Přehled výzkumů 67/1, 2026 ● 11–45

Sites with multiple settlement in the Stone Age near the Zemplín Hills

Lokality s viacnásobným osídlením v dobách kamenných z okolia Zemplínskych vrchov

– *Ľubomíra Kaminská** –

KEYWORDS

Zemplín Hills – Middle Palaeolithic – Upper Palaeolithic – Neolithic/Eneolithic – chipped lithic industry – leaf points – Aurignacian – Epigravettian – surface collections

ABSTRACT

The chipped lithic industry from the territory west of the Zemplín Hills (Zemplínské vrchy) comes from surface collections and belongs to multiple Palaeolithic and post-Palaeolithic cultures. However, precise stratigraphic documents are lacking. The industry was evaluated on the basis of the techno-typological analysis and the composition of the raw materials. The Middle Palaeolithic industry with leaf points belonging to the Late Mousterian from the sites of Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A and Čerhov II – Pod Hečkou B is the earliest. What is particularly noteworthy is the Upper Palaeolithic industry with carenoid and nosed scrapers from the sites of Luhyňa I, Luhyňa II, and Veľaty III, which is associated with the Middle Aurignacian. Industry from the Neolithic/Eneolithic up to Early Bronze Age was discovered at Veľká Tŕňa – Hečka, Luhyňa I and Veľaty III and included obsidian arrowheads with surface retouch.

* Corresponding author – E-mail address: kaminska@saske.sk

https://doi.org/10.47382/pv0671-05

Received 3 December 2025; received in revised form 27 April 2026.
Available online 29 June 2026.

Competing interests: The authors have declared that no competing interests exist.

1. Introduction

Archaeological monuments from the territory of the Zemplín Hills (Zemplínske vrchy) document its settlement since the Stone Age. It was a sought-after territory thanks to the raw material resources, favourable natural conditions and the relief allowing exploitation of the raw material sources from the territory of the lowland as well as the forest environment.

The article deals with selected sites from the area of the western part of the Zemplín Hills to the Roňava River, which creates the border with Hungary. We can mention various sites in the cadastral areas of the villages of Veľká Tŕňa, Čerhov, Luhyňa and Veľaty. Many sites are located at favourable areas which were repeatedly used. This resulted in polycultural sites with chipped lithic industry. However, no pottery sherds were found at any of them (Fig. 1).

Information on the settlement in the western part of the Zemplín Hills was first published by Š. Janšák (1935, 67, mapa 14). Among others, he was interested in the cadastral areas of the villages Veľká Tŕňa and Malá Tŕňa. He focused on collections exclusively on the eastern periphery of the Zemplín Hills' foothills. The space of the western periphery of the villages and further to the west, as far as the border with Hungary, or further to the north to the Slanské Hills (Slánske vrchy), remained unmonitored.

During collections in the area of the Zemplín Hills, K. Andel (1955) discovered industry which he identified as Palaeolithic; he found neolithic industry in the cadastral area of Malá Tŕňa. However, the sites were located closer to the foothills of Zemplín Hills. The sites like Čerhov, Veľká Tŕňa, Veľaty or Luhyňa are not mentioned in association with finds from the Palaeolithic–Neolithic. Several decades later, another collector – I. Smatana – carried out investigations of older as well as more recent sites, mainly in the cadastral area of Veľaty. The material which he collected at the site of Veľaty III is analysed in this article.

Our own investigations discovered relics from the Stone Age in the cadastral areas of Malá Tŕňa, Veľká Tŕňa and Veľaty (Kaminská 1985; Kaminská, Cheben 1983).

After 2000, repeated surveys are associated with M. Ilʼko, then a student of History at the Faculty of Arts at the University of Prešov. He focused on Čerhov and the neighbouring villages of Luhyňa and Veľká Tŕňa. The finds were concentrated and administered by M. Vizdal at the Institute of History of the University of Prešov. After M. Vizdal had retired, he gave us several Palaeolithic to Eneolithic finds for processing. Some lithic artefacts were published by History graduate A. Voľanská (2016).

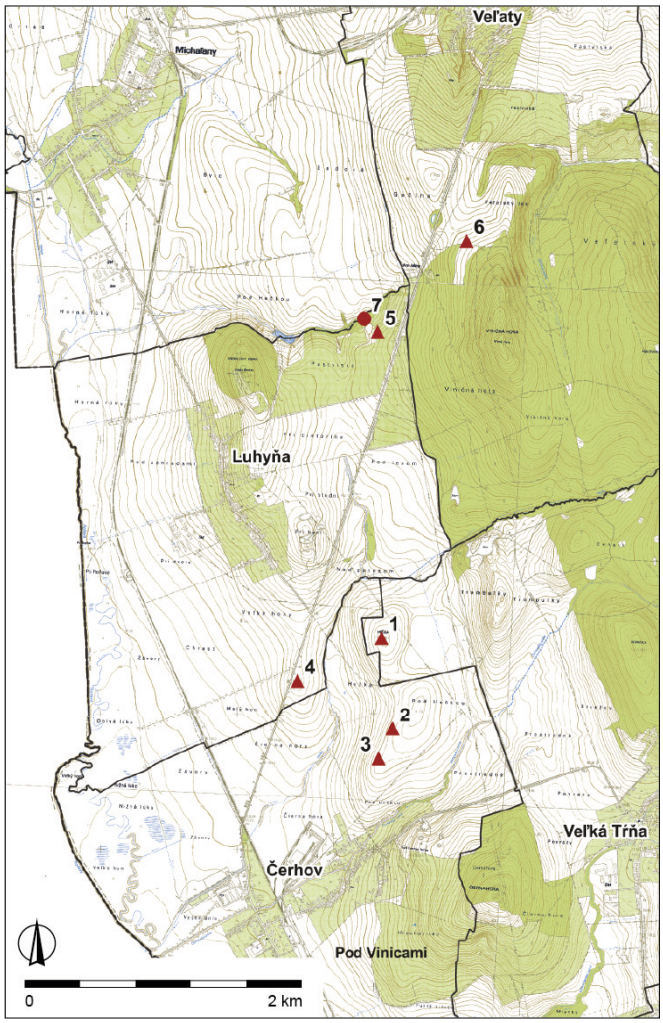

Fig. 1. Map of the western part of the Zemplín Hills with localities: 1 – Veľká Tŕňa – Hečka; 2 – Čerhov II – Pod Hečkou A; 3 – Čerhov II – Pod Hečkou B; 4 – Luhyňa I; 5 – Luhyňa II; 6 – Veľaty III; 7 – Luhyňa, source of opals/chalcedony. Authors Ľ. Kaminská, P. Sopko.

Obr. 1. *Mapa západnej časti Zemplínskych vrchov s lokalitami: 1 – Veľká Tŕňa – Hečka; 2 – Čerhov II – Pod Hečkou A; 3 – Čerhov II – Pod Hečkou B; 4 – Luhyňa I; 5 – Luhyňa II; 6 – Veľaty III; 7 – Luhyňa, zdroj opálov/chalcedónov. Autori Ľ. Kaminská, P. Sopko.*

2. Geology of the area and sources of the lithic raw materials

The investigated region is located in the territory of lowland hills and it is outlined by the Zemplín Hills in the east. The Eastern Slovak Hills (Východoslovenská pahorkatina) reach as far as the Slanské Hills in the west and are connected to the Eastern Slovak Flat (Východoslovenská rovina) (Atlas 1980, 54–55). Quaternary sediments consist of loess loams/loesses, mainly from the final glacial period, as well as fluvial sediments of low terraces. On the left bank of the Roňava River, there is a flat accumulation landscape with old aggradation mounds with mycelial carbonate chernozems, and forest-steppe. Further to the east, there is a hilly accumulation-erosion landscape with loess hills and brown earth to clay illuviated soils and thermophilic oaks.

Along with the predominant Upper Palaeolithic rocks, Tertiary volcanic rocks (Neogene volcanites) comprise the geological composition of the territory of the Zemplín Hills. Volcanic activity in the region started in the Early Badenian and continued until the Pannonian. Products of this activity are part of the Kochanovce and Tokaj stratum. Volcanic products are widespread on the surface mainly on their northeastern and southwestern peripheries, where they form volcaniclastic rock positions, lava flows, extrusive and dike bodies of andesite, rhyodacite and rhyolite composition. Redeposited volcaniclastic rocks, mostly tuffs and tuffites, mainly rhyolite composition, are often transformed into bentonite (Kobulský et al. 2014, 10). Bentonite deposits are known from the cadastres of the municipalities of Veľaty, Michaľany, Kuzmice, Brezina and Byšta (Ďuďa et al. 1985). During the authigenic transformation of volcanic glass in rhyolite tuffs, the released/excess SiO_2 is deposited in bentonites in the form of opal, chalcedony or other low-thermal forms of SiO_2, or it migrates to the marginal parts of bentonite deposits.

Opal usually forms in cracks and cavities of volcanic rocks as a low-temperature form of SiO_2 (Ďuďa, Ozdín 2012, 298–308). Limnosilicite is a sedimentary-chemogenic rock/mineraloid and is usually part of intravolcanic basins or occurs in the marginal parts of shallow lakes, where volcanic rocks are present in the immediate vicinity or wider environment. It is composed of several minerals, mainly quartz and opal and their varieties, as well as cristobalite and tridymite. Often in this environment other sediments are also silicified – clays, volcaniclastic rocks, etc. (Ďuďa, Ozdín 2012, 251).

The best-known sources of opal from the nearby surroundings of the examined region are found in the Slanské Hills. Opals there occur in various colours – yellow-white, yellow-brown, ochre, green-brown, striped, grey, grey-blue, etc. The Slanské Hills are also a source of expensive milky opal and glass opal. In addition to their massive texture, there is also lumpy and fluid, or even striped texture (Ďuďa 1996).

Limnosilicites and jaspers occur alongside opals, especially in the Slanské Hills. Vegetal remains are typical in the content of limnosilicites. They are macroscopically visible also in various colour varieties. Their structure documents association between limnosilicites and opals and chalcedony (Mišík 1975; Přichystal 2009, 112, 133).

2.1 Opals/chalcedony

Opals/chalcedonies are found in the part of the stream dividing the cadastral areas of Veľaty and Luhyňa (Fig. 1: 7; 3: 2). They originally outcropped and were accessible in pits in the form of veins, cortexes and nodules. In the past, it was possible to extract them from the pits; today, the stream banks are covered with soil and it is more difficult to find sources.

2.2 Obsidians

The Zemplín Hills are the best-known territory with the occurrence of obsidians, which were heavily used in the Stone Age. Obsidians are a result of rhyolite volcanism. Primary as well as secondary sources are located in the area of the Zemplín Hills.

Primary sources of obsidian can be found in the peripheral parts of the extrusive rhyolite body near Malá Bara and in several places in the cadastral area of Viničky. More detailed results of investigation and K/Ar dating have been published, related to these occurrences (Bačo et al. 2017).

Obsidians are found in their perlitic glassy parts. From those, they weathered into eluvial/diluvial deposits (Bačo et al. 2017, 215, Fig. 9). Obsidians from an identical environment are also found in vineyards near cellars (Bačo et al. 2017, Fig. 7: 2–3; 8). Currently found obsidian nodules reach sizes of 10–14 cm, although they are mostly smaller. The surface of obsidians is usually smooth. However, initial sculpture in the form of a rough surface and small dimples occurs on some exemplars (Bačo et al. 2017, Fig. 10; 11c). No distinct sculpture on the

surface of obsidians known from archaeological sites has been detected. Fluidal texture is visible on thin obsidian flakes from Viničky (Kaminská, Ďuďa 1985, 122; Kaminská 1991; Bačo et al. 2017, 216).

A secondary source of obsidians with sculpture was discovered in the fields southeast of the crossroads of Zemplín – Cejkov – Brehov (as far as the Ošva River), corresponding to the sites presented by Š. Janšák (1935, 56) as the area of frequent occurrence of obsidian. The site southwest of Brehov, in the cadastral area of Cejkov, called Cejkov – Žihľavník (Přichystal, Škrdla 2014, 219) or Cejkov – Malé lúky – Žihľavník (Bačo et al. 2017, 219) is crucial. They are currently covered by drifted sands or clays (Přichystal, Škrdla 2014, 217). It is assumed that obsidians arrived in the relevant area from the primary source as washed sediments or as part of gravel-sand deposits of local rivers.

Secondary sources of obsidian in the area of Brehov – Cejkov – Zemplín spread over an area of approx. 6 km^2 (Přichystal, Škrdla 2014, 224). They represent a newly detected source of the raw material used for the production of obsidian industry. Its primary site is probably found under andesites at Veľký vrch near Brehovo (Bačo et al. 2003; Přichystal, Škrdla 2014, 217; Bačo et al. 2017, 224).

Obsidian from the sources near the Zemplín Hills is indicated as Carpathian variant 1 (Williams-Thorpe et al. 1984). Carpathian variant 2 refers to obsidians from the Tokaj Mountain range in northeastern Hungary (Biró 1984) and Carpathian variant 3 comes from the Velikyi Scholles Ridge in Transcarpathian Ukraine (Rácz 2013).

3. Archaeological sites

Chipped lithic industry from the Palaeolithic, Neolithic/Eneolithic and from the Early Bronze Age was found at sites recently discovered by M. Il'ko at Veľká Tŕňa – Hečka site, Čerhov II – Pod Hečkou A and B sites, Luhyňa I, and by I. Smatana at Veľaty III. We discovered the Luhyňa II site in 2023. The lithic industry was collected on the topsoil and it belongs to archaeological cultures of various periods (Fig. 1–3).

Certain discrepancies occur in terms of exact localisation of the finds. There are several sites in Čerhov. Čerhov I – Pod Vinicami site, is situated on the southern periphery of the village. Obsidian industry, which will be processed in another article, mostly comes from the Neolithic and Eneolithic. Palaeolithic artefacts do not occur there. Adriána Voľanská (2016, Fig. 3, Table 1.3.) reports one flint leaf point from this site. However, according to the finder, it comes from the site of Čerhov II – Pod Hečkou. Further in the text she only mentions the sites of leaf points as Veľká Tŕňa – Hečka and Čerhov – Pod Hečkou (Voľanská 2016, 10). It cannot be verified, as this artefact is missing in the assemblage of finds.

3.1 Veľká Tŕňa, Hečka site

There is mildly undulated landscape with adjacent hills divided by a small saddle which is indicated as the site of Hečka in the cadastral area of Veľká Tŕňa and Pod Hečkou site in the cadastral area of Čerhov. From the north, it is enclosed by the Hečka Stream and in the south, there is the Čerhovský Stream (Čerhovský potok). Both streams flow into the Roňava River west of the sites, on the border with Hungary. The view from Hečka westwards sees the Roňava River, the Slanské Hills and the Tokaj Hills in Hungary. The peak of Hečka Hill is 169 m a.s.l. Industry was discovered in the topsoil on the southern slope below the peak (Fig. 1: 1; 2). The Hečka site is currently used as arable land. Repeated collections from the topsoil obtained a small aggregate of lithic industry belonging to several archaeological cultures. No pottery was discovered.

3.1.1 Technological-typological composition of industries

The assemblage of chipped industry contains 32 specimens. With regard to raw materials, technological and typological composition, they are divided into three groups. Group 1 comprises 18 artefacts, including a leaf point. It belongs to the Middle Palaeolithic. Group 2 contains six artefacts and belongs to the Epigravettian. Eight artefacts were classified into the Neolithic/Eneolithic.

Middle Palaeolithic

The group contains 18 artefacts. It consists of three cores, 12 flakes and three tools (Tab. 1). The finds should include a flint leaf point (Fig. 1: 8 – Voľanská 2016, Fig. 3: 1). With the exception of a single tool from radiolarite, all artefacts are made from opal/chalcedony.

Opal/chalcedony is a raw material of varying quality. At the nearest source in Luhyňa, there are exemplars of various sizes (10 cm on average), with cracks and different inhomogeneities. Less glassy chunks represent a more solid mass usable for reduction of flakes. Chunks of raw material of uneven quality were also used at this site. The surfaces of the artefacts have differing degrees of white patina.

Raw material

Technological groups	Opal/chalcedony	Radiolarite	Σ	%
Core	3		3	16.67
Flake	12		12	66.66
Tool	2	1	3	16.67
Σ	**17**	**1**	**18**	**100.00**

Tab. 1. Veľká Tŕňa – Hečka. Middle Palaeolithic. Composition of the collection according to technological composition and raw material.

Tab. 1. *Veľká Tŕňa – Hečka. Stredný paleolit. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

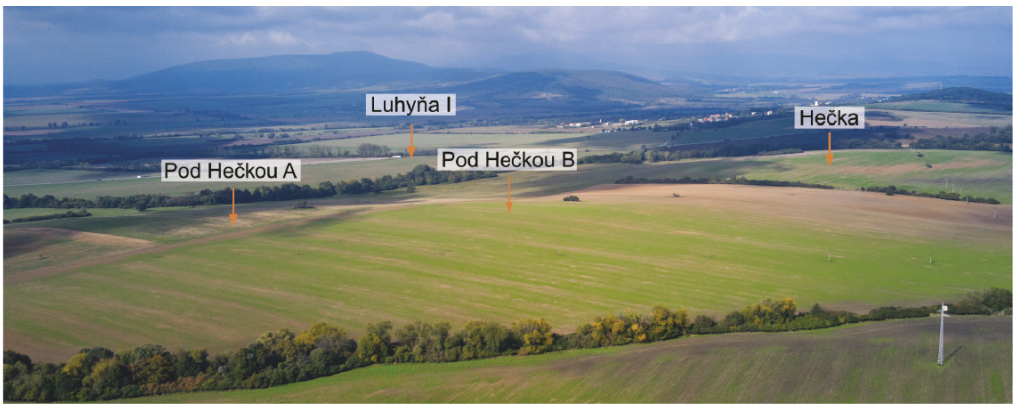

Fig. 2. View of the sites Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B, and Luhyňa I from the southeast. Photo by H. Gula.

Obr. 2. *Pohľad na lokality Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B a Luhyňa I od juhovýchodu. Foto H. Gula.*

Fig. 3. View of the sites from the northeast: 1 – Luhyňa II; 2 – Luhyňa, source of opals/chalcedony. Photo by H. Gula.

Obr. 3. *Pohľad na lokality od severovýchodu: 1 – Luhyňa II; 2 – Luhyňa, zdroj opálov/chalcedónov. Foto H. Gula.*

Cores represent chunks of raw material in the initial stage of preparation. Negatives after reduction of several flakes point to the discoidal method. Two of them are small, with dimensions of 36 × 34 × 15 mm and 30 × 30 × 20 mm, one of them is large – 57 × 59 × 20 mm. Numerous cracks on the material made reduction of larger flakes which could be used for making tools impossible. The flakes are short, wide and considerably thin. Butts were preserved only on three of them; they were dihedral, faceted, and flat. Most flakes occur without cortex. There is only one completely and two partly covered with cortex.

Only three tools were discovered. The most important tool is a bifacial retouched leaf point from patinated opal, with dimensions of 47.8 × 26.4 × 9.3 mm (Fig. 4: 1a, b). The maximum width is below the mesial part of the tool. The point tip bears traces of impact. Transversal cross-section of the point is biconvex, as is the longitudinal cross-section.

The second tool is an endscraper on a flake from the lateral part of a red-brown radiolarite pebble with the original cortex (Fig. 4: 5). The tool has strong lateral retouch on both edges. The last tool is retouched flake made from opal/chalcedony (Fig. 4: 7).

Upper Palaeolithic, Epigravettian

Some artefacts are classified into the Epigravettian. They include six exemplars of industry (Tab. 2). Five of these artefacts are chipped from local obsidian and one comes from erratic silicite. There is a core, two flakes, and three blades.

