki settlement (Usatovskaya culture)

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Abstract. Currently, the processed lithic collection from the Eneolithic Mayaki settlement of Usatovskaya culture stands at 3793 specimens. Among these, during the typological analysis a group of flakes with use retouch was identified. In order to clarify their importance and role in the production process, this group of artefacts was subjected to traceological analysis. We were able to identify several implements with clear traces of use-wear, suggesting that such tools were associated with processing hard organic materials.

Key words: Mayaki settlement, Usatovskaya culture, traceology, flint artefacts with use retouch.

Studiul traseologic al pieselor din silex din aşezarea Mayaki (cultura Usatovskaya). Colecția de piese cioplite din silex provenită din aşezarea eneolitică a culturii Usatovskaya Mayaki se ridică momentan la 3793 de exemplare. În urma analizelor tipologice, a fost identificat un grup de aşchii cu reţuşe de utilizare. Pentru a clarifica importanța și rolul lor în procesul de producție, acest grup de piese a fost supus unei analize traseologice. Au fost identificate mai multe unelte cu urme clare de uzură, sugerând faptul că aceste unelte au fost folosite la prelucrarea materialelor organice dure.

Cuvinte cheie: aşezarea Mayaki, cultura Usatovskaya, traseologie, instrumente de silex cu reţuşe de utilizare.

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The Mayaki settlement, assigned to the Eneolithic Usatovskaya culture, is located on the south-eastern outskirts of the village Mayaki (Odessa district, Odessa region), on the plateau located on the left bank of the Dniester River (Zbenovich 1971, p. 193). The settlement was discovered in 1961 by the West-Scythian expedition of the Institute of Archeology of the Academy of Sciences of the USSR, under the leadership of A. I. Melyukova. The first investigations were carried out by

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V. G. Zbenovich on an area of about 500 m². During these investigations, it was established that the settlement includes a complex system of moats with various dimensions, filled with cultural remains (Zbenovich 1971, p. 194-195; 1974, p. 22-31). Subsequently, research on the site has been resumed under the guidance of E. F. Patokova and V. G. Petrenko (Patokova *et alii* 1989) focusing on the settlement and the adjacent burial ground. Similar sites of the Usatovskaya culture (Usatovo-Bolshoi Kuialnik, Maiaki) were interpreted as ritual centres (Petrenko 2013, p. 171).

During the latest excavations conducted in the settlement, a large number of ceramic products specific to the Usatovskaya culture (vessels and small figurines) was discovered, as well as metal, stone and bone artefacts.

In addition, a large collection of knapped flint was unearthed (Patokova *et alii* 1989; Pistrui 2021). At the moment, the flint collection of the Mayaki settlement, put together following the excavations conducted at the end of the 20th century and the beginning of the 21st century, comprises 3793 specimens. The flint collection contains a significant series of whole and knapped pebbles and debris, which measure from 2 cm to 10 cm, but the vast majority are 4-6 cm (Pistrui 2021, p. 171). That kind of raw material is not of very good quality, it was extracted from alluvial deposits of the Dniester, and was reported in the first publications. A significant quantity of raw material could be explained by the proximity of its source (Zbenovich 1974, p. 56). All stages of the knapping process were conducted on site, from primary knapping to fine retouching. This assertion is proved by a fairly large amount of flint material, primary knapping products and prepared implements with secondary treatment.

Among the formal implements and retouched items, various types of scrapers prevail. Apart from the scrapers, the collection contains chisels, push-planes, trapezes, retouched blades and flakes, as well as truncated blades. Other types of retouched artefacts and/or formal implements (such as points, fragment of a bifacial point, “kukrek type” insert etc.) are represented by single specimens (Pl. 1) (Pistrui 2021).

Following the typological analysis, a group of flakes with use retouch was identified (49 items). In general, the flakes are medium-sized (1.5-3 cm – 33 items). Large items (more than 3 cm) are infrequent (12 items) and only four specimens were represented by very small, fragmented flakes.