The core comes from the initial stage of exploitation which began on the narrower side of the obsidian nodule with sculpture (35 × 34 × 18 mm). Several flakes were reduced in the parallel direction (Fig. 4: 6). Two obsidian flakes have half of their surface covered with the original cortex.

The basal portion of a regular blade from pale-blue patinated erratic silicite has also been preserved. It was broken, probably during ploughing, when its right edge might have been damaged as well (Fig. 4: 4). The transversal profile of the blade is triangular, its base is smooth, with a ledge. Damaged edges and a broken base can also be seen on a massive obsidian blade (Fig. 4: 2). The central part of a slim obsidian blade was also discovered. The obsidian blades have slightly patinated surface and the damage was rather recent.

Raw material

Technological groups	Obsidian	Erratic flint	Σ	%
Core	1		1	16.67
Flake	2	1	3	50.00
Flake	2		2	33.33
Σ	**5**	**1**	**6**	**100.00**

Tab. 2. Veľká Tŕňa – Hečka. Epigravettian. Composition of the collection according to technological composition and raw material.

Tab. 2. *Veľká Tŕňa – Hečka. Epigravettien. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

Neolithic/Eneolithic

Eight Neolithic or Eneolithic tools were found. More exact classification into a particular culture is impossible as the tools are not specific and no pottery sherds were discovered. The artefacts were made from obsidian and limnosilicite. They include a small obsidian nodule without sculpture, three flakes, and four tools (Tab. 3).

Two obsidian flakes have the surface completely or partly covered with the original cortex; one of them also has a butt with cortex. They were reduced by a hard percussor, as was the limnosilicite flake with a flat butt.

As for tools, a short obsidian blade endscraper with an oblique front was found (Fig. 4: 3). From the two obsidian blades, one has been preserved complete, with retouched edges and a flat butt. The other one, with a retouched left edge, was broken. The flake with a notch was also made from obsidian.

Raw material

Technological groups	Obsidian	Limnosilicite	Σ	%
Core – nodule	1		1	12.50
Flake	2	1	3	37.50
Tool	4		4	50.00
Σ	**7**	**1**	**8**	**100.00**

Tab. 3. Veľká Tŕňa – Hečka. Neolithic/Eneolithic. Composition of the collection according to technological composition and raw material.

Tab. 3. *Veľká Tŕňa – Hečka. Neolit/eneolit. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

3.2 Čerhov II, Pod Hečkou site

The neighbouring hill, next to the site of Hečka in Veľká Tŕňa with altitude of 160 m a.s.l., belongs to the cadastral area of Čerhov. There are several sites in the cadastral area of Čerhov and this site called Pod Hečkou is indicated as Čerhov II. On the southern slope of the hill, below its peak, artefacts were collected from two concentrations indicated as A and B. It is possible that it is a single site from which ploughing transported artefacts to two places, as the distance between them is only 200 m down the slope. Pottery sherds were not found (or they were not collected?). Industry from both sites is not numerous, but contains several distinct artefacts whose analysis allowed their association with different cultures.

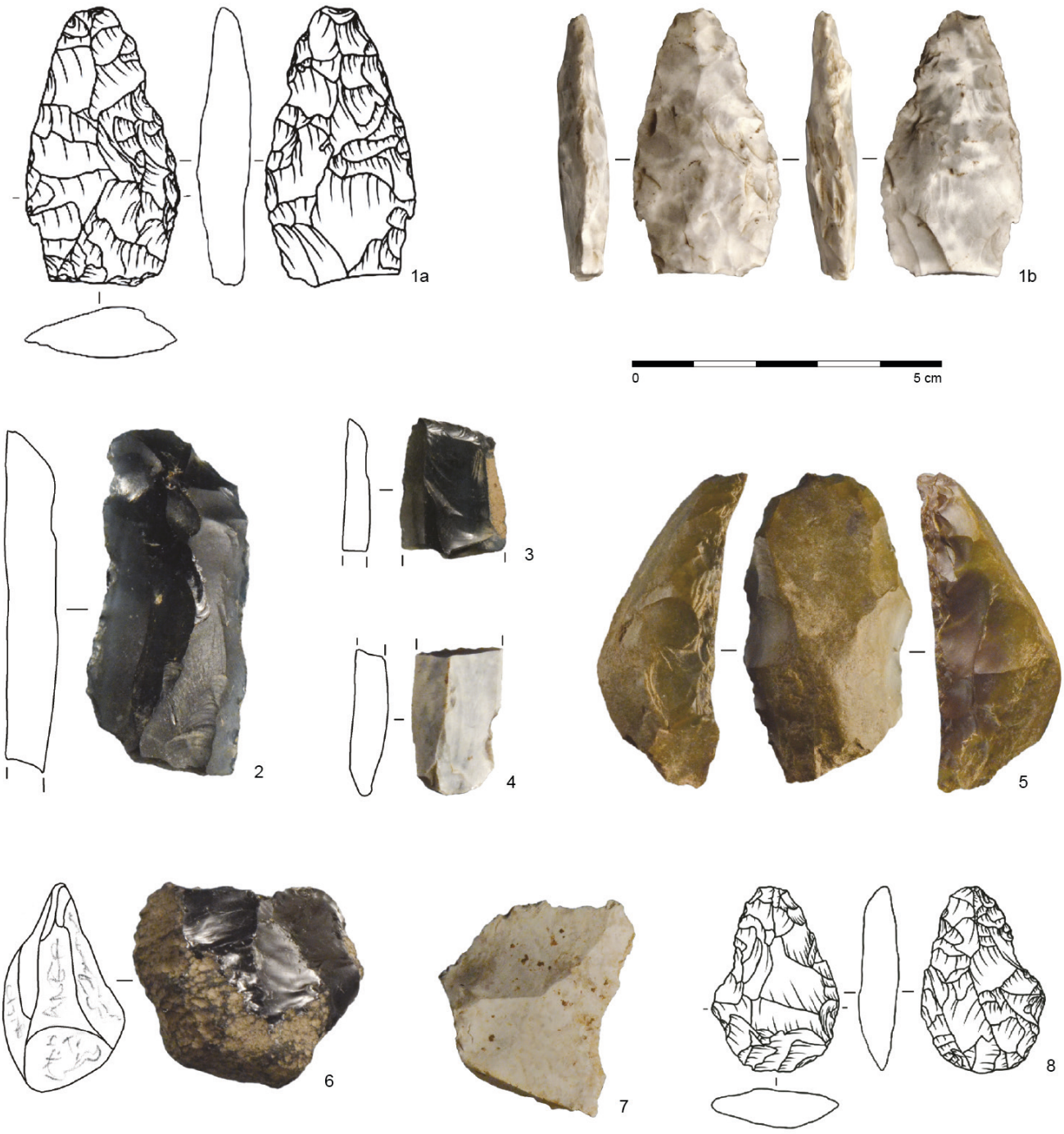

Fig. 4. Veľká Tŕňa – Hečka. Chipped stone industry. Middle Palaeolithic: 1a, b, 8 – leaf points; 5 – endscraper; 7 – retouched flake. Epigravettian: 2, 4 – blade; 6 – core. Neolithic/Eneolithic: 3 – blade endscraper. 1a, b, 7 – opal/chalcedony; 2, 3, 6 – obsidian; 4, 8 – erratic flint; 5 – radiolarite. Photo by A. Marková, drawing after A. Voľanská 2016, Fig. 3: 1, 4.

Obr. 4. *Veľká Tŕňa – Hečka. Štiepaná kamenná industria. Stredný paleolit: 1a, b, 8 – listovité hroty; 5 – škrabadlo; 7 – retušovaný úštep. Epigravettien: 2, 4 – čepeľ; 6 – jadro. Neolit/eneolit: 3 – čepeľové škrabadlo. 1a, b, 7 – opal/chalcedony; 2, 3, 6 – obsidián; 4, 8 – eratický pazúrik; 5 – rádiolarit. Foto A. Marková, kresba podľa A. Voľanská 2016, Fig. 3: 1, 4.*

3.2.1 Čerhov II, Pod Hečkou A site

Technological-typological composition of industries

The assemblage of industry composed of 73 artefacts comes from the site of Pod Hečkou A (Fig 1: 3; 2). The artefacts represent chipped industry from the Middle Palaeolithic and Upper Palaeolithic blade industry. Apart from them, one microlithic core from non-patinated chert was discovered; it could be classified into the Neolithic/Eneolithic.

Middle Palaeolithic

The chipped industry, 42 artefacts in total, was made from several raw materials (Tab. 4). Opal/chalcedony greatly prevails (37 pieces – 88.10%), it is followed by two exemplars (4.76%) from radiolarite. Flint, silicified sandstone, and jasper are represented by one exemplar (2.38%) each. Artefacts from opal/chalcedony have their surface covered with white patina of varying quality, often on the same exemplar. The raw material is of poor quality. Flakes sometimes occurred as a result of breaking of the raw material in its cracks or inhomogeneities.

Raw material

Technological groups	Opal/ chalcedony	Radiolarite	Erratic flint	Silicified sandstone	Jasper	Σ	%
Core – nodule	2				1	3	7.14
Flake	31					31	73.81
Tool	4	2	1	1		8	19.05
Σ	**37**	**2**	**1**	**1**	**1**	**42**	**100.00**

Tab. 4. Čerhov II – Pod Hečkou A. Middle Palaeolithic. Composition of the collection according to technological composition and raw material.

Tab. 4. *Čerhov II – Pod Hečkou A. Stredný paleolit. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

Raw material

Technological groups	Opal/ chalcedony	Radiolarite	Erratic flint	Silicified sandstone	Σ	%
Single convex sidescraper	1				1	12.50
Double convex-straight sidescraper		1			1	12.50
Splintered piece	1				1	12.50
Leaf point		1			1	12.50
Retouched flake	1			1	2	25.00
Tool fragment	1		1		2	25.00
Σ	**4**	**2**	**1**	**1**	**8**	**100.00**

Tab. 5. Čerhov II – Pod Hečkou A. Middle Palaeolithic. Composition of tools by type and raw material.

Tab. 5. *Čerhov II – Pod Hečkou A. Stredný paleolit. Zloženie nástrojov podľa typu a suroviny.*

The industry consists of cores, flakes, tools, and their fragments. Flakes and fragments are most frequent (31 exemplars, 88.10%). They are followed by eight tools and their fragments and three cores. Butts of the flakes are flat or covered with cortex. One of the larger flakes from radiolarite has the surface of a nodule shaped by water.

The discoid core is made from opal/chalcedony. Its dorsal part is covered with cortex of the raw material. Other artefacts are a fragment of a jasper core and a thin plate with several test strikes made from opal/chalcedony covered with cortex.

Two artefacts with surface retouch are part of the assemblage (Tab. 5). A leaf point made from green radiolarite has a convex base, the maximum width of the artefact is below the mesial part of the tool, closer to the base. The point tip is chipped off. The longitudinal as well as transversal cross-section are biconvex and the dimensions are 56.4 × 27.9 × 12.1 mm (Fig. 5: 8a, b). The edges are worked with using alternate retouch. Another tool is a more massive artefact of oval shape, made from brown radiolarite, with the dorsal part covered with surface retouch. The ventral surface has partial surface retouch. It is a double convex-straight sidescraper rather than a roughly shaped leaf point. The transversal as well as longitudinal profiles are plano-convex. The artefact is broken into two parts and a part of it is missing. Its dimensions are 128.2 × 48.9 × 9.1 mm (Fig. 5: 6a, b).

Unifacial surface retouch covers a fragment of a tool made from patinated flint. Another fragment of a bifacially processed artefact is also made from patinated opal/chalcedony. Apart from them, a single convex sidescraper (Fig. 5: 3) and a splintered piece (Fig. 5: 4) from patinated opal/chalcedony were also found at the site. One retouched flake comes from silicified sandstone and one is made from patinated opal/chalcedony.

Upper Palaeolithic, Epigravettian

The assemblage of industry classified into the Epigravettian consists of 30 artefacts. The represented raw materials include obsidian (15 exemplars, 50%), patinated flint (13 exemplars, 43.34%); menilite chert and radiolarite are represented by one exemplar each. Obsidian is a local raw material from the sources in the Zemplín Hills (Kaminská, Ďuďa 1985; Bačo et al. 2017). The preserved cortex residues of obsidians with sculpture document use of obsidians from the Zemplín – Cejkov – Brehov source (Přichystal, Škrdla 2014; Bačo et al. 2017). The surface of the obsidian artefacts is not patinated.

Menilite chert and radiolarite belong to local raw materials brought by rivers, mainly the Ondava and Torysa, from the areas of eastern Slovakia further to the north (Kaminská 1991; 2013). Sources of flints do not occur in Slovakia. They were imported from a remote territory outside the Carpathians. The exact identification of the flint is macroscopically impossible, mostly due to the patina. However, its blue-white colour suggests that it could be erratic flint from the territory of Silesia (Přichystal 2009).

Typologically, the assemblage consists of three cores, 21 flakes, and fragments of six tools. The flakes and fragments are from obsidian and patinated flint. Among the four flint flakes, one is partly covered with cortex. The flake butts are flat; one has cortex. Two flint flakes are tablets from the reduction of the striking platform. Fragments from obsidian have various dimensions. Flint fragments and chips are small and come from retouch of the artefacts. The presence of cores and flakes documents the production and shaping of tools at the site.

The blade single-platform core is from menilite chert, with traces of exploitation of parallel blades on the wider front side. The platform is modified by one reduction (Fig. 5: 7). Fissures and a fault in the material made further exploitation impossible. Another single-platform core is on a pebble from brown radiolarite with cortex which was used as a percussor. The platform was modified by a single reduction. The core was exploited on the narrower side and traces of several reduced blades and flakes are also visible on the wider front. Reduction was finished in the initial stage (Fig. 5: 9). Residues of an obsidian core with the original surface with sculpture has also been preserved.

As for tools, only retouched blades and flakes have been preserved. The shapes of butts suggest the use of a soft organic percussor (Pelegrin 2000). The mesial part of a regular blade with retouch on both edges, which is made from patinated flint (Fig. 5: 2). A basal part of a blade with retouch on the right edge is also made from patinated flint. The butt of the blade is linear and the blade base bears trace of slight dorsal abrasion

Fig. 5. Čerhov II – Pod Hečkou A. Chipped stone industry. Middle Palaeolithic: 3 – single convex sidescraper; 4 – splintered piece; 6a, b – double convex-straight sidescraper; 8a, b – leaf point. Epigravettian: 1, 2, 5 – retouched blades; 7, 9 – cores. 1, 2 – erratic flint; 3, 4 – opal/chalcedony; 5 – obsidian; 6a, b, 8a, b, 9 – radiolarite; 7 – menilite chert. Photo by A. Marková, drawing after A. Vol'anská 2016, Fig. 3: 3, 5. See the next page.

Obr. 5. *Čerhov II – Pod Hečkou A. Štiepaná kamenná industria. Stredný paleolit: 3 – jednoduché oblúkovité driapadlo; 4 – odštepovač; 6a, b – dvojité oblúkovito–rovné driapadlo; 8a, b – listovitý hrot. Epigravettien: 1, 2, 5 – retušované čepele; 7, 9 – jadrá. 1, 2 – eratický pazúrik; 3, 4 – opál/chalcedón; 5 – obsidián; 6a, b, 8a, b, 9 – rádiolarit, 7 – menilitový rohovec. Foto A. Marková, kresba podľa A. Vol'anská 2016, Fig. 3: 3, 5. Pozri si ďalšiu stranu.*

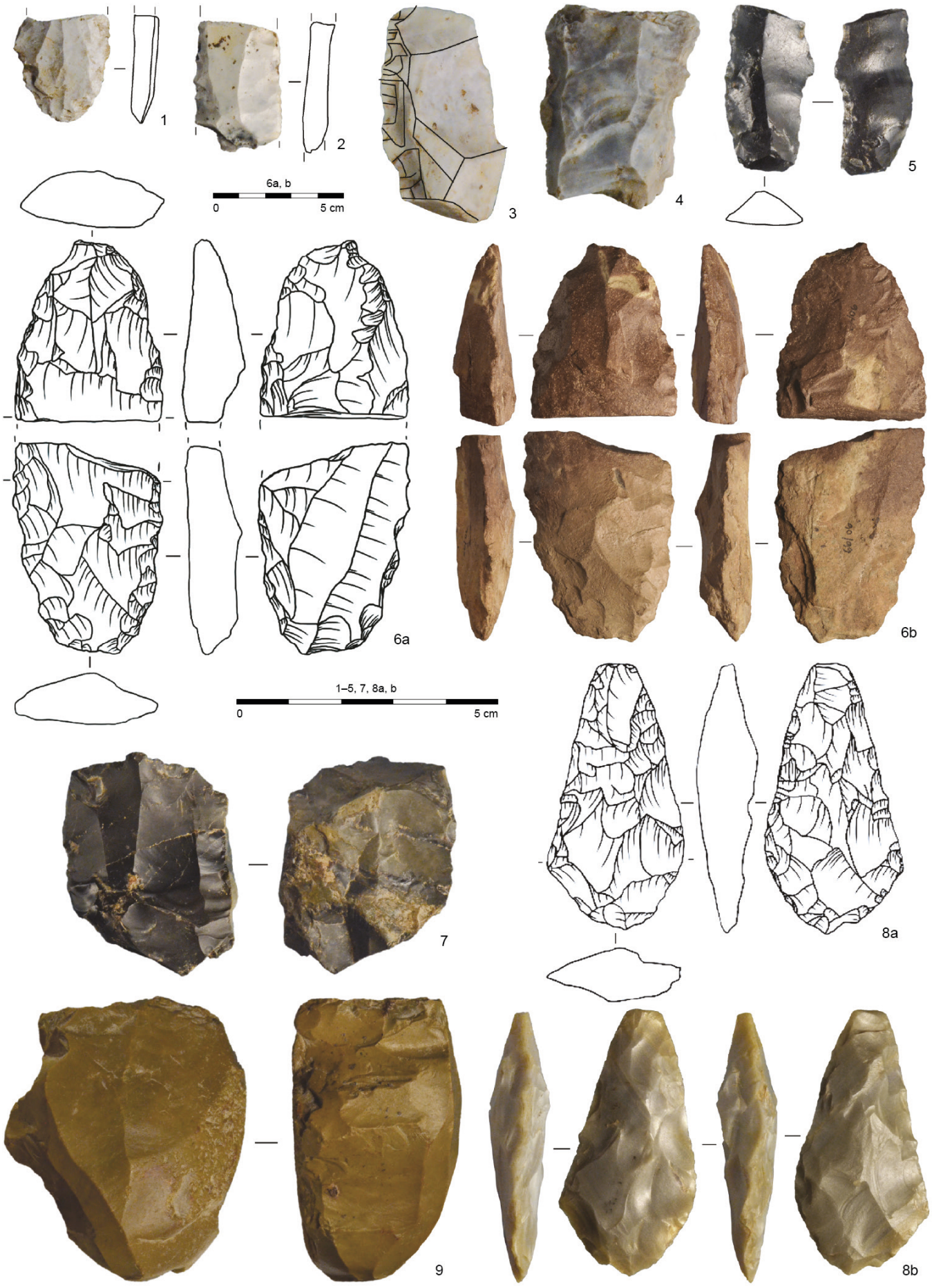

Fig. 5. Čerhov II – Pod Hečkou A. Chipped stone industry. See the previous page.
Obr. 5. *Čerhov II – Pod Hečkou A. Štiepaná kamenná industria. Pozri predchádzajúcu stranu.*

(Fig. 5: 1). A retouched flake is made from the patinated flint. A broken blade is made from obsidian with residues of cortex. Its left edge is retouched on the dorsal surface and the right edge is retouched on the ventral face (Fig. 5: 5). Two retouched flakes from obsidian with cortex residues were discovered as well.

3.2.2 Čerhov II, Pod Hečkou B site

Technological-typological composition of industries

The site of Pod Hečkou B is located on the southwestern side of the hill, 200 m far from site A (Fig. 1: 2; 2). The assemblage of industry consists of 58 artefacts; some of them belong to the Middle Palaeolithic and some of them can be dated to the Epigravettian from the Upper Palaeolithic.

Middle Palaeolithic

Industry comprises flakes made mainly from opal/chalcedony (43 exemplars, 93.48%). Two exemplars document patinated flint with radiolarite also occurring (Tab. 6; 7). In terms of the technology in the industry, cores, flakes, and tools are represented. Flakes from opal/chalcedony with various degrees of white patina are most frequent (37 pieces, 80.43%). A large chunk of opal/chalcedony with several test strikes is classified as a core. Numerous fissures disabled its use as a core. The second artefact is part of a pebble from green-brown radiolarite with several test strikes.

An artefact with modified surface representing a broken leaf point from erratic flint stands out among the seven tools. The base and part of the right edge are broken, which must have been done recently, possibly in association with ploughing, as the break is fresh (Fig. 6: 6a, b). The transversal and longitudinal cross-sections are plano-convex and the dimensions of the preserved part are 44.7 × 24.3 × 8.8 mm.

Three sidescrapers are also distinct types of industry. A double convex-straight sidescraper is made from patinated opal/chalcedony on a flake (Fig. 6: 11). A single convex sidescraper on a flake with a flat butt is made from the same raw material (Fig. 6: 10). A sidescraper on the ventral surface is shaped on a flake from white-blue patinated erratic flint. There were two retouched flakes from opal/chalcedony (Fig. 6: 1, 3) as well as a denticulate, also from opal/chalcedony (Fig. 6: 4).

Upper Palaeolithic, Epigravettian

The assemblage of Epigravettian industry comprises only 12 artefacts (Tab. 8; 9). They are mostly made from obsidian (8 pieces, 66.67%); opal/chalcedony, erratic flint and limnosilicite are also represented. The blade industry contains tools, blades, and flakes. The flakes include three small fragments from obsidian. There are also three blades, made from various raw materials. Regular shorter blades are made from patinated flint (Fig. 6: 9) and limnosilicite. A broken bladelet with finely retouched edges is made from obsidian (Fig. 6: 5). The flake has a point blade with traces of reduction made by a soft stone percussor (Pelegrin 2000, Fig. 3).

Two endscrapers were found among tools. There is a flake endscraper on an obsidian flake with sculpture (Fig. 6: 8) and an indistinct atypical endscraper on a flake from opal/chalcedony (Fig. 6: 2). Burins were represented by two shapes. There was a burin on truncation from obsidian and an atypical burin on a flake from opal/chalcedony. The tools also include a retouched flake from obsidian with a cortex butt.

3.3 Luhyňa I

The site of Luhyňa I – Vel'ké hony is situated southeast of the village on the hill, 146.6 m a.s.l. (Fig. 1: 4; 2). The hill slopes south, its eastern border is delimited by the Hečka Stream. The actual site of Hečka lies 630 m further east, on the left bank of the stream. The area is currently used as arable land. It is a polycultural site with finds of chipped lithic industry from the Upper Palaeolithic, Neolithic/Eneolithic to the Early Bronze Age. A total of 384 artefacts come from the repeated collections by M. Il'ko.

Raw material

Technological groups	Opal/ chalcedony	Radiolarite	Erratic flint	Σ	%
Core + nodule	1	1		2	4.35
Flake	37			37	80.43
Tool	5		2	7	15.22
Σ	**43**	**1**	**2**	**46**	**100.00**

Tab. 6. Čerhov II – Pod Hečkou B. Middle Palaeolithic. Composition of the collection according to technological composition and raw material.

Tab. 6. *Čerhov II – Pod Hečkou B. Stredný paleolit. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

Raw material

Technological groups	Opal/ chalcedony	Erratic flint	Σ	%
Double convex-straight sidescraper	1		1	14.29
Single convex sidescraper	1		1	14.29
Sidescraper on ventral face		1	1	14.29
Leaf point		1	1	14.29
Denticulate	1		1	14.29
Retouched flake	2		2	28.55
Σ	**5**	**2**	**7**	**100.00**

Tab. 7. Čerhov II – Pod Hečkou B. Middle Palaeolithic. Composition of tools by type and raw material.

Tab. 7. *Čerhov II – Pod Hečkou B. Stredný paleolit. Zloženie nástrojov podľa typu a suroviny.*

Raw material

Technological groups	Opal/ chalcedony	Obsidian	Erratic flint	Limno-silicite	Σ	%
Blade		1	1	1	3	25.00
Flake		3			3	25.00
Tool	2	4			6	50.00
Σ	**2**	**8**	**1**	**1**	**12**	**100.00**

Tab. 8. Čerhov II – Pod Hečkou B. Epigravettian. Composition of the collection according to technological composition and raw material.

Tab. 8. *Čerhov II – Pod Hečkou B. Epigravettien. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

Raw material

Technological groups	Opal/ chalcedony	Obsidian	Σ	%
Flake endscraper		1	1	16.67
Endscraper atypical	1		1	16.67
Burin atypical	1		1	16.67
Burin on truncation		1	1	16.67
Retouched bladelet		1	1	16.67
Retouched flake		1	1	16.67
Σ	**2**	**4**	**6**	**100.00**

Tab. 9. Čerhov II – Pod Hečkou B. Epigravettian. Composition of tools by type and raw material.

Tab. 9. *Čerhov II – Pod Hečkou B. Epigravettien. Zloženie nástrojov podľa typu a suroviny.*

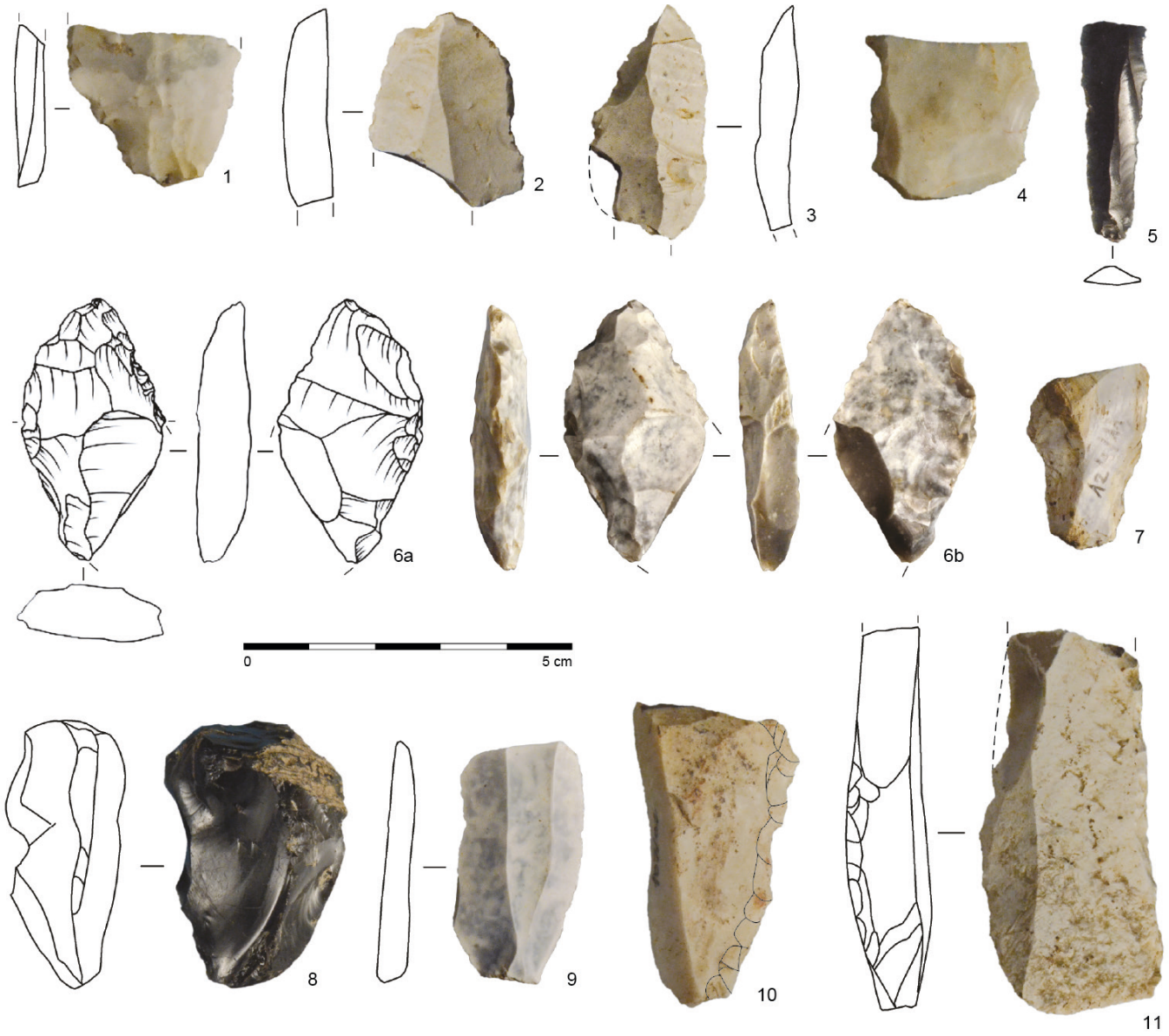

Fig. 6. Čerhov II – Pod Hečkou B. Chipped stone industry. Middle Palaeolithic: 1, 3, 7 – retouched flake; 4 – denticulate; 6 a, b – leaf-shaped point; 10 – single convex sidescraper; 11 – double convex-straight sidescraper. Epigravettian: 2 – endscraper atypical; 5 – bladelet; 8 – flake endscraper; 9 – blade. 1–4, 7, 10, 11 – opal/chalcedony; 5, 8 – obsidian; 6a, b, 9 – erratic flint. Photo by A. Marková, drawing after A. Voľanská 2016, Fig. 3: 2.

Obr. 6. *Čerhov II – Pod Hečkou B. Štiepaná kamenná industria. Stredný paleolit: 1, 3, 7 – retušovaný úštep; 4 – zúbkovitý úštep; 6 – listovitý hrot; 10 – driapadlo oblúkovité; 11 – dvojité oblúkovito-rovné driapadlo. Epigravettien: 2 – nevýrazné škrabadlo; 5 – čepieľka; 8 – úštepové škrabadlo; 9 – čepeľ. 1–4, 7, 10, 11 – opál/chalcedón; 5, 8 – obsidián; 6a, b, 9 – eratický pazúrik. Foto A. Marková, kresba podľa A. Voľanská 2016, Fig. 3: 2.*

Technological-typological composition of industries Upper Palaeolithic, Aurignacian

The most numerous finds of chipped lithic industry – 346 artefacts – bear distinct traces of the Aurignacian culture. Local opal/chalcedony prevails among the raw materials (296 pieces, 85.55%). Its source is located north of the site, approx. 2.5 km away. The opals/chalcedonies from the source in Luhyňa are of poor quality. The largest chunk of roughly processed pre-core has dimensions of 93 × 64 × 61 mm. Most cores have fissures, inhomogeneities, and crystalline concretions in the mass. The opals/chalcedonies are most often grey-green, sometimes with shades of yellow and pale brown. Some chunks are glassy. The surface of the artefacts has white patina of varying intensity, even a different degree of patina on the sides of the same tool. Parts of rough cortex have been preserved on some chunks of raw material as well as some artefact.

Other raw materials were little or rarely represented – obsidian with 26 artefacts (7.51%), limnosilicite (13 exemplars, 3.76%), patinated flint (8 pieces, 2.31%), silicified sandstone (2 pieces, 0.58%) and jasper (1 piece, 0.29%). Obsidian is also a local raw material. One of the sources of obsidian with sculpture is situated on the eastern periphery of the Zemplín Hills within areas of the villages of Zemplín, Cejkov and Brehov – almost the same distance as the crow flies as Viničky on the southern periphery of the Zemplín Hills (Bačo et al. 2017). Obsidians with or without sculpture were used for the production of artefacts. The surface of obsidians shows various degrees of patina – from distinct to poor.

Limnosilicites and jaspers are associated with the same volcanic activity as opals/chalcedonies and can be found nearby (Brezina, Byšta, Zemplín – Kobulský et al. 2014). Patinated flints are silicites from distant territories. When it is possible to evaluate raw material macroscopically, white-blue patina is often found on erratic flint from Silesia.

In technological composition (Tab. 10), the cores and core fragments are represented (11 pieces, 3.76%). There are also flakes, fragments, and chips (276 pieces, 80.63%), blades (5 pieces, 1.45%) and tools (49 pieces, 14.16%). Their presence at the site proves the presence of a complete lithic production chain. It includes import of material, core preparation, reduction, and production of final tools as well as their reshaping after use.

Cores

In the industry assemblage, cores and their residues make up only 3.76%. of the 13 cores, two are pre-cores with several flakes from obsidian nodules (Fig. 7: 1, 4). Another pre-core is from opal/chalcedony. With its dimensions 93 × 63 × 61 mm, it is the largest core in the industry assemblage. The other ten cores are opal/chalcedony and are in the advanced stage of reduction or even worn out. Most of the seven single-platform cores were exploited for flakes (Fig. 7: 8); only two cores were used for blades (Fig. 7: 5). There is one double-platform core (Fig. 7: 6) and one multiplatform cores. The most common type is the flake core with one platform and the same opposite negatives on the debitage surface (Fig. 7: 7). In multiple cases, further reduction was stopped due to fissures in the mass of the raw material. The use of hard stone hammers was preferred.

Raw material

Technological groups	Opal/ chalcedony	Obsidian	Erratic flint	Limnosilicite	Silicified sandstone	Jasper	Σ	% of total
Core	7	2					9	2.60
Core fragments	4						4	1.16
ΣI	**11**	**2**					**13**	**3.76**
Flake	43		2				45	13.00
Fragments and chips	204	19		11			234	67.63
ΣII	**247**	**19**	**2**	**11**			**279**	**80.63**
Blade	2			1	2		5	1.45
Tool	36	5	6	1		1	49	67.63
In total	**296**	**26**	**8**	**13**	**2**	**1**	**346**	**100.00**
% of total	**85.55**	**7.51**	**2.31**	**3.76**	**0.58**	**0.29**		**100.00**

Tab. 10. Luhyňa I. Aurignacian. Composition of the collection according to technological composition and raw material.

Tab. 10. *Luhyňa I. Aurignacien. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

Raw material

Tool	Opal/ chalcedony	Obsidian	Erratic flint	Limnosilicite	Jasper	Σ	%
Endscrapers							
Blade endscraper atypical	1					1	2.04
Blade endscraper retouched	1	1	2			4	8.16
Éventail endscraper		1				1	2.04
Flake endscraper		1			1	2	4.08
Carinated endscraper	2					2	4.08
Carinated endscraper atypical	4		1			5	10.20
Nosed-high endscraper	5					5	10.20
Nosed-high endscraper atypical	2					2	4.08
Nosed-flat endscraper	1		1			2	4.08
Fragments	2					2	4.08
Σ	**18**	**3**	**4**			**26**	**53.04**
Combined							
Combined endscraper + burin			1			1	2.04
Burins							
Dihedral burin	4					4	8.16
Dihedral asymmetrical burin	2					2	4.09
Transverse burin		1				1	2.04
Σ	**6**	**1**				**7**	**14.29**
Other tool types							
Borer			1			1	2.04
Retouched blade unilateral	3					3	6.13
Retouched blade bilateral	3					3	6.13
Raclette				1		1	2.04
Single convex sidescraper	3	1				4	8.16
Single concave sidescraper	1					1	2.04
Retouched flake	1					1	2.04
Tool fragment	1					1	2.04
Σ	**12**	**1**	**1**	**1**		**15**	**30.60**
In total	**36**	**5**	**6**	**1**	**1**	**49**	**100.00**
% of total	**73.47**	**10.20**	**12.25**	**2.04**	**2.04**		**100.00**

Tab. 11. Luhyňa I. Aurignacian. Composition of tools by type and raw material.

Tab. 11. *Luhyňa I. Aurignacien. Zloženie nástrojov podľa typu a suroviny.*

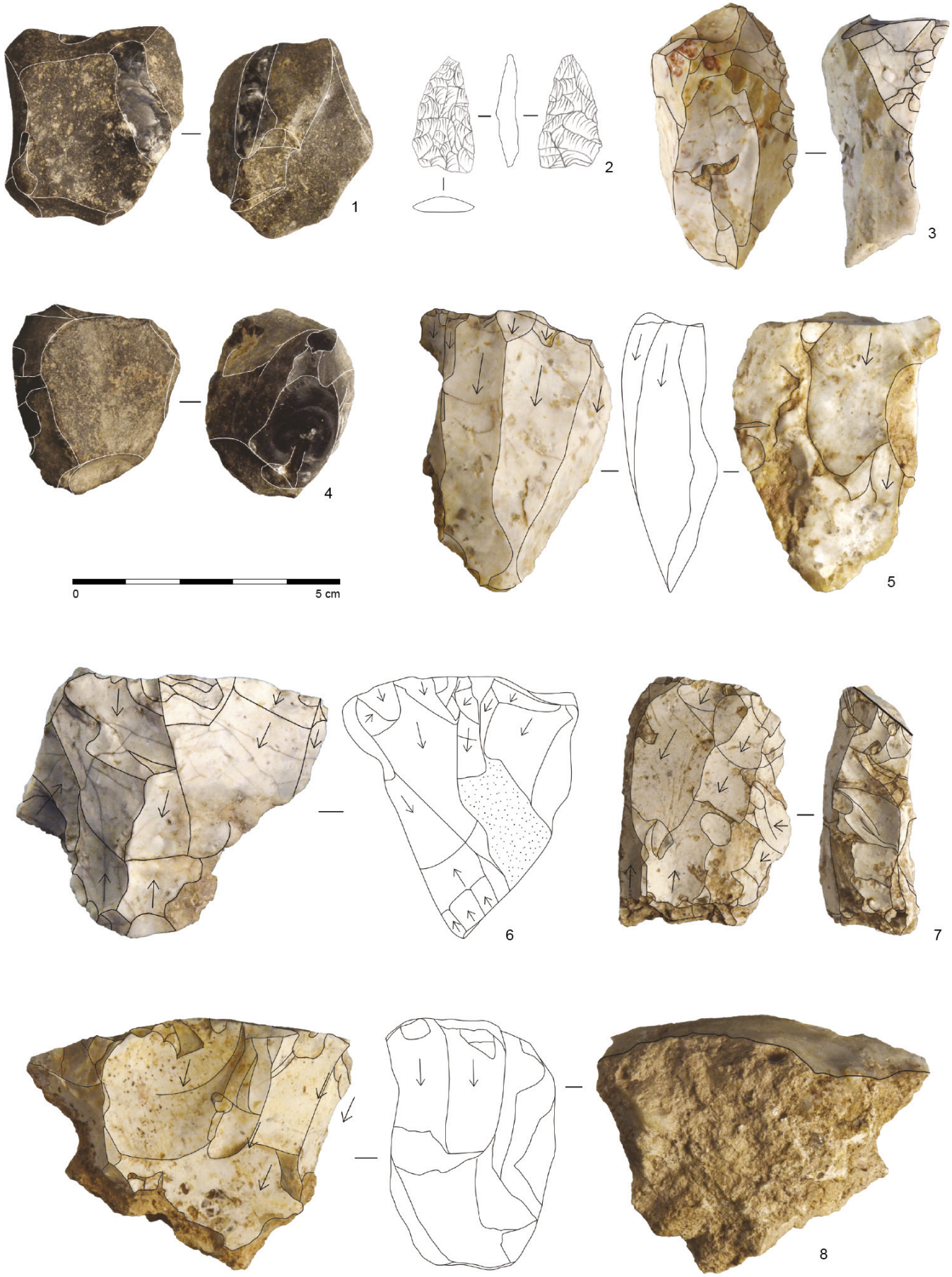

Fig. 7. Luhyňa I. Chipped stone industry. Aurignacian: 1, 4 – pre-cores; 3 – nosed-high endscraper; 5–8 – cores. Early Bronze Age: 2 – arrowhead. 1, 2, 4 – obsidian; 3, 5–8 – opal/chalcedony. Photo by A. Marková, drawing by Ľ. Kaminská.