To this category we assigned items which present small retouch and/or minor polish located on different parts of the edge, on the dorsal and/or ventral sides, as well as a small number of flakes with highly irregular retouch. As expected, the retouch on these flakes was formed as a result of intentional and/or unintentional human activity. In some cases (e.g., small retouch on separate parts of the fracture), the specific traces could have been formed as a result of short-term work on hard materials.

Nº	Operation	Type	Quantity
1.	Smoothing/Planing	Planer knife	3
2.	Cutting grass	Plant cutter	1
3.	Groove cutting	Cutting tool	1
4.	Scraping	Scraper	2
5.	Dual function (retouching/scarping)	Retoucher on push-planer	1
6.	Brief use traces		7
	All		14

Table 1. Results of traceological analysis on flint tools with use retouch
Tab. 1. Rezultatele analizei traseologice a uneltelor de silex cu retușe de utilizare

In other cases (e.g., flakes with irregular retouch), we might be in fact dealing with waste material derived from rejuvenation of previously retouched implements (Pl. 2). We do not exclude that some of these represent accidental damage on flakes (which might have happened in prehistory or even in later times), which led to the unintentional retouching of different parts of the flakes. We decided to verify these preliminary conclusions through use-wear analysis. To identify the traces of use-wear, we used the reference collection of implements, obtained as a result of a series of experiments held at the base of Anetovskaia Paleolithic expedition (Hrytsiuta 2021).

All 49 flakes with use retouch were studied under the binocular microscope MICROmed ZOOM SM-6630 using x7-x45 magnifications. Clear use-wear traces were found on 14 items (Table 1). Among these we manage to identify three implements which have similar features. They have two working edges situated on the side margins, convergent to each other (Pl. 3/1a, 1b, 1c). Both edges are sharp and have a use retouch. They are slightly denticulate, with a V-shaped profile and fractured, shallow removal negatives mostly located on ventral side. The polish, with a bright and spotted aspect, is also situated on the ventral part. Although in general the polish is not very evident, it does appear more pronounced on the very edge of the item. Traces in the form of scratches angled 45° relative to the working edge were found on the ventral side (Pl. 3/1). Based on the characteristics and location of these traces, we can assume that the items described here were used for smoothing (leveling) hard organic materials.

Another implement selected for this study is characterized by the presence of one working edge, located on the distal end (Pl. 3/2b). The use retouches were observed along this working edge, with scars located on both sides, giving a slightly denticulate aspect to the edge. The polish is poorly expressed, except one small area, where the polish is bright and has a clear boundary, and it does not intrude into the retouch scars. The protruding edges of the facets are polished (Pl.

3/2a). Traces in the form of glaze were found on the opposite side of the working edge, which could be interpreted as hafting remains or traces from hand holding (**Pl. 3/2**). The nature of the use-wear traces indicates that this implement was used as a cutting tool for hard organic materials.

The next implement (**Pl. 3/3a**) has one sharp working edge, with a V-shaped profile. The intensity of use-wear is average. On the edge there are a few removal negatives from both sides, with shallow and sparse scars. The polish is bright and glossy, situated on both sides of the edge. On the ventral side, the polish goes deeper into the implement, approximately 0.5-0.7 cm. Based on its characteristics, it corresponds to plant polish (**Pl. 3/3**), and therefore we can assume that this implement was probably used as a grass cutter.

The following implement has a broken proximal end, while the distal end presents traces suggesting it was used as a retoucher (**Pl. 4/1b, 1a**). The implement has two working edges on the sides, both with use-wear, one of which has an irregular and multi-layered aspect, that was most likely formed as a result of intensive work on hard material (**Pl. 4/1**). In our opinion, this implement performed a dual function – retouching and scraping a hard organic material.

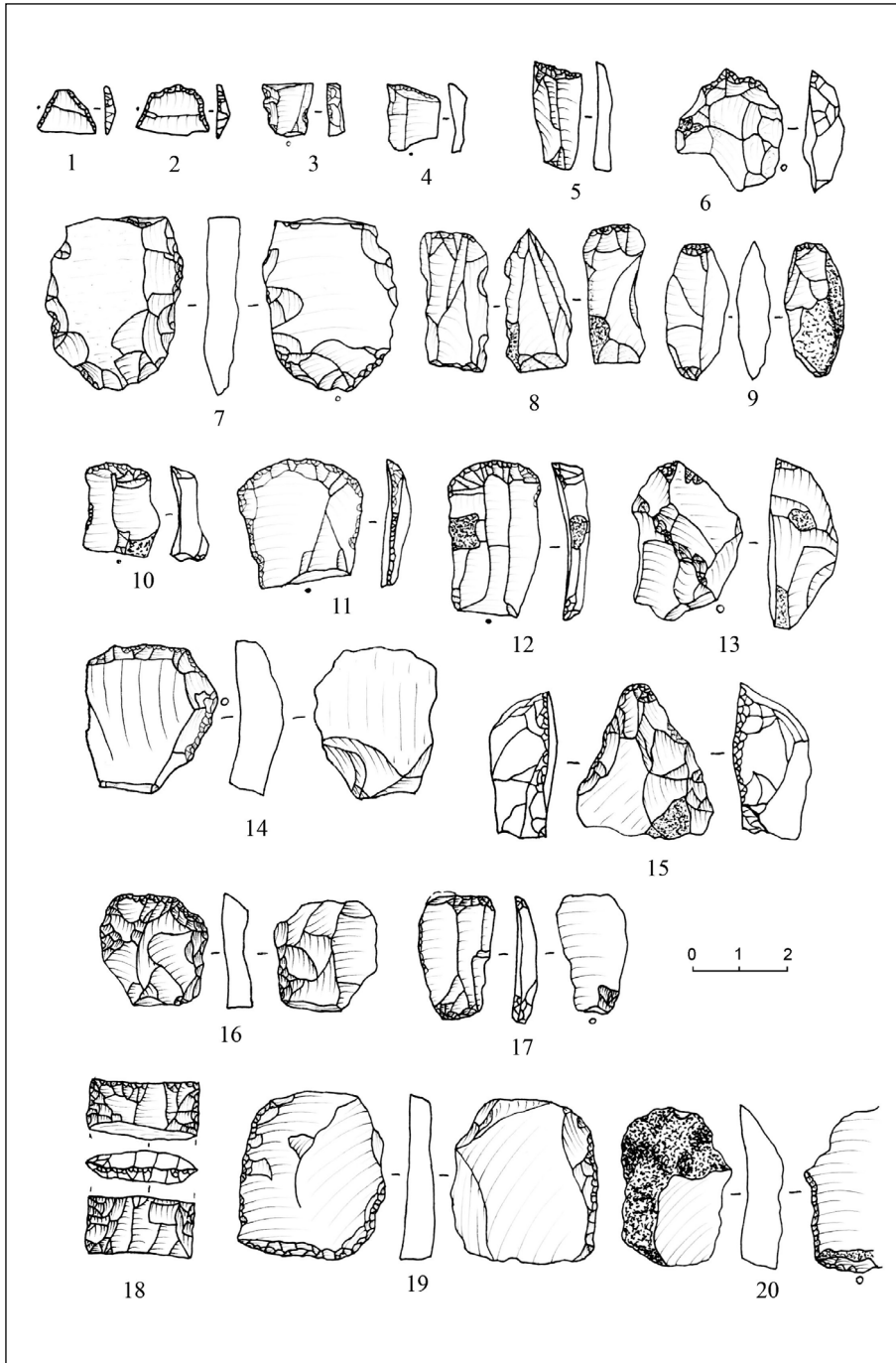
The last implement with consistent traces is represented by a fragmentary flake (**Pl. 4/2a**). The working edge is partly preserved on a length of approximately 0.6 cm. The working edge is rounded and polished. The polish is located on the narrow strip at the very edge of the flake. The protruding parts of the edge, which are covered by bright polish, are fused. It can be assumed that we are dealing with a broken scraper or push-plane used for smoothing hard organic materials (probably wood) (**Pl. 4/2**).