Obr. 7. *Luhyňa I. Štiepaná kamenná industria. Aurignacien: 1, 4 – počiatočné jadrá; 3 – vysoké vyčnelé škrabadlo; 5–8 – jadrá. Staršia doba bronzová: 2 – šípka. 1, 2, 4 – obsidián, 3, 5–8 – opál/chalcedón. Foto A. Marková, kresba Ľ. Kaminská.*

Flakes, fragments, and chips

The largest group of the lithic assemblage comprises flakes (45 pieces, 13.00%), fragments and chips (234 pieces, 67.63%), 80.63% in total. Most of them were made from opal/chalcedony (247 pieces), 19 exemplars were made from obsidian. There were also 11 pieces from limnosilicite and two pieces from erratic flint. Fourteen flakes with cortex and 57 flakes without cortex come from the initial core preparation. Further exploitation of a core and its repair is suggested by 15 flakes from the edge of a core and one tablet from the striking platform. A total of 234 fragments included five chips from trimming of tools. As far as the percussion technique is concerned, traces on flake butts suggest the use of soft stone as well as a hard stone hammer (Inizan et al. 1999; Pelegrin 2000).

Blades

Only five blades were discovered. One of them is neo-crest from opal/chalcedony and one basal part is made from the same material. Distal parts of two blades from silicified sandstone have been preserved as well (see below, Fig. 10: 8, 9). Only a short blade with a trapezoidal cross-section is made from patinated limnosilicite (see below, Fig. 10: 3).

Tools

The group of tools contains 49 artefacts. Endscrapers constitute more than a half of the tools (26 pieces, 53.06%) (Tab. 11). Most of them are made on thick flakes, mainly from opal/chalcedony. Other raw materials are represented in small numbers. A retouched blade endscraper is made from obsidian (Fig. 8: 4), another is made from opal/chalcedony and two others are made from erratic silicite. Two flake endscrapers are made from jasper (Fig. 8: 2) and obsidian (Fig. 9: 3). There is also an *éventail* endscraper from obsidian (Fig. 8: 5).

Nosed endscrapers (Fig. 7: 3; 8: 6, 7, 9; 10: 11) and carinated endscrapers (Fig. 8: 1, 10; 9: 1) from opal/chalcedony as well as fragments of two other endscrapers are typical Aurignacian tools. There was also a combined tool – a nosed endscraper combined with a dihedral burin made from erratic flint (Fig. 8: 3).

Burins are the second largest group (7 pieces; 14.29%). The types of mesial dihedral burins are characteristic of the Aurignacian (Fig. 8: 8; 9: 4, 6, 7) together with lateral dihedral burins (Fig. 9: 2, 5), often multifaceted, shaped on flakes, from opal/chalcedony, and one transverse burin from obsidian.

Retouched blades have only been preserved in fragments (6 pieces, 12.24%). Blades with unilateral retouch (Fig. 10: 2) and blades with bilateral retouch (Fig. 10: 1, 6) were made from opal/chalcedony.

There were five sidescrapers. Four were convex, three of them made from opal/chalcedony (Fig. 9: 8; 10: 7, 10) and one from obsidian. There was also a concave sidescraper (Fig. 10: 4) from opal/chalcedony.

Other tool types were only individually represented. There was a borer on an erratic flint flake (Fig. 9: 9), a raclette from limnosilicite (Fig. 10: 5), a retouched flake, and a fragment of a retouched tool from opal/chalcedony.

Neolithic /Eneolithic

The assemblage of 37 artefacts from non-patinated obsidian is classified into the post-Palaeolithic period. It consists of residues of cores, flakes, and fragments as well as several tools (Tab. 12). If the cortex has been preserved, it has sculpture. Obsidian artefacts are not patinated.

One core has been preserved together with one nodule and eight core fragments of small to miniature sizes. The core is flat and its dorsal surface is untrimmed, with the original surface. Bladelets 2–5 mm in width were reduced from the wider ventral surface. The dimensions of the core are 17 × 22 × 13 mm. A nodule from obsidian with sculpture is smaller. Artefacts were most often reduced by a hard hammer. Seven fragments and a chip have been preserved. There were only two blades – one mesial and one basal part.

The assemblage of tools consisted of a flake endscraper, four retouched blades and 12 retouched flakes. The flakes with average dimensions of 12 × 22 × 2 mm had flat or damaged butts. Lateral retouch on flakes often overlapped on the artefact surface, with signs of surface retouch, mainly on the ventral face.

Raw material

Technological groups	Obsidian	Σ	%
Core + nodule	2	2	5.4
Core fragments	8	8	21.62
Fragments + chips	8	8	21.62
Blade	2	2	5.4
Tool	17	17	45.96
Σ	**37**	**37**	**100.00**

Tab. 12. Luhyňa I. Neolithic/Eneolithic. Composition of the collection according to technological composition and raw material.

Tab. 12. *Luhyňa I. Neolit/eneolit. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

Early Bronze Age

A triangular obsidian bifacial arrow is a rare tool (Fig. 7: 2). Its left edge is slightly convex; the right edge is almost a plane. The base is partly plane, with one deeper reduction; its transversal cross-section is plano-convex and the artefact dimensions are 22 × 12 × 4 mm.

3.4 Luhyňa II

The site is located in the immediate vicinity of opal/chalcedony sources (Fig. 1: 5; 3: 1). It was discovered in 2023 during the survey of the raw material source and its surroundings. More finds were obtained from the collection in 2024.

Technological-typological compositions of industries

The industry consists exclusively of opal/chalcedony. It contains 161 pieces – cores, their residues, fragments with traces of percussion, chunks of raw material, and one tool. The raw material chunks are irregular, of various sizes, the material is not of high quality, many exemplars occur with fissures and inclusions. The surface of the raw material blocks is covered with uneven patina and residues of rough cortex.

Three prismatic single-platform cores were reduced from pieces of raw material of higher quality. Two of them have a more granular structure, one is glassier. The largest single-platform blade core has the platform created through a single large flake (Fig. 11: 4). The edges of the core are trimmed; the dorsal part is untrimmed (93 × 59 × 50 mm).

A similar single-platform blade core has the platform created through a single flake. The edges of the core are trimmed as well (Fig. 11: 1). The last single-platform core is made from glassy opal/chalcedony with the striking surface created through a single flake (Fig. 11: 3). Apart from the wider ventral part, edges of the core are trimmed as well.

The other seven exemplars are residual cores whose preparation was abandoned due to faults in the material, mainly fissures. Ten fragments with traces of reduction were discovered. Raw material of various sizes (from 2 to 14 cm) without traces

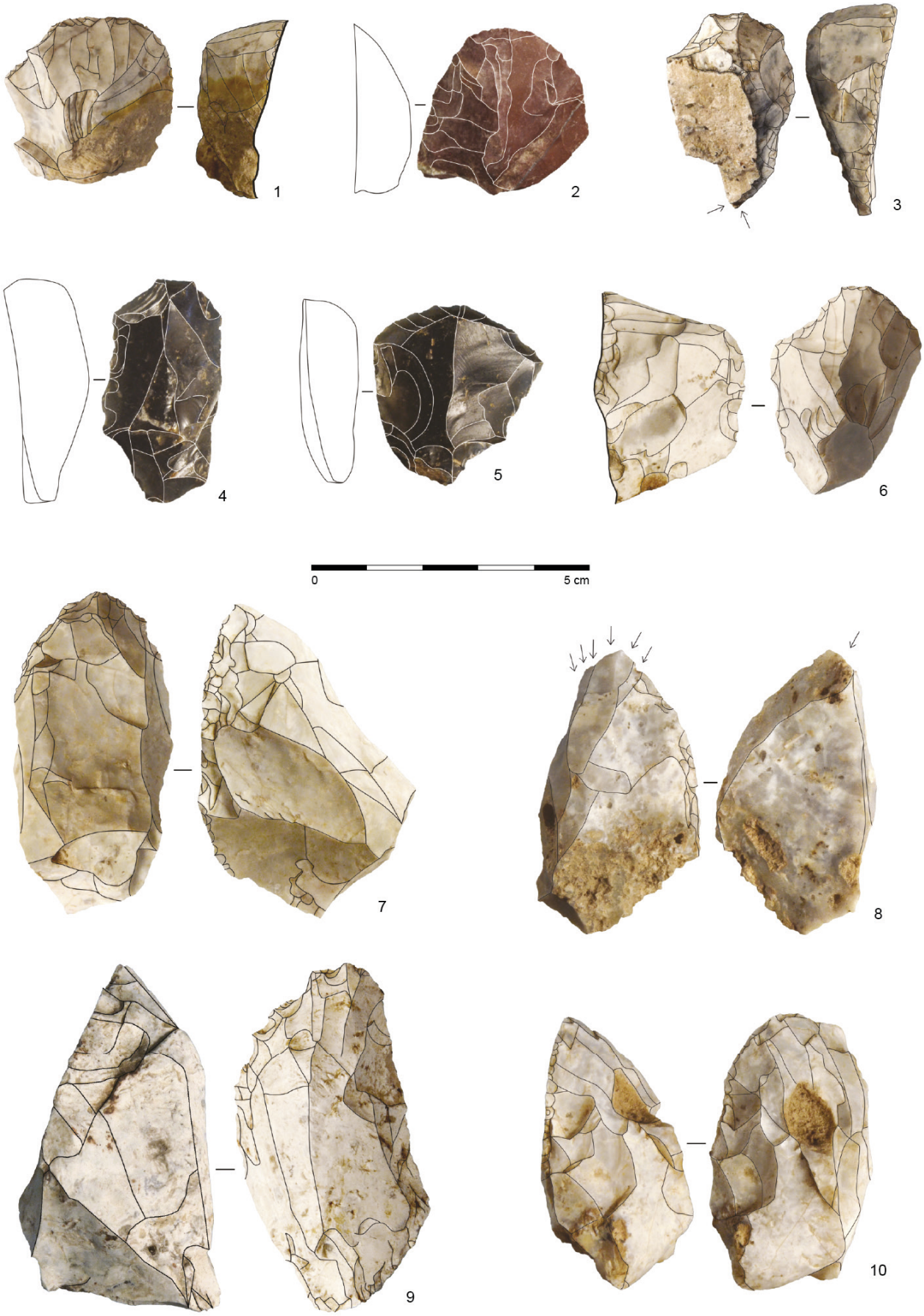

Fig. 8. Luhyňa I. Chipped stone industry. Aurignacian: 1, 10 – carinated endscrapers; 2 – flake endscraper; 3 – combined endscraper/burin tool; 4 – blade endscraper; 5 – *éventail* endscraper; 6, 7, 9 – nosed-high endscrapers; 8 – dihedral burin. 1, 6-10 – opal/chalcedony, 2 – jasper, 3 – erratic flint, 4, 5 – obsidian. Photo by A. Marková.

Obr. 8. *Luhyňa I. Štiepaná kamenná industria. Aurignacien: 1, 10 – kýlovité škrabadlá; 2 – úštepové škrabadlo; 3 – kombinovaný nástroj škrabadlo/rydlo; 4 – čepeľové škrabadlo; 5 – vejárové škrabadlo; 6, 7, 9 – vysoké vyčnelé škrabalá; 8 – klínové rydlo. 1, 6–10 – opál/chalcedón, 2 – jaspis, 3, eratický pazúrik, 4, 5 – obsidián. Foto A. Marková.*

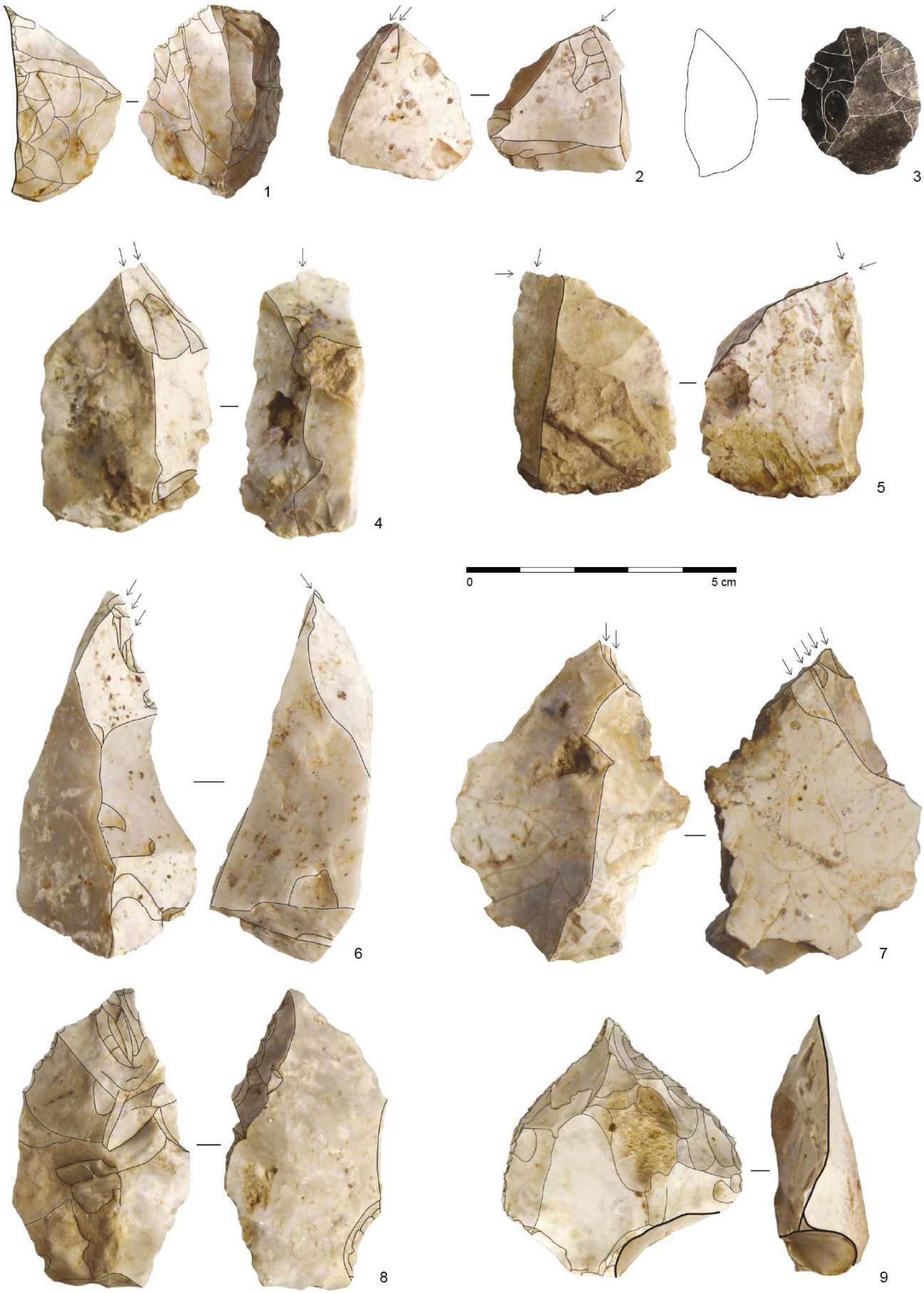

Fig. 9. Luhyňa I. Chipped stone industry. Aurignacian: 1 – carinated endscraper; 2, 5 – dihedral asymmetrical burin; 3 – flake endscraper; 4, 6–8 –dihedral burin; 9 – borer. 1, 2, 4–8 – opal/chalcedony, 3 – obsidian, 9 – erratic flint. Photo by A. Marková.

Obr. 9. *Luhyňa I. Štiepaná kamenná industria. Aurignacien: 1 – kýlovité škrabadlo; 2, 5 – klínové rydlo bočné; 3 – úštepové škrabadlo; 4, 6–8 – klínové rydlo stredné; 9 – vrták. 1, 2, 4–8 – opál/chalcedón, 3 – obsidián, 9 – eratický pazúrik. Foto A. Marková.*

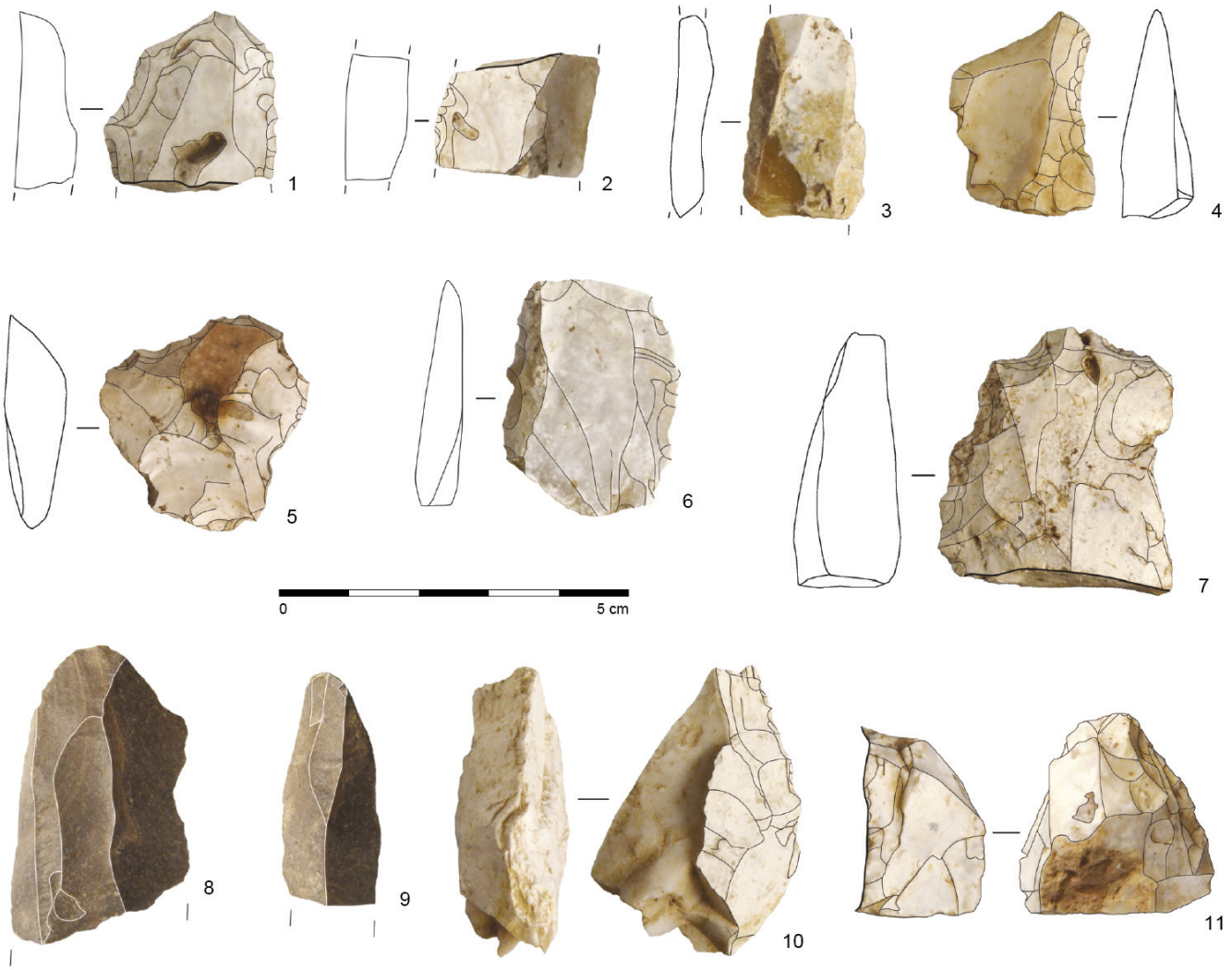

Fig. 10. Luhyňa I. Chipped stone industry. Aurignacian: 1, 2, 6 – retouched blade; 3, 8, 9 – blade; 4 – single concave sidescraper; 5 – *raclette*; 7, 10 – single convex sidescraper; 11 – nosed-high endscraper. 1–7, 10, 11 – opal/chalcedony, 8, 9 – silicified sandstone. Photo by A. Marková.