Among the studied materials we managed to also select a group of artefacts (seven items) with traces of brief use. These include two medium-sized (1.5-2 cm) flakes (**Pl. 4/3a, 3b**) with denticulate working edges. There are no use-wear traces on the sides of the working edge, except for bright stripes of polish at the very edge (**Pl. 4/3**). Perhaps this indicates the use of these implements for short-term operation of sawing/cutting. Also, to this group we can add flakes with light use-wear traces in the form of irregular, mottled polish, visible in some areas along the edge (**Pl. 5/1-4**). One of the implements from this group is represented by a flake with use retouch, which was rolled (**Pl. 5/5a**). After examination under the microscope we could not determine the cause of its rolled appearance. Since there are no obvious traces of non-utilitarian wear, probably it was the result of long term underwater immersion. Perhaps the implement belonged to earlier cultures, and then spent a long time in the water. Later on, the artefact was brought to the settlement, but not used further (**Pl. 5/5**).

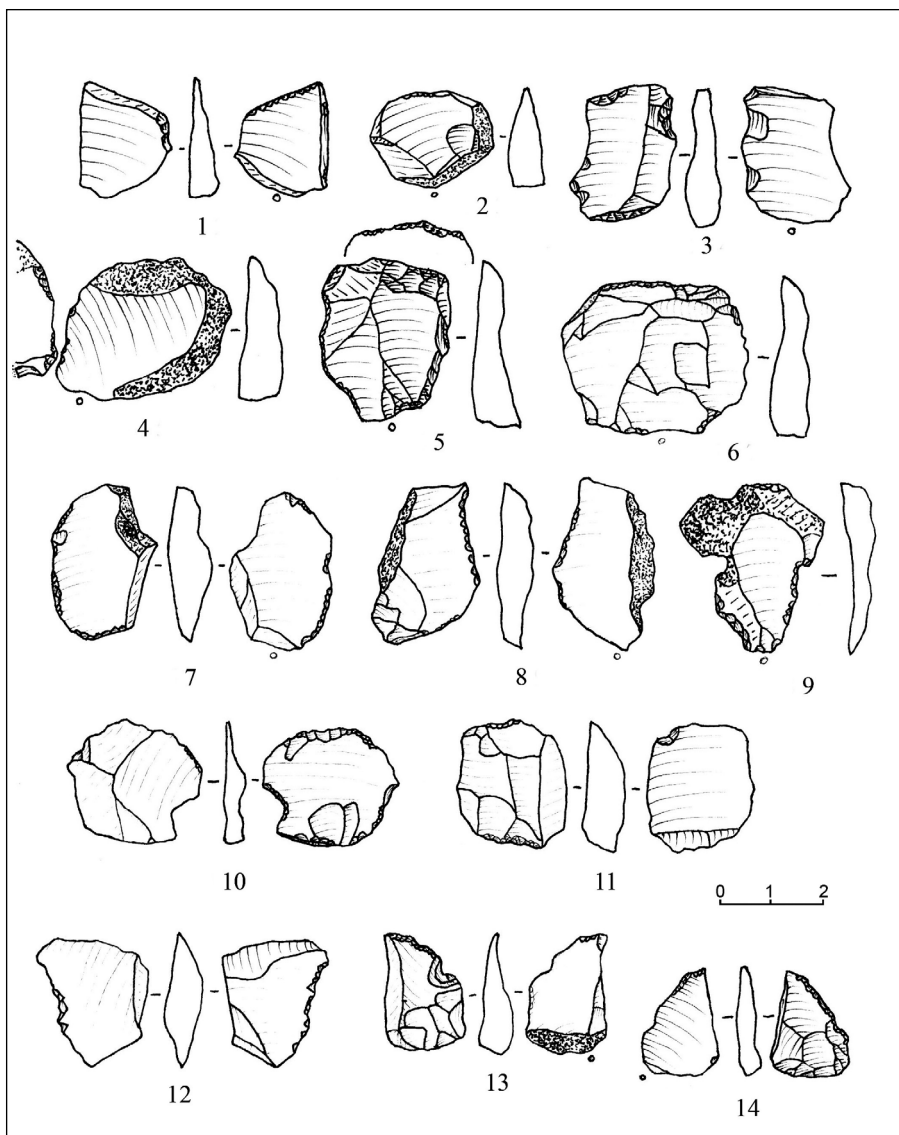
The use-wear analyses of a set of flakes with use retouch provide interesting information about their importance in the production processes within the Mayaki settlement. In general, the use-wear traces are not evidently expressed and the polish, located in separate areas, is not uniform. Striation traces were found on only a few specimens. Based on these observations, we can assume that such traces may indicate the short lifespan of this category of implements. Nevertheless, we do not exclude that some of the traces are, in fact, unintentional damage. In our opinion, this category of implements played an auxiliary role and was used opportunistically.

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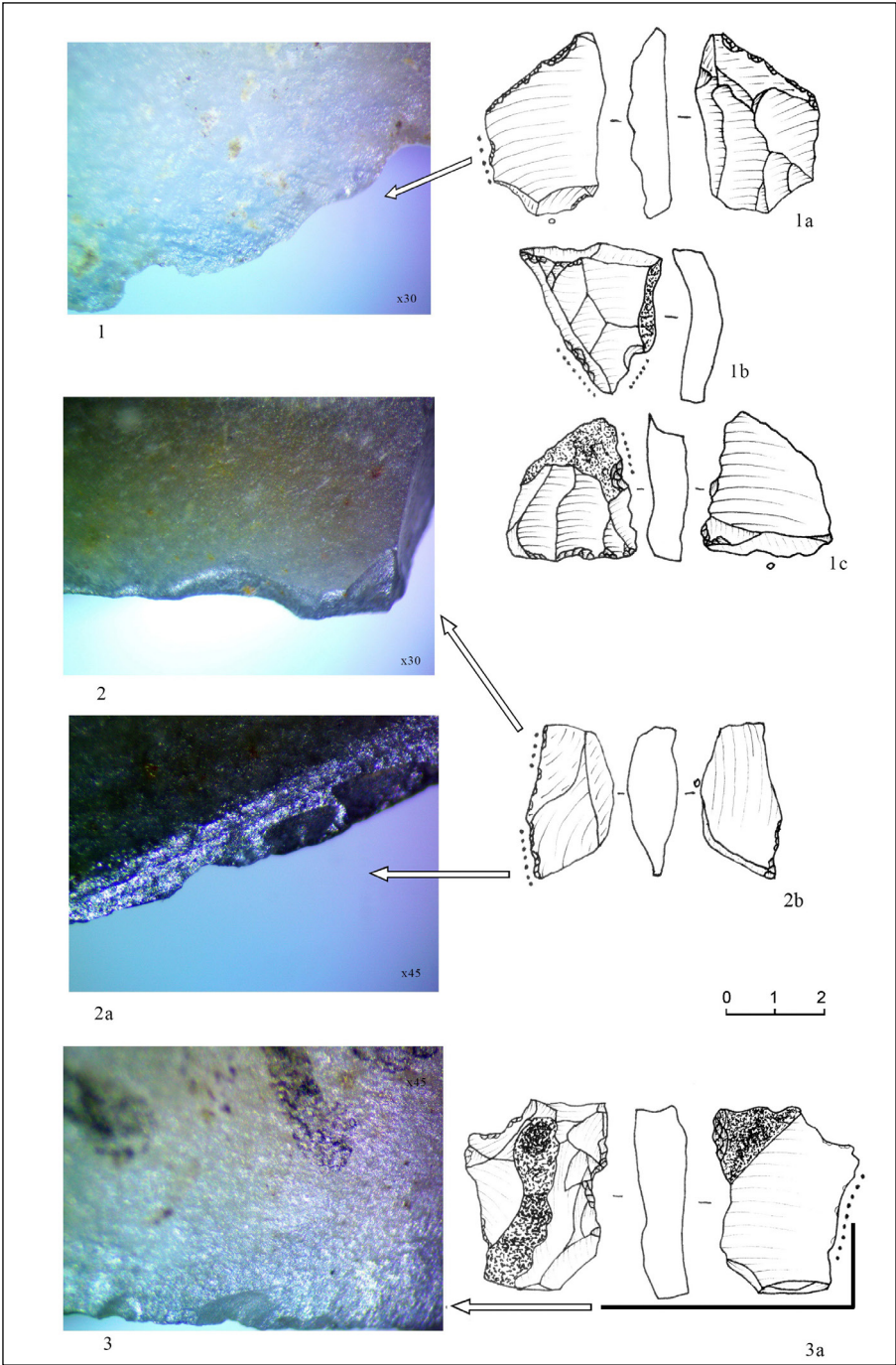
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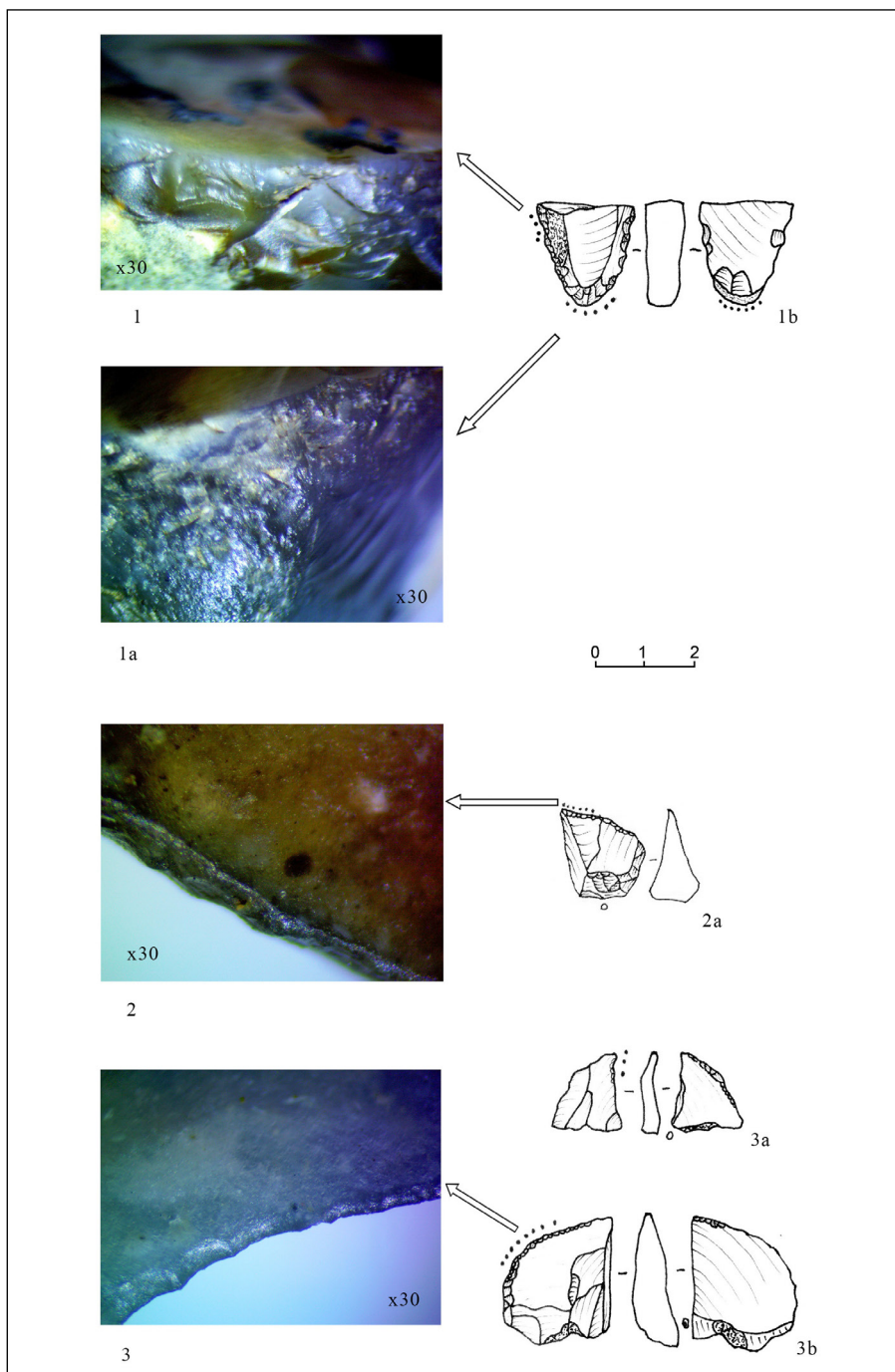
Pl. 1. Flint tools of the Mayaki Eneolithic settlement of the Usatovskaya culture
 Pl. 1. Unelte de silex din așezarea eneolitică Mayaki, cultura Usatovskaya