Obr. 10. *Luhyňa I. Štiepaná kamenná industria. Aurignacien: 1, 2, 6 – retušovaná čepeľ; 3, 8, 9 – čepeľ; 4 – driapadlo vkleslé; 5 – oškrabovač; 7, 10 – driapadlo oblúkovité; 11 – vysoké vyčnelé škrabadlo. 1–7, 10, 11 – opál/chalcedón, 8, 9 – prekremenený pieskovec. Foto A. Marková.*

of reduction is represented by 140 exemplars. The only tool is an atypical double carinated endscraper with formed ends of a thick flake (Fig. 11: 2).

Composition of the assemblage points to a workshop processing raw material at the source. The carinated endscraper and prismatic single-platform cores are typical shapes for the Aurignacian culture.

3.5 Vel'aty III

The site of Vel'aty III is northeast of the source of opal/chalcedonies (Fig. 1: 6). Vel'aty I and II are settlements of the Epigravettian, north of Vel'aty III. The lithic industry was obtained by I. Smatana, who collected it in a cultivated field and it belongs to Upper Palaeolithic and post-Palaeolithic cultures. It contains 113 artefacts. A total of 42 artefacts were classified into the Aurignacian, 14 exemplars belong to the Epigravettian, while 57 artefacts come from the Neolithic/Eneolithic to Early Bronze Age.

Technological-typological composition of industries Upper Palaeolithic, Aurignacian

There are 42 exemplars in the assemblage of Aurignacian artefacts from the early stage of the Upper Palaeolithic (Tab. 13). The share of obsidian among raw materials is 30 exemplars (71.42%), opal/chalcedony is represented by eleven exemplars (26.20%) and one artefact is made from patinated flint. The obsidian artefacts have patina on the reduced surface. The cortex of obsidian cores occurs without sculpture, which suggests their possible origin in the obsidian source in Viničky (Bačo et al. 2017). Cores and flakes from opal/chalcedony have their surface covered with variously strong patina.

The largest technological group of industry contains flakes and fragments. A total of 22 of them are made from opal/chalcedony and eight are obsidians. Obsidian flakes have cortex butts, less flat. They were reduced by a hard hammer from the very edge of a nodule. The surface of flakes is often covered with cortex – from 25 to 100%. Flakes from opal/chalcedony have flat butts.

Raw material

Technological groups	Opal/ chalcedony	Erratic flint	Obsidian	Σ	%
Core	3		4	7	16.68
Flake	8		22	30	71.42
Tool		1	4	5	11.90
Σ	**11**	**1**		**42**	**100.00**
% of total	**26,2**	**2,39**	**71,41**		**100.00**

Tab. 13. Vel'aty III. Aurignacian. Composition of the collection according to technological composition and raw material.

Tab. 13. *Vel'aty III. Aurignacien. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

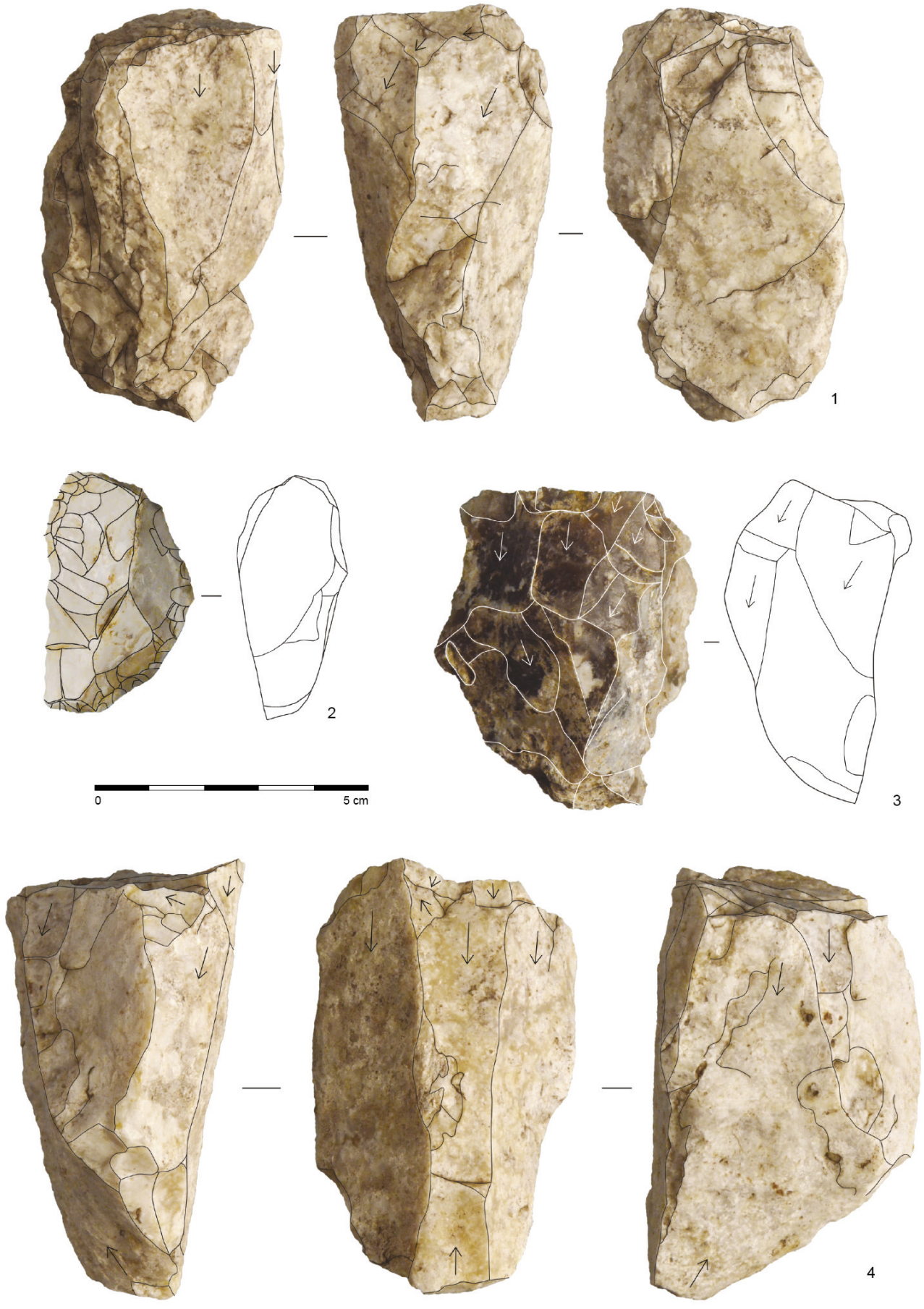

Fig. 11. Luhyňa II. Chipped stone industry. Aurignacian: 1, 3, 4 – core; 2 – double carinated endscraper. 1–4 – opal/chalcedony. Photo by A. Marková.
Obr. 11. *Luhyňa II. Štiepaná kamenná industria. Aurignacien: 1, 3, 4 – jadro; 2 – dvojité kýlovité škrabadlo. 1–4 – opál/chalcedón. Foto A. Marková.*

Cores

From seven cores, four were made from obsidian and three were made from opal/chalcedony. The bladelet prismatic single-platform cores have their dorsal surface covered with cortex without sculpture from patinated obsidian. The striking surface is trimmed by three reductions. Blanks were reduced from the frontal and lateral parts (see below, Fig. 13: 5). The other bladelet core from obsidian was exploited in the frontal part. Residues of cortex without sculpture remained on the left edge (see below, Fig. 13: 9). The remains of a flake single-platform core from patinated obsidian were also found. The fourth obsidian core was single-platform, in the initial stage of preparation with reduced flakes on the narrower side of the obsidian nodule, without a prepared reduction surface. The obsidian is strongly patinated, with sculpture (Fig. see below, 13: 14).

Opal/chalcedony cores were prismatic, double-platform. One of them is a prepared prismatic core for blades with a trimmed ventral part. The opal/chalcedony is patinated, with the exception of cortex residues on the dorsal part (Fig. 12: 5). Another core was used for flakes, with the striking platform showing several reductions (Fig. 12: 6). The last core is from patinated opal/chalcedony; it is a residue of a double-platform prismatic core for parallel blades.

Tools

The group of tools contains five artefacts, including one flake endscraper from obsidian (Fig. 12: 4) and three sidescrapers. Two sidescrapers, one simple convex (Fig. 12: 3) and the other double convex-straight (Fig. 12: 2), were made from obsidian. A double convex sidescraper from burned flint also occurred; it was damaged. There was also a patinated obsidian blade flake with retouched right edge (Fig 13: 6).

Upper Palaeolithic, Epigravettian

The Epigravettian industry includes 14 artefacts, most of which were made of obsidian (64.29%). Patinated flint, limnosilicite, and pre-quartz sandstone are also represented. The collection includes cores, flakes, tools, and blades (Tab. 14). The two flakes, which come from the edges of obsidian and sandstone cores, have flat butts and were reduced with a hard stone hammer.

Two single-platform obsidian blade cores (Fig. 13: 8, 12) have been preserved, mostly reduced from the front surface, while the backs are covered with a cortex without sculpture. In both cases, the striking platform were created with a single strike.

Four neo-crested blades have been preserved, including two obsidian blades with 50% of cortex and with cortex butts. The other two blades are fragmentary, one representing the middle part and the other the proximal part of blades made of patinated flint. Among the tools, a flake endscraper with a retouched right edge made of patinated limnosilicite (Fig. 13: 10) and three retouched blades were identified. One blade made of patinated flint has a broken base and a freshly broken distal end, with a pearl retouch on the left edge (Fig. 13: 4). Another blade made of obsidian has a damaged distal end, retouched edges, and a trapezoidal cross-section (Fig. 13: 2). The basal part of one blade made of obsidian is almost entirely covered with a sculpted cortex, with a retouched left edge and a butt with cortex (Fig. 13: 7). Two retouched obsidian flakes are partially covered with cortex (Fig. 13: 3, 11).

Neolithic/Eneolithic

Fifty-six artefacts were assigned to the Neolithic and Eneolithic periods, with obsidian being the dominant raw material (92.86%). Individual pieces of opal/chalcedony, flint, and limnosilicite are also represented (Tab. 15). Chips predominate, about half of which bear remnants of bark. In addition to seven cores and their remnants, two tools and one blade were also identified. Flakes dominate among the finds (46 pieces, 82.14%). There were 26 of them with cortex and 20 without.

Seven cores were found together with two tools and one blade. The single-platform core for obsidian blades has a striking surface created by a single strike (Fig. 13: 1). Another miniature core with a changed orientation is made of striped grey-black obsidian, and there is also a small single-platform core and opal flakes. The remains of a core with one striking surface made of opal and three fragments of single-platform cores made of obsidian with parts of the original surface have also been preserved.

Only one blade was found – a pointed blade made of light brown limnosilicite, originating from the edge of the core, with a faceted butt and traces of impact from a hard stone hammer (Fig. 13: 13). Among the tools is a blade endscraper with retouched edges made of unpatinated flint, probably of Krakow-Jurassic from Poland, and a retouched flake from the edge of an obsidian core with a sculpture.

Raw material

Technological groups	Obsidian	Erratic flint	Limnosilicite	Silicified sandstone	Σ	%
Core	2				2	14.29
Flake	1			1	2	14.29
Blade	2	2			4	28.57
Tool	4	1	1		6	42.85
Σ	**9**	**3**	**1**	**1**	**14**	**100.00**
% of total	**64.29**	**21.43**	**7.14**	**7.14**		**100.00**

Tab. 14. Vel'aty III. Epigravettian. Composition of the collection according to technological composition and raw material.

Tab. 14. *Vel'aty III. Epigravettien. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

Raw material

Technological groups	Obsidian	Opal/chalcedony	Erratic flint	Limnosilicite	Σ	%
Core	2	1			3	5.35
Core fragments	3	1			4	7.14
Flake	46				46	82.14
Blade				1	1	1.79
Tool	1		1		2	3.58
Σ	**52**	**3**	**1**	**1**	**56**	**100.00**
% of total	**92.86**	**3.58**	**1.78**	**1.78**		**100.00**

Tab. 15. Vel'aty III. Neolithic/Eneolithic. Composition of the collection according to technological composition and raw material.

Tab. 15. *Vel'aty III. Neolit/eneolit. Zloženie súboru podľa technologického zloženia a podľa suroviny.*

Fig. 12. Veľaty III. Chipped stone industry. Aurignacian: 2 – single convex sidescraper; 3 – double convex-straight sidescraper; 4 – flake endscraper; 5, 6 – cores. Early Bronze Age: 1a, b – arrowhead. 1a, b –4 – obsidian; 5, 6 – opal/chalcedony. Photo by A. Marková.

Obr. 12. *Veľaty III. Štiepaná kamenná industria. Aurignacien: 2 – oblúkovité driapadlo; 3 – dvojité oblúkovito-rovné driapadlo; 4 – úštepové škrabadlo; 5, 6 – jadrá. Staršia doba bronzová: 1a, b – šípka. 1a, b; 4 – obsidián; 5, 6 – opál/chalcedón. Foto A. Marková.*

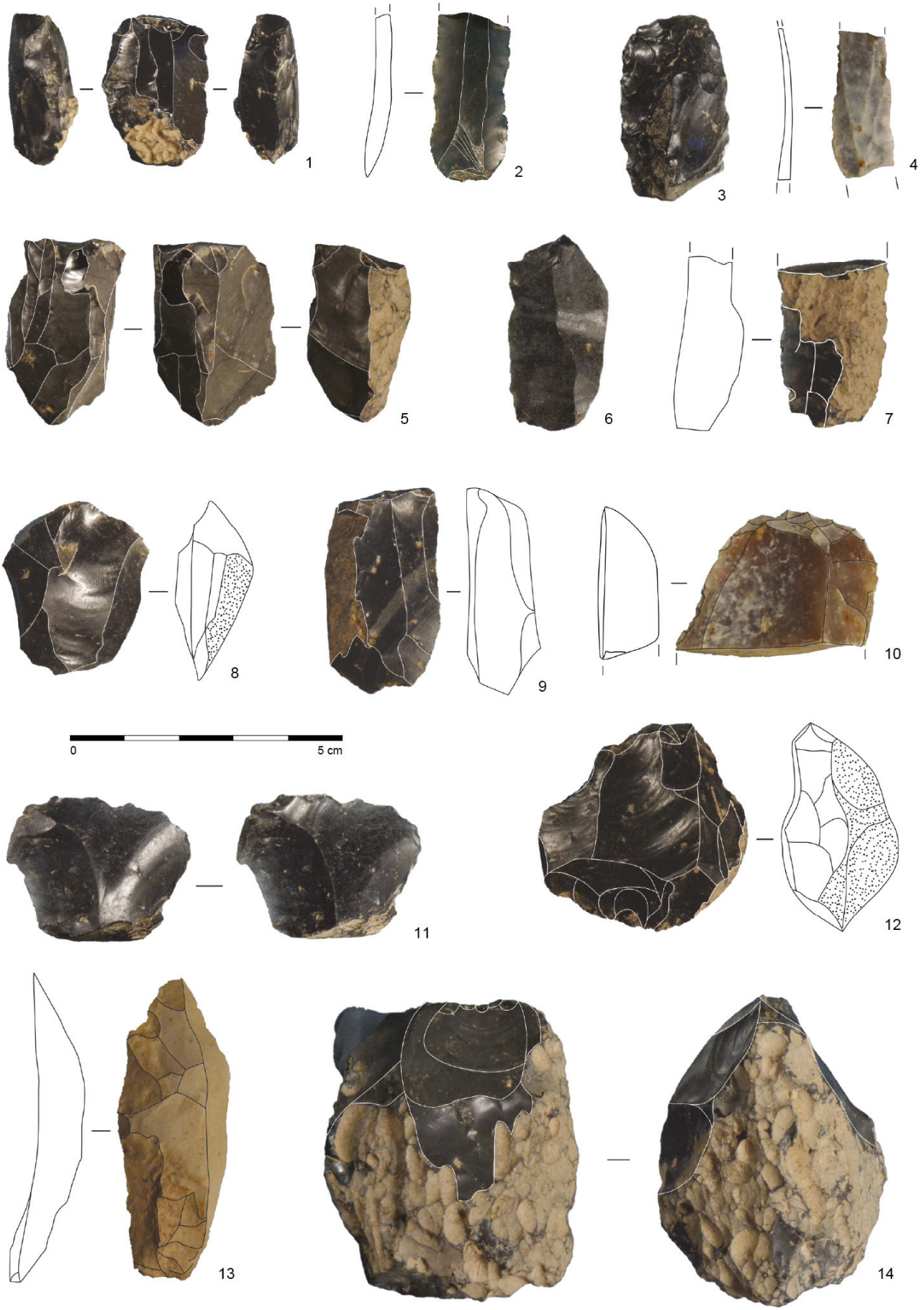

Fig. 13. Veľaty III. Chipped stone industry. Aurignacian: 5, 9, 14 – cores; 6, 7 – retouched blade. Epigravettian: 2, 4, 10 – retouched blade; 3, 11 – retouched flake; 8, 12 – core; 14 – flake scraper. Neolithic/Eneolithic: 1 – core; 13 – blade; 15 – retouched flake. 1–3, 5, 8–12, 15 – obsidian; 4 – erratic flint; 6 – opal/chalcedony; 13, 14 – limnosilicite. Photo by A. Marková.

Obr. 13.*Veľaty III. Štiepaná kamenná industria. Aurignacien: 5, 9, 14 – jadro; 7 – retušovaná čepeľ. Epigravettien: 2, 4, 10 – retušovaná čepeľ; 3, 6, 11 – retušovaný úštep; 8, 12 – jadro; 14 – úštepové škrabadlo. Neolit/eneolit: 1 – jadro; 13 – čepeľ; 15 – retušovaný úštep. 1–3, 5, 7–12, 15 – obsidián; 4 – eratický pazúrik; 6 – opál/chalcedón; 13, 14 – limnosilicit. Foto A. Marková.*

Early Bronze Age

Special attention should be paid to a flatly retouched triangular obsidian arrowhead with slightly convex edges and an almost flat base (Fig 12: 1). The upper side retains the remains of the original cortex with a sculpture, while the lower side is thinned with a single strike. The cross-section of the arrowhead is biconvex, measuring 23 × 15 × 5 mm. Based on its shape and technological features, it can be assumed that this artefact dates back to the Early Bronze Age.

4. Comparison of assemblages

The assemblages of industries from five sites on the western side of the Zemplín Hills belong to several Palaeolithic or post-Palaeolithic cultures. Based on the technological-typological as well as raw material composition, they are attributed to the Middle Palaeolithic, the Upper Palaeolithic cultures of Aurignacian and Epigravettian, and to the post-Palaeolithic period including Neolithic/Eneolithic to the Early Bronze Age. The informational value of the industries is complicated by the fact that they come from collections and do not form a general content of individual cultures, only a part of it. None of the sites have been excavated by archaeologists.

4.1 Middle Palaeolithic

Chipped lithic industry from the Middle Palaeolithic was discovered at the sites of Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A and Čerhov II – Pod Hečkou B. There is no Aurignacian at the sites, only Epigravettian and post Palaeolithic cultures.

Mostly flakes and three discoid cores from opal/chalcedony were found at Veľká Tŕňa – Hečka site. A flake endscraper from radiolarite (Fig. 4: 5) and a leaf point from opal with bifacial retouch are exceptions (Fig. 4: 1a, b). Flakes from opal/chalcedony suggest that the raw material was transported to the site and processed locally.

The leaf point from opal with bifacial retouch is a significant tool. Such raw material is not found in the source in Luhyňa but might have been obtained from the sources of precious opals in the Slanské Hills (Ďuďa, Ozdín 2012, 298–308). Another leaf point from the site has been described. It is supposed that it is made from patinated flint (Voľanská 2016, Fig. 3: 1). However, the leaf point has been lost and we only have an illustration of it (Fig. 4: 8).

There are 42 exemplars of chipped industry from the site of Čerhov II – Pod Hečkou A. Besides the prevailing opal/chalcedony, artefacts were made from radiolarite, flint, silicified sandstone and jasper. A discoid core is made from opal/chalcedony. A jasper core residue was found as well as an opal/chalcedony plaquette with cortex bearing traces of test strikes. Tools with surface retouch are represented by two tool fragments – one from opal/chalcedony and one from flint. A green radiolarite leaf point with bifacial retouch and a broken tip is a distinct tool (Fig. 5: 8 a, b). A massive sidescraper with surface retouch is made from brown radiolarite (Fig. 5: 6a, b).

A total of 43 specimens come from the site of Čerhov II – Pod Hečkou B. With the exception of two flints and one radiolarite, they are all made from opal/chalcedony – mainly flakes. A broken leaf point (Fig. 6: 6a, b) and a sidescraper on the ventral face are made from flint. The other two sidescrapers are made from opal/chalcedony – a straight and a complex convex-straight exemplars. They are significant Middle Palaeolithic tools. Flakes from the same raw material are associated with tool production at the site.

4.1.1 Discussion

The sites near the Zemplín Hills are situated on the hilltops at altitudes of 160–170 m a.s.l., on the interface of the lowland and forest environments. Their stratigraphic position or dating are unknown, as they come from collections on ploughed fields. That is why no animal bones or other organic material suitable for dating has been preserved. Other comparable Middle Palaeolithic sites are located on the terrace of the central Ondava River in Nižný Hrabovec I+II, at altitudes of 150–160 m a.s.l. Despite the excavation in Nižný Hrabovec I+II, no stratigraphic or chronological material for the dating of industries has been obtained (Kaminská et al. 2000).

The chipped industry from all three sites consists of flakes. It contains tools typical of the Middle Palaeolithic Late Mousterian. The lithic industry is mostly made from local opal/chalcedony. One of its sources is located north of Luhyňa, approx. 3.5 km from the sites. The chipped cores are made from a local raw material. Refuse flakes were made during their production. As for finished tools, there are sidescrapers. The production of artefacts at the sites was probably limited, as the number of artefacts is low.

It is typical of the Middle Palaeolithic sites that production of industries is focused on use of local rocks. It was quartzite in Hôrka – Ondrej (Kaminská 1995a; 1999), quartzite and andesite in Bojnice I – Prepoštská jaskyňa (Cave) and in Bojnice III – Hradná priekopa (Neruda, Kaminská 2013), opal/chalcedony and andesite in Prievidza (Bárta 1980, 47), but limnosilicite in Žiar nad Hronom (Bárta, Wiedermann 1980).

Regional raw materials of high quality, i.e. radiolarite, limnosilicite, jasper, and silicified sandstone, were used for production of retouched tools. Limnosilicites and jaspers are local raw materials from sources near the Zemplín Hills and in the nearby Slanské Hills (Ďuďa et al. 1985). Silicified sandstone can be considered a local raw material with a possible source in the sandstone-flysch formation in the mountain range (Žec 1997, 50). Another source is known in the Vihorlat-Gutin Volcanic Range in Ukraine (Rácz 2013, 134).

The source of radiolarite in eastern Slovakia is the klippen belt. The Torysa River runs through the area from which radiolarites arrive in its riverbed by means of weathering of limnic rocks (Kamenica, Kyjov, Milpoš) (Kaminská 2013, 100). Sometimes there were many of them and they created secondary sources on the Torysa's river terrace (Prešov, Veľký Šariš). The Ondava and Laborec rivers bring menilite chert and brown radiolarite chert – newly called silicified claystone (Přichystal 2009, 111) – from the territory of the Carpathian flysch (Michel 1971, 520; Vass, Elečko 1977, 43–66; Kaminská et al. 2000).

Imported raw materials are found at sites from the Middle Palaeolithic. They are mostly various types of flints from Poland or Transcarpathian Ukraine. Flints are most frequent, probably erratic flint from the sources in Silesia (Kozłowski, Pawlikowski 1989) and Volhynian flint from Ukraine (Konoplya 1998). Andesite of the Korolevo type, which is now called vitrophyric dacite has been recently identified among the finds (Rácz 2013, 132).

In terms of technology, the discoid method of core flaking is the most frequently used method in the Middle Palaeolithic (Neruda 2011, 63; 2016, 200, Fig. 6.7), where sidescrapers and tools with notched retouch are the fundamental elements of the inventory (Valoch 1988; Neruda 2011, 49).

The Levallois method has not been detected. In eastern Slovakia, it is clearly documented only in the early stage of the Middle Palaeolithic at the travertine site of Hôrka – Ondrej, area B (Kaminská 2004, 194, Table 1–3). The Levallois method was

also applied in the Bohunician industry in Nižný Hrabovec I+II (Kaminská et al. 2009).

Backed knives typical of the Micoquian do not occur in the tool inventory of the evaluated sites. Only rare finds from eastern Slovakia are attributed to the Micoquian. They include the backed knife of the Prądnik type in Plaveč (Bánesz 1959a; Kaminská 2010a) and the disc-shaped handaxe from Ľubiša 2 – Meravá (Bárta 1986, 186). Backed knives are also present in the Late Mousterian at the travertine site of Hôrka – Ondrej area A (Kaminská 2004, 205), but not in their typical shape (Bosinski 1967). Sporadically, endscrapers are part of Middle Palaeolithic inventories. Two radiolarite endscrapers were found at Hôrka – Ondrej area A (Kaminská 1999, 22, Table 1).

Late Mousterian occupation of eastern Slovakia is concentrated in the area of Spiš travertines and on terraces of large rivers. Basins of the eastern Slovak rivers of Topľa, Ondava, Laborec and Latorica were important communication routes as early as the Middle Palaeolithic. Along them, the migration routes of Palaeolithic groups led to the Carpathian passes, which enabled contact between Slovakia and southern Poland as well as with Transcarpathian Ukraine. The importance of these routes is also documented by the Middle Palaeolithic artefacts, most often sidescrapers, which rarely occur on the river terraces. They were also found in Čertižné on the upper Ondava River, in Hrabovec on the upper Topľa (Bárta 1984, 443), in Soľ and Komárany (Bárta, Mačala 1990) as well as in Červenica on the lower Topľa (Harčár et al. 1995–1996, 10, obr. 4a). More intense Middle Palaeolithic settlement is documented in Nižný Hrabovec I+II and III on the middle Ondava River. The use of the local silicified claystone, regional limnosilicite, radiolarite and menilite chert is important, but mainly the rocks from remote areas, such as erratic flint from Kraków-Częstochowa Jurassic Plateau, Świeciechów flint, Volhynian flint, vitrophyric dacite from Korolevo. Cores are flaked by the discoid method. Among the tools, sidescrapers on thick flakes are significant. They included a sidescraper with surface retouch from menilite chert (Kaminská et al. 2000, Pl. 1: 1).

No Middle Palaeolithic finds from the area of the Zemplín Hills had been known before, if we do not take into account the single obsidian artefact discovered near the obsidian source at the site of Cejkov – Žihľavník dated to the Middle Palaeolithic (Přichystal, Škrdla 2014, 223).

4.1.2 Problematics of leaf points

Finds of leaf points are often subject of debate. The reason is their considerable variability in shapes and occurrence in different cultures of the Middle Palaeolithic, in transitional industries and in cultures of the Upper Palaeolithic. Bifacial retouched leaf points from the sites of Veľká Tŕňa – Hečka and Čerhov II – Pod Hečkou A and B are shaped on flakes. They can be classified as semi-leaf points or sub-leaf points (Nerudová et al. 2011). They are symmetrical in their transversal as well as longitudinal cross-sections. The edges of the point from Čerhov II – Pod Hečkou A are worked with alternate (Mester 2010; 2014) type retouch ('wechselseitig-gleichgerichtete Kantenbearbeitung', according to Bosinski 1967). The points have blunt distal ends as a result of impacts of fracture. They are made from opal, radiolarite and erratic flint. A sidescraper with surface retouch is also made on a thick radiolarite flake.

Surface retouch occurred on 15 artefacts from Middle Palaeolithic sites of eastern Slovakia, in the Late Mousterian, at Hôrka – Ondrej area A. Three of the artefacts are radiolarite leaf points (Kaminská 1999, 21, obr. 15: 12). The isolated finds from the surroundings are probably associated with the settlement in the travertine area. We can mention a bifacially treated radiolarite artefact from Spišské Podhradie – Dreveník (Bánesz 2000, 67, obr. 10) and a radiolarite leaf point from Levoča (Javorský 1980, 127, obr. 58). Two fragments of leaf points with bifacial retouch were published from the site of Bikoš VI in Veľký Šariš (Bánesz, Vizdal 1995). However, they are not available now.

Erratic flint is documented also in Micoquian, at the site of Bojnice I – Prepoštská jaskyňa (Cave) (Neruda, Kaminská 2013, 57) and in Bojnice III – Hradná priekopa (Neruda, Kaminská 2013, Tab. 100). A strong enclave of Middle Palaeolithic settlement is located in the region of Trenčín. Most finds come from collections, but some of them were discovered during the excavation in 2007. Some finds from Trenčianska Turná belongs to the Micoquian, along with older artefacts from Zamarovce. The sites of Mníchova Lehota – Stráže and Mníchova Lehota – Biele hliny are classified into the Mousterian. The cultures with leaf points from Trenčianska Turná I and II, Trenčianska Turná – Hámre and Trenčianske Stankovce I are classified into the end of the Middle and the beginning of the Upper Palaeolithic (Kaminská et al. 2008). Most leaf points and sidescrapers with surface retouch were made from radiolarite, rarely from limnosilicite. One of the sidescrapers from Trenčianska Turná I was made from erratic silicite (Kaminská et al. 2008, 187, obr. 7: 5).

In Central Europe, bifacial tools and leaf points occur in the Middle Palaeolithic industries of the Mousterian and Micoquian (Bosinski 1967; Richter 1997; Jöris 2004), in the Early Upper Palaeolithic transitional industries of Bohunician (Svoboda, Bar-Yosef 2003; Škrdla 2017) and Szeletian (Oliva 1991; 2016; Valoch 2000; Neruda, Nerudová 2005; 2009) as well as Lincombian-Ranisian-Jerzmanowician techno-complexes (Chmielewski 1961; Flas 2011; Demidenko, Škrdla 2023) and, sporadically, also in the Aurignacian (Bánesz 1968; Svoboda 2006). Most of these techno-complexes belong to the period of the extinction of Neanderthals and arrival of the anatomically modern human in Europe. The question of the anatomical affiliation of the bearers of these techno-complexes remains open (Jöris et al. 2022; Neruda 2021).

Besides the Middle Palaeolithic, a form of co-existence of the Szeletian and Aurignacian is important for eastern Slovakia. It is also associated with the topic of Bohunician, whose site was investigated in Nižný Hrabovec I+II (Kaminská et al. 2009). There, Levallois points were discovered, but no bifacial artefacts like those from the evaluated sites near the Zemplín Hills.

The question of the Szeletian has been widely and long discussed, especially by Hungarian researchers, but they do not find unity in the solution. This is primarily because even the finds from the eponymous site are not understood uniformly. The geological and archaeological context of the layers in the Szeleta Cave, together with radiocarbon dating (Ringer et al. 1995, 30; Ringer, Mester 2000; Ringer 2002; Adams, Ringer 2004; Allsworth-Jones 2004; Lengyel, Mester 2008; Ringer 2008–2009), does not offer a simple solution. Leaf points are also part of the Hungarian Mousterian and Micoquian – Bábonyian (Ringer 1983), which is also called the Bábonyian-Szeletian complex and the author assumes its direct development from the Middle to the Upper Palaeolithic (Ringer et al. 1995, 30).

The Szeletian remains in the forefront of interest as a typical industry of the transitional period between the Middle and Upper Palaeolithic (Mester et al. 2013; Mester 2018). New analyses focus mainly on the technological aspects of the production of leaf points (Mester 2010; 2014; Markó 2016). According to Mester (2021, 57); the leaf point itself is a typologically undefined tool, therefore he suggests not using the designation 'Szeletian leaf point' as a typological term.

The previously raised question of what the term Szeletian culture truly means (Simán 1990) persists, and several finds with leaf points or isolated leaf points are perceived as industry in a non-Szeletian context (Dobosi 2008–2009).

At three northern Hungarian sites, Vanyarc (Markó 2011), Galgagyörk (Markó et al. 2002) and Szécsénke (Péntek 2015) in the Cserhát Mountains, which have been excavated and documented, chipped lithic industry containing Middle Palaeolithic artefacts including leaf points, bifacial sidescrapers and knives, retouched flakes and endscrapers made on short and thick flakes with non-lamellar retouches, has been found (Zandler et al. 2021, 35, Table 4). The published OSL dates from Galgagyörk and Szécsénke are around 50,000–40,000 years (Zandler et al. 2021, 34). For this Late Middle Palaeolithic period with the lack of Upper Palaeolithic technological or 'transitional' trait, the authors propose to use the neutral term 'leaf point industry' or 'Blattspitzenindustrie' instead of Szeletian (Bohmers 1951; Bolus, Rück 2000; Bolus 2004) for the industry from sites in the Cserhát Mountains and perhaps also for Moravia and Slovakia (Zandler et al. 2021, 38).

The Middle Palaeolithic open-air sites and caves in north-eastern Hungary are geographically closest to the sites in the vicinity of the Zemplín Hills. Lithic assemblages, containing bifacial tools/leaf points have been found at three open-air sites in the region of Eger on the foothills of the Bükk Mountains – Egerszalók-Kővágó, Eger-Kőporos and Ostoros-Rácpa. Large industry comes from Egerszalók-Kővágó; it mostly comes from collections, less frequently from excavations (Kozłowski et al. 2009, 418–422). The industry belonging to the Middle Palaeolithic, typical of the Mousterian, was chipped from local raw materials and contained 24 pieces, mostly endscrapers and a discoid core (Kozłowski et al. 2009, 418). It is considered the first open-air site of the Middle Palaeolithic in the Bükk Mountains area and, by comparison with the finds from the 4th layer of the Büdöspest Cave, it is considered to be dated to the period before 60 ka BP (Kozłowski et al. 2009, 446).

Other Middle Palaeolithic sites around Eger were known from collections and later from excavations. The Middle Palaeolithic industry from the Eger-Kőporos sites is classified into two Mousterian facies, i.e. the typical Mousterian and the Quina-type Mousterian and the Micoquian, which is represented by the Bábonyian in the Bükk Mountains area (Kozłowski et al. 2012, 457; Budek et al. 2013, 88).

Another open-air settlement from the Middle Palaeolithic is the workshop investigated at the open-air site of Andornaktálya-Marinka south of Eger at the foot of the Bükk Mountains. The chipped Middle Palaeolithic industry, flaked from local and regional raw materials, mainly quartz porphyry, is included in the Bábonyian due to the occurrence of leaf points and backed bifacial knives (Keilmesser; Kerekes et al. 2024).

4.1.3. Evaluation

The Middle Palaeolithic industry from Veľká Tŕňa – Hečka and from Čerhov II – Pod Hečkou A and B is not rich. Leaf points are rare as well. Opal/chalcedony is a local raw material, radiolarite and opal are regional materials, while patinated flint is a distant raw material. No Hungarian raw materials occurred at the site, which reduces the possibility that leaf points might have been associated with the Hungarian Szeletian.

Leaf points must have been imported to the site as finished products, as no flakes documenting their production or reparation at the site have been found. Only the associated industry consisting of sidescrapers made from opal/chalcedony was produced at the site. The territory at the foot of the Zemplín Hills definitely provided an opportunity to use the steppe (lowland) and forest environment rich in sources of food and sources of lithic raw materials. It cannot be denied that the collected material from these three sites represents remains of hunting camps with several short-term occupations by human groups belonging to the same cultural tradition.

4.2 Upper Palaeolithic

Most of the chipped lithic industry from the five sites near the Zemplín Hills are from the Upper Palaeolithic, the Aurignacian and Epigravettian cultures.

4.2.1 Upper Palaeolithic, Aurignacian

Lithic industry with typical artefacts of the Aurignacian culture comes from Luhyňa I, Luhyňa II and Veľaty III. They are the first monuments of the Aurignacian from the surrounding area of the Zemplín Hills. This territory is known mainly for the Gravettian/Epigravettian settlement and post-Palaeolithic cultures. Lithic industry belonging to various cultures was discovered at almost all evaluated sites (with the exception of Luhyňa II). The industry was classified according to the raw materials used as well as the technical and typological characteristics. We cannot completely deny that some non-diagnostic types of artefacts could have been part of cultures other than those we have identified. The chipped lithic industry was found during surveys on agriculturally cultivated land without stratigraphic data and dating possibilities. Small tools, e.g. bladelets, which would contribute to the identification of individual cultures, may not have been found.

Luhyňa I is the largest assemblage of Aurignacian finds and consists of 346 artefacts (Tab. 10; 11). Local opal/chalcedony prevails among raw materials (296 exemplars, 85.55%). It most probably comes from a source near the site. Other local raw materials include obsidian, limnosilicite, jasper, and regional silicified sandstone while the distant raw materials might possibly include erratic flint from Silesia.

Numerous flakes, fragments and chips together with cores point to the production of artefacts in the settlement area. Single-platform cores prevail (Fig. 7: 5, 8); one exemplar was a double-platform core (Fig. 7: 7) and one was with changed orientation. Blades are rare (Fig. 10: 3, 8, 9).

Endscrapers prevail among tools (26 pieces, 53.06%). Most of them were carinated (Fig. 8: 1, 10; 9: 1) and nosed endscrapers on opal/chalcedony flakes (Fig. 7: 3; 8: 6, 7, 9; 10: 11). Other types of endscrapers are also present: blade retouched endscraper (Fig. 8: 4), flake endscrapers (Fig. 8: 2; 9: 3) and éventail endscrapers (Fig. 8: 5). A flint endscraper combined with a burin occurred as well (Fig. 8: 3).

Among seven burins, most of them were dihedral on flakes (including polyhedral) from opal/chalcedony (Fig. 8: 2, 5, 8; 9: 4, 6, 7). One transverse burin was made from obsidian. The assemblage is complemented with five sidescrapers; four of them are made from opal/chalcedony and one is from obsidian (Fig. 9: 8; 10: 4, 7, 10). An erratic flint borer (Fig. 9: 9), a raclette (Fig. 10: 5) and a retouched blade occurred individually (Fig. 10: 1, 2, 6).