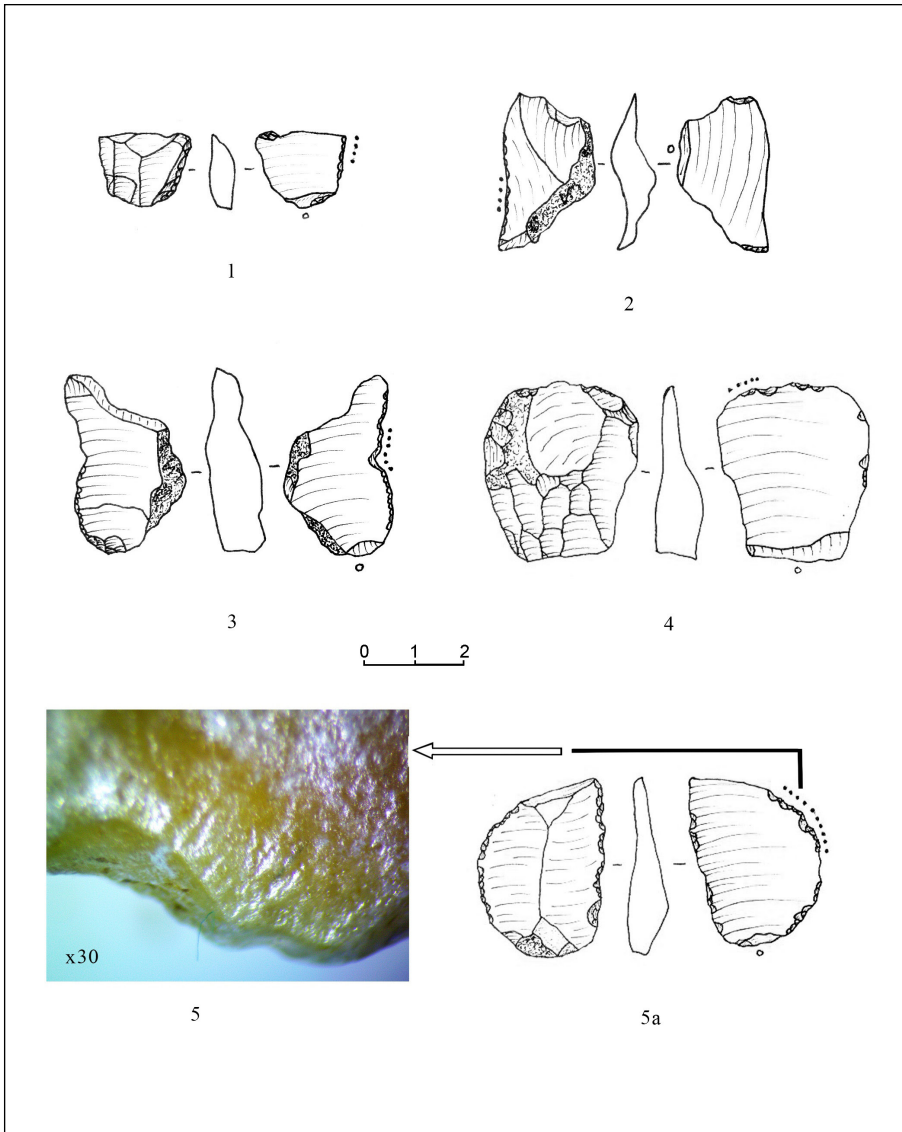
Pl. 2. Flakes with use retouch
Pl. 2. Așchii cu retușe de utilizare



Pl. 3. Flint tools with use-wear traces
Pl. 3. Unelte de silex cu urme de uzură



Pl. 4. Flint tools with use-wear traces
Pl. 4. Unelte de silex cu urme de uzură



Pl. 5. Flint tools with use-wear traces
Pl. 5. Unelte de silex cu urme de uzură