Luhyňa II is a site in the immediate vicinity of the source of opals/chalcedonies. The composition of the industry suggests that the site was used for testing poor quality raw material to see if it was suitable for industry production. Three volumetric prismatic single-platform cores were reduced from chunks of a higher quality. In addition to the ventral surface, the edges of the cores are also modified (Fig. 11: 1, 3, 4).

The only tool is an atypical double carinated endscraper, which has both ends of a thick flake formed (Fig. 11: 2).

The composition of the assemblage points to a workshop processing the raw material directly at the source. The carinated scraper and the prismatic single-platform cores are typical shapes of the Aurignacian culture.

At the site of Veľaty III, 42 artefacts are classified into the Aurignacian. Obsidian and opal/chalcedony prevail among raw materials. They are complemented with a single artefact from patinated flint (Tab. 13). More than half of the assemblage are flakes. From seven cores, four were made from obsidian and three were made from opal/chalcedony. Four small prismatic single-platform cores are very distinct. Two of them are used for reduction of bladelets (Fig. 13: 5, 9) and one for flakes (Fig. 13: 14). They are made from smaller obsidian nodules with and without sculpture. On the other hand, opal/chalcedony cores are volumetric double-platform cores for the reduction of parallel blades and flakes (Fig. 12: 5, 6).

The group of tools contains only two sidescrapers (Fig. 12: 2, 3) and one flake endscraper (Fig. 12: 4) were made from obsidian. A damaged double convex sidescraper from burnt flint and a retouched obsidian flake were found as well.

4.2.2. Discussion

The newly discovered Aurignacian sites near the Zemplín Hills complement our information on the spread of this Upper Palaeolithic culture. There are several distinct concentrations of the Aurignacian settlement in the region of eastern Slovakia (Bánesz 1961). The longest-known ones come from the Košická kotlina Basin, the Hornád River basin in particular. The earliest excavations were conducted in Košice Barca I and II (Prošek 1955; 1956; Bánesz 1968) and further to the south, on the border with Hungary, in Kechnec and Seňa (Bánesz 1958a; 1959b; Chu et al. 2018; 2020). In the Eastern Slovak Flat, the settlement in Tibava was investigated (Bánesz 1960a).

Before 2000, a significant concentration of Aurignacian settlement was found in the middle of the Ondava River basin, with the centre in Nižný Hrabovec. Only the settlement in Nižný Hrabovec I+II was investigated and documented (Kaminská et al. 2000). From other sites, i.e. Nižný Hrabovec III, Kladzany, Kučín, Poša, Nižný Hrušov, Sedliská, Ondavské Matiašovce (Kaminská 2003), lithic industry originating from collections was evaluated. A new concentration of settlement, which has not yet been analysed in more detail, was found in the Prešov area, in Medzany I and II (Demidenko et al. 2022, 234–241).

Aurignacian sites in the vicinity of the Zemplín Hills used local raw material sources, which were opal/chalcedony (Luhyňa I and II) as well as obsidian (Veľaty III), limnosilicite, and jasper. The silicified sandstone might come from the sandstone-flysch formation in the Vihorlat Mountains (Žec 1997, 50). The surface of the opal/chalcedony artefacts is unevenly patinated. Obsidian artefacts also have patinated surfaces. Most obsidian cores and a few artefacts have preserved their original surface with sculpture, which would indicate the use of obsidian sources from Cejkov-Brehov (Přichystal, Škrdla 2014); however, some obsidians have cortex without sculpture and they might come from sources in Viničky, i.e. from Carpathian source 1 (Bačo et al. 2017). Detailed analyses have not been performed, so we cannot prove this with certainty. The strongly patinated obsidian tools from Tibava have been analysed and their origin has been determined to be the Tokaj mountain range in Hungary, i.e., Carpathian Group 2a obsidian (Williams-Thorpe et al. 1984, 195). Obsidian tools from the sites in Košice – Barca I and II (Bánesz 1968) and from Kechnec (Bánesz 1959b, 210) are also patinated.

It is interesting that obsidian was also found at the Aurignacian site of Andornaktálya I at the foot of the Bükk Mountains and is thought to have come from Slovak source 1 (Mester et al. 2021, 41). Obsidian is also found at Aurignacian sites in the Cserhát Mountains, namely at the Acsa – Rovnya settlement (Dobosi 2008, 157) and at the Nagyréd 2 settlement in the Mátra Mountains (Lengyel et al. 2006).

Patinated flint, probably erratic flint from Silesia, is a distant raw material. Erratic flint also occurred in a smaller set of Aurignacian finds from Bardejov – Kopytovka (Tunia 2008, 45). It is also occasionally documented at the Acsa – Rovnya settlement (Dobosi 2008, 157). It is the second most abundant raw material at the settlement in Nagyréd 2 (Lengyel et al. 2006, 81).

Technologically, the assemblages from the vicinity of the Zemplín Hills are characterised by blade and flake debitage. In terms of typology, we can evaluate the industry as the Middle Aurignacian, whose typical tools include carinated endscrapers and dihedral burins made on thick flakes. There are also blade and flake scrapers. Endscrapers prevail over burins at Luhyňa I. At Luhyňa II and Veľaty III, endscrapers have been found, but burins have not been recorded.

Blades make up a small part of the inventories. They are also joined by more numerous endscrapers. Borers, raclettes, and retouched chips occur in small quantities.

The reduction of artefacts directly at the settlements is evidenced by numerous flakes, fragments, and chips as well as cores and their residues, or raw material.

Comparing the features of the lithic assemblage from the sites near the Zemplín Hills, similar industries come from the Košická kotlina Basin. At all sites, a local raw material with origin in the Slanské Hills prevails. It was originally identified as chert (Bánesz 1968). The surface of the artefacts is covered with yellow-white patina. Other rocks occur in smaller numbers – mainly radiolarite and obsidian, quartzite, silicified sandstone, rarely quartz porphyry from the Bükk Mountains and Świeciechow flint from Poland (Košice-Barca I).

The settlement in Košice – Barca I is characterised by numerous endscrapers. However, carinated exemplars are rare (Bánesz 1968, 13, Abb. 24: 23; 25: 4). The burins were of various types – on truncation as well as dihedral burins (and also multifaceted shaped burins). Other types of tools were also represented, including borers and sidescrapers (Bánesz 1968).

Similar composition of industry can be observed in Košice – Barca II, where endscrapers prevail over burins. There were also carinated and nosed endscrapers, although most endscrapers are on flakes and blades. Burins, mostly dihedral, occurred as well, along with retouched blades, notched pieces, splintered pieces, and sidescrapers (Bánesz 1968).

The lithic assemblage from the settlement of Kechnec I is represented by industry from collections. It was chipped mainly from limnosilicites (91.58%); radiolarite and obsidian were less frequent and quartz porphyry from the Bükk Mountains occurred rarely. There were many cores of various types: single-platform and double-platform cores, cores with changed orientation as well as pyramid-shaped for reduction of thin blades and bladelets. Endscrapers prevailed over burins. Most of them were on blades and flakes, but carinated and nosed exemplars were present as well. Burins of various types were the second largest group of artefacts, including dihedral burins (and multifaceted shaped). Retouched blades and other types of artefacts, such as sidescrapers and bores, were more frequent (Bánesz 1959b).

Almost complete industry from Seňa I was made from patinated limnosilicites (98.92%), the rest was radiolarite, rarely silicified sandstone. Endscrapers prevailed over burins. The

Aurignacian types of carinated endscraper and dihedral burin were less common (Bánesz 1958a). Three prismatic cores, a thick nosed endscraper and various forms of endscrapers, burins and retouched flakes come from the excavation at the site of Seňa I in 2016 (Chu et al. 2018, 172, 173).

An Aurignacian settlement was excavated on the periphery of the Eastern Slovak Flat, in Tibava (Bánesz 1960a). Silicified sandstone was the main raw material. It might have come from the sandstone-flysch formation in the Vihorlat Mountains, between Ruská Bystrá and Beňatina, approx. 15-20 km from Tibava (Žec 1997, 50). Another source is known in the Vihorlat-Gutin Volcanic Range in Ukraine (Rácz 2013, 134). Smaller numbers of obsidian, limnosilicite, opal, and other raw materials as well as Świeciechow flint from Poland have been documented.

Typologically, endscrapers – including carinated and nosed exemplars as well as retouched blade endscrapers – predominate. Strongly patinated obsidian endscrapers on thick and discoid flakes are particularly distinct. Among burins, burins on truncation prevailed over dihedral burins. Retouched blades, notches and bladelets were also represented by multiple exemplars.

The Aurignacian sites in the middle of the Ondava River stream are different from the ones near the Zemplín Hills and those in the Košická kotlina Basin with their richer composition of raw materials in lithic assemblages. The largest assemblage comes from Nižný Hrabovec I+II, where local silicified claystone prevails (as the site is located near a secondary source of this raw material) and is followed by regional raw materials, such as menilite chert, limnosilicite, radiolarite, obsidian, and jasper. Distant raw materials include quartz porphyry from the Bükk Mountains, Volhynian flint from Ukraine, and chocolate flint from southern Poland. Cores were single-platform and double-platform exemplars as well as ones with changed orientation. Blades were rather frequent, some of them were crested blades. Endscrapers, including carinated specimens, were most common among the tools. There were also burins on truncation and dihedral burins (Kaminská 2003; Kaminská et al. 2000).

The chipped industry from the settlements of Nižný Hrabovec III, Poša I and II, Kučín, Kladzany is reduced predominantly from limnosilicites, but the same regional raw materials and raw materials from distant sources appear there as in the case of Nižný Hrabovec I+II. Only in Kladzany did they also include vitrophyric dacite from Korolevo in Ukraine. The tool composition is also similar to the lithic assemblage from Nižný Hrabovec I+II (Kaminská 2003; Kaminská et al. 2000). Volhynian flint also occurred at the Andornaktálya 1 and 2 sites from the Bükk Mountains in Hungary (Kozłowski, Mester 2003–2004; Mester et al. 2021; Zandler 2012).

Leaf points

In association with the Aurignacian lithic assemblages of eastern Slovakia, we also need to mention the occurrence of leaf points in their inventories. Although they were not found at the Luhyňa I, Luhyňa II and Veľaty III sites, the regional proximity of the Szeletian from the Bükk Mountains also raises this question, especially due to the occurrence of leaf points in Veľká Tŕňa – Hečka and in Čerhov II – Pod Hečkou A and B. We consider them to be Middle Palaeolithic, but we do not know their more precise chronological and stratigraphic position.

Artefacts with unifacial retouch appear in small quantities in the Aurignacian in the Košická kotlina Basin. They are found in Košice – Barca I, where unifacial retouch was applied mainly to sidescrapers (Bánesz 1968, 128, 142, Abb. 21: 12; 31: 1, 5), and also sporadically in Košice-Barca II (Bánesz 1968, 164–170, Abb. 46: 16). The occurrence of quartz porphyry from the Bükk Mountains is documented at the above-mentioned sites. More numerous artefacts with bifacial retouch also come from Kechnec I. Not a single complete tool with surface retouch has been preserved; these are fragments of artefacts, most often endscrapers made from patinated limnosilicite (Bánesz 1959b, 214, Fig. 10: 1; 11).

Distinct leaf points with bifacial retouch come from Čečejovce in the western part of the Košická kotlina Basin. They were discovered during surveys at the site of Vinohrady, together with Aurignacian finds. They were both made from quartz porphyry (Šiška, Császta 1980, 208, obr. 116: 1; Kaminská 1990, obr. 3: 8).

Veľký Šariš is also known for a discovery of a leaf point. The leaf point was made from green radiolarite (jasper) and was discovered near a clay pit (Bánesz 1960b, obr. 109). Its stratigraphic position in the clay pit is unclear. The associated industry is indistinct, most probably Aurignacian. A radiolarite leaf point associated with blade industry comes from Petrovany (Kaminská 1985).

Leaf points are also known from Tibava. During the excavation at the Aurignacian Hrun za cintirom site, the basal part of a tool with surface retouch on the dorsal potion was found (Bánesz 1958b, obr. 175: 2). A complete point was found near the examined area. It is a tool with surface retouch on its dorsal portion; the ventral portion has surface retouch covering only its edges (Bánesz 1958b, obr. 175: 1). A completely worked leaf point from silicified sandstone was the first find from Tibava, but it came from the site of Krivaky (Andel 1955, 146) near the excavated area (Bánesz 1958b, obr. 174).

An older find of a radiolarite leaf point comes from Poša on the middle Ondava River (Bárta 1965, 112, tab. XIX: 3). New finds confirm Aurignacian settlement in this area (Kaminská et al. 2000).

Isolated leaf points remain culturally unclassified. They include an old find from the cave of Domica in Kečov. It is a voluminous leaf point whose both tips are pointed and is made from quartz porphyry. It is considered to be Szeletian also thanks to the raw material (Bárta 1965, 113, tab. XIX: 4). Its analogy is an isolated point from the Hungarian site of Aszód, also made from quartz porphyry. Nevertheless, this exemplar is not considered Szeletian (Dobosi 2008–2009, 75, Fig. 2).

Each of the above-mentioned leaf points differs in its shape and the raw material used. Apart from the points from Čečejovce and Domica, which are made from quartz porphyry, most points are made from the local radiolarite. If they were discovered accompanied by other industry, it usually contained Aurignacian artefacts. Such a situation, if we do not take Hungary into account, also exists in Moravia, where leaf points occur in Aurignacian assemblages (Oliva 1991; Valoch 1990; 2000), especially in the Aurignacian of the Miškovice type (Oliva 1991; 2021; Svoboda 2006). A comparison of the technology of leaf point production processes in the Bohunician, Szeletian and Aurignacian shows various strategies of their preparation (Neruda, Nerudová 2005).

Traditionally, especially in the case of eastern Slovakia, their occurrence was considered a consequence of the contacts of the Szeletian and Aurignacian (Prošek 1953; Bárta 1965; Bánesz 1960b), of their mutual influence. This cannot be denied, because the dating of the Middle Aurignacian and Early Szeletian partially overlap, as shown by the latest dating of the Hungarian Early Szeletian from the Szeleta Cave, from layers 2–4 (Hauck et at. 2016) with dates of between 46 and 36 ka uncalBP, which is accepted (Mester 2018, 34). The extent of mutual contacts cannot be fully clarified for now, but the existing contacts between the regions are confirmed by the finds of quartz porphyry

artefacts from the Bükk Mountains at Middle Aurignacian sites from eastern Slovakia. On the other hand, the assumption that leaf points in unstratified Aurignacian assemblages could be understood as intrusions from the stays of a group of people or individuals at the same location at a different time has not been ruled out (Jöris et al. 2022, 30).

Dating

Only a small amount of data comes from the sites in eastern Slovakia.

Charcoals from pit 2 in Košice-Barca I were dated. The result is 29,680±250 years BP (GrA 16,157), the calibrated age is 33,673-34,277 years BP or 32,025±302 years BC (Verpoorte 2002, 316, tab. 9), or 34±3 ka cal BP (Chu 2018, 130).

The attempt to date charcoals from pit 7 (complex II) from Košice-Barca was not successful. The charcoals came from a Palaeolithic pit, in which burials of the Piliny culture from the Middle Bronze Age were later deposited. The dating results yielded ages for the burials of the Piliny culture (Kaminská et al. 2024).

During the excavation in Seňa I in 2016, samples for OSL dating were also taken. The result of dating 33.5±2.4 ka (Chu et al. 2020, 92) can be considered relevant for most of the Aurignacian settlement in the Košická kotlina Basin and for industries with diagnostic Aurignacian tools, such as carinated and nosed endscrapers and dihedral burins. It also refers to the Aurignacian settlement on the middle of the Ondava River stream. The Aurignacian industries from Luhyňa I and II and from Veľaty III near the Zemplín Hills might also fall in the same chronological frame, i.e. the Middle Aurignacian.

Based on the partial analysis of the radiolarite tool kit from Medzany 1 and 2, this new industry is also considered Middle Aurignacian, along with Nagyréde I and II (Demidenko et al. 2022).

The dating of the sites from the Košická kotlina Basin is in accord with the new dating of the Middle Aurignacian in the Carpathian Basin defined mainly according to the dated Moravian sites, which falls to the period between 36–35 ka – 33–32 ka cal BP (Demidenko et al. 2017, 33; Demidenko et al. 2022, 246).

Aurignacian finds from Tibava were considered the later stage of the Middle Aurignacian due to the blade industry predominating over flakes (Bánesz 1961, 46). Based on the new analysis, Tibava was re-classified into the proto-Aurignacian along with Ukrainian sites of Berehovo I, Korolevo I, Korolevo II and Sokirnica (Tkachenko 2003; Usik et al. 2014; Demidenko et al. 2020).

The occurrence of obsidians and Hungarian quartz porphyry at the sites in eastern Slovakia suggests contacts between the two regions. Several datings are now available for Aurignacian sites from northern Hungary. The layers of the Istállóskő and Peskő caves, where the lithic industry is accompanied by Aurignacian bone points, may indicate occurrence of the Aurignacian in the Bükk Mountains region between 35 and 28 ka BP (Adams, Ringer 2004; Ringer 2002; Markó 2016).

Open-air sites from the Bükk Mountains compared with the Aurignacian of the Košická kotlina Basin have similar dates. These are the sites of Andornaktálya 1 (Zúgó), where the Aurignacian finds belong to the layer which appears in the Interpleniglacial soil AMS dated to 30,180±330 BP (Kozłowski, Mester 2003–2004, 118–120). At the Andornaktálya 2 (Gyilkos) site, the dating is not entirely clear, but the stratigraphic position of the artefacts in soil from the interpleniglacial confirms ages of 24 and 38 ka BP (Mester et al. 2021; Zandler 2012).

Some typical Aurignacian elements appear in surface collections from two other sites. Aurignacian industry was found in Egerszalók-Kővágó, where endscrapers – among them carinated and nosed – predominate in the typological spectrum, (Kozłowski et al. 2009, 426–431). From the collections in Eger-Kőporos, several artefacts belong to the Aurignacian (Kozłowski et al. 2012, 457). Sedimentological analysis and radiometric dating showed that the archaeological material at the sites was deposited in colluvial sediment redeposited around 30 ka BP (Budek et al. 2013).

Other sites from northern Hungary whose typological composition corresponds to the Aurignacian of the Košická kotlina Basin include the Nagyréde 1 and 2 sites in the Mátra Mountains (Lengyel et al. 2006). In the Cserhát Mountains, they are joined by the Acsa-Rovnya sites (Dobosi 2008–2009), Galgagyörk (Markó et al. 2002) and also Csécse-Szőlős-domb (Péntek et al. 2024).

4.2.3 Evaluation

Aurignacian sites near the Zemplín Hills were discovered based on occurrence of lithic industry and subsequent collections. We do not have any stratigraphic material or organic material suitable for dating, as excavations were not carried out.

Chipped lithic industry from the sites suggests various strategies in raw material management. Opal/chalcedony is predominant at the site of Luhyňa I, while obsidian is much more frequently used at Veľaty III.

Human activities can be derived from the analysis of lithic tools. As for the composition of tools, they are mostly common domestic tools. At Luhyňa I and Veľaty III, there were seasonal campsites with industry produced in the areas of the sites. Luhyňa II, which is located just at the source of the raw material, was a workshop – judging by the industry composition.

The occurrence of erratic flint in the industries from Luhyňa I and Veľaty III points to contacts in the northern direction. The more diverse composition of raw materials from settlements on the middle Ondava as well as findings from northern Slovakia point to more intensive contacts through the basins of the Ondava, Laborec and Topľa rivers, which connected eastern Slovakia with the territories above the Carpathian arc near the Carpathian passes. The basins of the Latorica and Uzh rivers, flowing into the Ondava from the east, created conditions for contacts with the areas above the upper Tisza. Routes leading south to northeastern Hungary were also opened and used. Long-term knowledge and use of movement routes is reflected in a good assessment of the possibilities in the given territory, because of the knowledge and adaptation of Palaeolithic people to the existing natural environment.

4.3 Upper Palaeolithic, Epigravettian

Part of the industry from collections at the sites of Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B and Veľaty III was classified into the Epigravettian culture.

Only six artefacts come from the site of Veľká Tŕňa – Hečka. The industry contains five obsidian artefacts and one made from erratic flint (Tab. 2). There is an obsidian pre-core (Fig. 4: 6), two obsidian flakes, and three blades. The middle part of a blade and a blade with a chipped-off base are made from obsidian with slightly patinated surface (Fig. 4: 2). The basal part of a patinated flint blade has also been preserved (Fig. 4: 4).

The assemblage of Epigravettian industry from Čerhov II – Pod Hečkou A consists of 30 artefacts. Half of them are made from obsidian; patinated flint was also rather frequent (13 exemplars, 43.34%). Menilite chert and radiolarite are represented by one artefact each. In the technological composition, there are three cores, 21 flakes and six tools. The menilite chert (Fig. 5: 7) and radiolarite cores (Fig. 5: 9) were single-platform with traces of the reduction of parallel blades. Residue of an obsidian core with the original surface with sculpture was also discovered.

As for tools, only parts of two retouched blades (Fig. 5: 1, 2) and a patinated flint flake with retouch were found. A broken retouched blade (Fig. 5: 5) and two retouched flakes were made from obsidian.

At Čerhov II – Pod Hečkou B, 12 artefacts were classified into the Epigravettian. They are mostly from obsidian; opal/chalcedony, flint and limnosilicite are also represented. The industry contains tools, blades and flakes (Tab. 8; 9). Three blades are made from different raw materials – patinated flint (Fig. 6: 9), limnosilicite, and obsidian.

As for tools, a flake endscraper made from obsidian was discovered (Fig. 6: 8) along with an atypical endscraper from opal/chalcedony (Fig. 6: 2). Two burins are an edge burin on an obliquely retouched obsidian blade and an atypical burin on an opal/chalcedony flake. Tools also include a broken bladelet with finely retouched edges made from obsidian (Fig. 6: 5) and a retouched obsidian flake.

Fourteen artefacts from the site of Veľaty III belong to the Epigravettian. The range of raw materials contains mainly obsidian, less frequently patinated flint; limnosilicite, and silicified sandstone are represented by one exemplar each (Tab. 14).

The industry assemblage consists of cores, flakes, tools, and blades. Flakes from core edges document industry production at the site, using imported raw materials. Blades were reduced from single-platform cores. Two of them were preserved, both made from obsidian (Fig. 13: 8, 12). Four blades include two obsidian and two fragmentary patinated flint blades.

The tool types are represented only by a single flake endscraper from patinated limnosilicite (Fig. 13: 10). The middle part of a retouched blade was made from patinated flint (Fig. 13: 4) and parts of two retouched blades were made from obsidian. There are also two obsidian flakes with retouch (Fig. 13: 3, 11).

4.3.1. Discussion

The assemblages of Epigravettian industry from the evaluated sites of Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B and Veľaty III are atypical and contain few tools. They are chipped mainly from local obsidians with cortex bearing sculpture; it most probably comes from the source in Cejkov – Brehov (Přichystal, Škrdla 2014; Bačo et al. 2017). Most obsidian artefacts have a fine patina on the surface, which was also found on tools from the upper layer in Kašov I (Bánesz et al. 1992, 16). Obsidian is a typical predominant raw material of Epigravettian assemblages in eastern Slovakia (Bánesz et al. 1992, 8; Kaminská 1995b). Limnosilicite and opal/chalcedony are also local raw materials. Silicified sandstone is a regional rock. Menilite chert and radiolarite are among the regional raw materials that reach the southern regions of eastern Slovakia in the beds of the Ondava and Torysa rivers from the northern parts (Kaminská 1991; 2013). These local and regional raw materials were also used at other Epigravettian sites around the Zemplín Hills (Kaminská 1986a, Tab. 5).

Macroscopically evaluated patinated flints are considered to be erratic flint from the Silesian region only because of the blue-white patina (Přichystal 2009). Erratic flint occurs in the environment of the eastern Slovak Epigravettian and is even more significantly present at some sites – Hrčeľ – Nad Baňou, where it makes up 6.03% (Bánesz, Kaminská 1984, 257) or Kašov I – upper layer (2.33% – Bánesz et al. 1992, 9).

The technological composition of the industries includes cores, fragments, blades, and tools. Cores represent single-platform shapes for blades and bladelets, core residue, or core with testing scars. The production of artefacts took place at the site, as evidenced by a blank rejuvenating flaking surface of obsidian cores and fragments with cortex. There were also erratic flint tablets from Čerhov II – Pod Hečkou A (2 pieces) and in Veľaty III from silicified sandstone. However, the cores of these raw materials are absent. In Čerhov II – Pod Hečkou A, there were also four fragments and two chips from erratic flint. There was a menilite chert and radiolarite cores as well, but flakes or tools were not found.

Blades from obsidian, erratic flint, and limnosilicite have been mostly fragmentarily preserved. Two neo-crested blades from obsidian which were found in Veľaty III are exceptions.

The group of tools is poorly represented. There were only two flake endscrapers in Čerhov II – Pod Hečkou B – one from obsidian and one from opal/calcedony – and one flake endscraper from limnosilicite in Veľaty III. Two burins occurred in Čerhov II – Pod Hečkou B – one on truncation from obsidian, one atypical from opal/chalcedony. Retouched blades included two made from patinated flint and one from obsidian in Čerhov II – Pod Hečkou A and two from obsidian as well as one from patinated flint in Veľaty III. An obsidian bladelet with pearl retouch on both edges with a broken distal end comes from Čerhov II – Pod Hečkou B (Fig. 6: 5). Retouched flakes – two from obsidian and one from erratic flint – were found in Čerhov II – Pod Hečkou A. Two retouched obsidian flakes come from Veľaty III.

The industry from the evaluated sites consists of blades. Single-platform cores are similar to those from other Epigravettian sites in the vicinity of the Zemplín Hills. Similar types of cores occurred in the assemblages from Veľaty I and II, which are located north of Veľaty III (Kaminská 1986a, 602, obr. 3: 12), as well as at the Hrčeľ – Pivničky site (Kaminská 1995b, obr. 18: No. 502). In Kašov I – upper layer, cores were the most numerous finds (Bánesz et al. 1992, 11).

The toolkit is not very distinctive. Flake endscrapers are part of the inventories of all Epigravettian assemblages (Bánesz, Kaminská 1984, 257; Bánesz et al. 1992, 12, Tab. 3: 35) as well as burins on truncation (Kaminská 1986b, 222; Bánesz et al. 1992, Tab. 5: 18, 19).

Backed bladelets were not found at the sites. Only in Čerhov II – Pod Hečkou B was a blade with pearl retouch of the edges found. This is perhaps because small-shaped tools are more difficult to find. They were not frequent even in the excavations of Epigravettian sites. The presence of backed bladelets was low in Kašov I – the upper layer, it was only 0.12% (Bánesz et al. 1992, 9), in Hrčeľ – Nad Baňou there were only two (Bánesz, Kaminská 1984, 258). Retouched blades and flakes also occur at all sites.

4.3.2. Evaluation

Chipped lithic industry from the sites of Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B and Veľaty III has essential features of the Upper Palaeolithic. Raw material and technological-typological composition allow its comparison with Epigravettian sites in the region. The relatively small number of artefacts at individual sites partly corresponds to the conditions of their recovery – by collecting from ploughed fields. Another possible reason might be the fact that the sites were seasonal campsites with a short existence of groups of people doing housework who took part of the industry with them when they left.

4.4. Neolithic/Eneolithic – Early Bronze Age

Industry from the Neolithic/Eneolithic – Early Bronze Age was discovered at the sites of Veľká Tŕňa – Hečka, Luhyňa I and Veľaty III. Its more precise classification into one of the cultures is impossible as no pottery sherds were discovered.

In the settlement of Veľká Tŕňa – Hečka eight exemplars of industry from the Neolithic/Eneolithic to Early Bronze Age were found. The artefacts were made from obsidian and limnosilicite (Tab. 3). They include an obsidian nodule, three flakes and four tools.

Tools were represented by a short obsidian blade endscraper with an oblique front (Fig. 4: 3), two retouched obsidian blades, and a notched obsidian flake.

The assemblage of 37 artefacts from non-patinated obsidian was classified into the post-Palaeolithic period from the settlement in Luhyňa I (Tab. 12). It consists of core residues, flakes, and several tools. As for tools, only one flat bladelet core, one nodule, and eight residues of small to miniature cores have been preserved. There were only two blades.

The toolkit contained a flake endscraper, four retouched blades, and 12 retouched flakes. Lateral retouch on the flakes often overlapped on the surface of the artefact with suggested surface retouch, mainly ventral. Apart from these tools, an arrowhead with surface retouch made from obsidian also appeared (Fig. 7: 2).

In the settlement of Veľaty III 56 artefacts were classified into the Neolithic/Eneolithic-Early Bronze Age. Obsidian significantly prevails over other raw materials; two exemplars are made from opal/chalcedony. Flint and limnosilicite are represented by one exemplar each (Tab. 15). Flakes prevail among the finds. There were seven cores and their residues. They are complemented with two tools and a blade.

A single-platform bladelet core is on an obsidian flake (Fig. 13: 1). Another miniature core has a changed orientation. There are also two single-platform cores from opal and two residues of obsidian single-platform cores.

One limnosilicite neo-crested blade occurred (Fig. 13: 13). Tools include a retouched blade endscraper from non-patinated flint, probably Krakow-Jurassic from Poland, and a retouched obsidian flake. An obsidian arrowhead occurred too.

4.4.1. Discussion

Chipped lithic industry from the evaluated sites is almost exclusively made from obsidian. The three limnosilicite flakes from Veľká Tŕňa – Hečka are an exception. In Veľaty III, two artefacts were made from opal/chalcedony, one from flint and one from limnosilicite. Obsidians, limnosilicites, and opal/chalcedony are local raw materials. Only the flint, probably Krakow Jurassic flint, is of Polish origin.

In total, 15 cores were found. They include a flat core for blades, a single-platform core for obsidian bladelets, two single-platform from opal, one with a changed orientation from obsidian, and ten residues from single-platform obsidian cores.

Only three blades were found, one of them is made from limnosilicite; it is larger than other two obsidian exemplars. Tools are represented by two retouched blade endscrapers, one flake endscraper, six retouched obsidian blades, 13 retouched flakes from obsidian and one notch made from obsidian.

Obsidian industry contains miniature shapes and appears to be Mesolithic industry. However, we have not yet identified typical Mesolithic tools, so its classification into the Mesolithic seems unlikely. A more precise classification into individual cultures is made difficult by the absence of pottery material, which either did not occur at the site or was not collected.

The presence of obsidian nodules, cores, and their residues as well as flakes – often with cortex residues – and fragments of blades indicates the production of artefacts from imported raw material at the site. Obsidian was the main raw material of industries in Neolithic and Eneolithic cultures of eastern Slovakia (Kaminská 2018; 2021), with the exception of cultures of the Polgár sphere, where it was replaced by Volhynian flint – at settlements (Kaczanowska 1985, 166; Kaminská 1987) as well as burial grounds (Šiška 1968; Vizdal, 1977). Among Neolithic cultures, obsidian makes up the vast majority of the raw material of the Bükk culture from the Middle Neolithic. Apart from common blade industry, large pyramidal cores for blades from the site of Kašov – Čepegov I are known from its environment (Bánesz 1991). It is assumed that they became the subject of raw material trade and thus they reached western Slovakia and neighbouring countries (Šiška 1991; 1998). A detailed technological analysis of core and blade production revealed that they were debited by indirect percussion (Allard et al. 2017). In the neighbouring villages of Veľká Tŕňa and Malá Tŕňa, there are settlements with the Bükk culture where obsidian is predominant (Janšák 1935, 67–69; Kaminská, Cheben 1983).

In the Upper Neolithic, in the environment of the Csőszhalom – Oborín, Hrčeľ – Nad Baňou site, obsidian makes up almost 75% of industry (Kaminská, Pelisiak 1991, tab. 1). Obsidian core residues were small (Kaminská, Pelisiak 1991, obr. 2. 12; 3: 14; 5: 15; 9: 12). Thirteen flake endscrapers were found among 91 retouched artefacts (Kaminská, Pelisiak 1991, tab. 3). A miniature exhausted core was also found in Oborín, in the material of the Csőshalom – Oborín group (Vizdal 1970, tab. V: 24).

In the environment of the Baden culture discovered at Hrčeľ – Nad Baňou site (Kaminská 1987, 503–505), at Hrčeľ – Pivničky (Kaminská 1995b, 62) and in the neighbouring village of Veľaty I (Kaminská 1995b, 79), obsidian industry prevailed as well.

Residues of miniature cores and flakes with suggested surface retouch are closest to the finds from Čičarovce – Veľká Moľva. The site was repeatedly settled and one of its parts belonged to the Eneolithic/Early Bronze Age. Finds of the proto-Tiszapolgár stage of the Polgár culture from feature 36/98 included a miniature single-platform obsidian core for thin bladelets (Kaminská 2010b, 21, tab. VI: 15). The proto-Tiszapolgár settlement is dated (VERA 2094) 5,745±35 BP, calibrated 4,607±55 BC (Stadler et al. 2000; Kaminská 2010b, 28). Miniature single-platform obsidian cores also come from the environment of the Tiszapolgár culture, the site of Čičarovce – Veľká Moľva (Kaminská 2010b, 33, obr. VII: 5). Even more of them occurred in features of the Nyírség-Zatín culture from the turn of the Eneolithic and the Early Bronze Age, from feature 26/98, but mostly from feature 34/98 and from the collection near the features (Kaminská 2010b, 43, 51, 57, tab. VII: 4, 10). Retouched flakes and parts of blades with suggested surface retouch or retouch on the ventral portion were discovered with them (Kaminská 2010b, 57, 63, 64, tab. VII: 6-9, 12, 13, 14).

Obsidian industry is also known from the environment of Neolithic and Eneolithic cultures of western and southern Slovakia, where, however, it is not very frequent (Kaczanowska, Kozłowski 1991). Remarkable discoveries include the assemblage of chipped lithic industry uncovered at the settlement of the Classic Lengel culture from the Late Neolithic, the site of Kiarov – Veľké ortovisko in southern Slovakia in 2023. In the raw material composition of the industry, obsidian is represented by 62%, which consists of 388 artefacts. A special feature of the assemblage is 37 miniature cores for bladelet production. Most of them were single-platform cores. Obsidian blades debited from larger cores were also found (Popovičová, Beljak Pažinová 2025). A lithic industry containing a miniature obsidian core was found at the settlement of Nitra-Selenec, belonging to the Ludanice group of the Lengyel culture from the beginning of the Eneolithic (Nemergut et al. 2022, 197).

There are many sites with obsidian artefacts in Poland. Let us mention at least one example from the Malice culture, where several miniature cores belonging to a set of 585 obsidian artefacts were discovered at the settlement in Targowisko 11 (Wilczyński 2010).

From the later period, from the beginning of the Bronze Age, chipped lithic industry from features and collections, mostly made from obsidian, also occurs at Polish sites with Orawa type industry (Valde-Nowak 1986). Small artefacts, bifacially retouched with several series of retouches (Kopacz, Valde-Nowak 1987, 75), are most numerous. They are similar to the obsidian artefacts of the Nyírség-Zatín culture at Veľká Moľva site in Čičarovce.

Arrowheads with surface retouch

Triangular obsidian arrowheads with bifacial surface retouch from Luhyňa I (Fig. 7: 2) and Veľaty III (Fig. 12: 1a, b) are independent tools. Surface retouch on the arrowheads was made by pressure (Pelegrin 2000). With their shapes they are most similar to the obsidian arrowhead from the site of Sárča, west of Sirník (Janšák 1935, 55, mapa 4: f, g, Tab. XXVII: 21).

Arrowheads with surface retouch are distinct Eneolithic or Early Bronze Age tools. The exemplars in eastern Slovakia whose affiliation to a specific culture was determinable belong to the Košťany and Otomani-Füzesabony cultures. Several exemplars are known from burial grounds in the Košická kotlina Basin – from Košice (Pástor 1969), Valaliky-Všechsvätých (Pástor 1978) or Valaliky-Košťany (Pástor 1962). In the environment of the Otomani-Füzesaboni culture in Nižná Myšľa, they were found in burials (Olexa, Nováček 2013, 49–50) and in settlement features (Olexa et al. 2021, 232).

The most recent finds of obsidian arrowheads with concave bases were uncovered in 2023 during the excavation of the Eneolithic Yamnaya culture tumuli in Michaľany-Gačina near the sites of Veľaty III and Luhyňa I. Obsidian arrowheads with wings were found in burials of the Košťany culture which were sunken in the perimeter of tumuli 1 and 2 (Horváthová, Jarosz 2023; Jarosz et al. 2024, 45). Obsidian arrowheads from Luhyňa I and Veľaty III might be associated with the Košťany or Otomani-Füzesabony cultures (Kaminská 2025).

4.4.2. Evaluation

Numerous finds of chipped lithic industry at the sites of Veľká Tŕňa – Hečka, Luhyňa I and Veľaty III are from the Neolithic/Eneolithic – Early Bronze Age. Their exact classification is complicated by the lack of further information, mainly absent pottery material. It is rather probable that the industries belong to multiple cultures and were created by their later mixing. Some shapes, mainly miniature cores and flakes with partial surface retouch, shift them to the Eneolithic rather than the Neolithic.

The presence of cores, cortex and other flakes from exhausted cores and tools shows their production from imported raw materials at the site. The tool types belong to those artefacts associated with housework. The purposeful preference of small obsidian nodules for production of bladelets – probably used as arrowheads or parts of compound tools – is rather specific. We come across this phenomenon from the end of the Neolithic to the beginning of the Early Bronze Age not only in eastern Slovakia, but also in more remote regions (western Slovakia, Poland), where obsidian was imported.

5. Conclusion

In the territory of hills west of the Zemplín Hills, as far as the Roňava River, which creates the border with Hungary, many sites with lithic industry have been discovered. They are various localities in the cadastral areas of the villages of Veľká Tŕňa, Čerhov, Luhyňa and Veľaty. Many of these are at favourable sites which were settled repeatedly. This resulted in polycultural sites with chipped lithic industry from the Palaeolithic and from post-Palaeolithic cultures. Pottery sherds have not been found at any of them. Finds come from collections carried out by M. Ilʼko and I. Smatana at Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B, Luhyňa I, Luhyňa II and Veľaty III.

5.1 Geology of the region and sources of raw materials

The territories of the Zemplín Hills as well as the Slanské Hills further to the west are famous for the occurrence of suitable raw materials which were widely used in the Stone Age. There were mainly obsidians, which are products of Tertiary rhyolitic volcanism. Obsidians are concentrated in two sources. One of them is Viničky with small obsidians, mostly without sculpture (Bačo et al. 2017). The second source is located in the Cejkov-Brehov area, where obsidians with sculpture occur (Přichystal, Škrdla 2014). Besides obsidians, opals/chalcedonies, limnosilicites, and jaspers were used (Ďuďa, Ozdín 2012).

5.2 Middle Palaeolithic

Chipped lithic industry from the Middle Palaeolithic was discovered at the sites of Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A and Čerhov II – Pod Hečkou B. Chipped lithic industry from all three sites consists of flakes. It contains tools typical of the Middle Palaeolithic Late Mousterian. Lithic industry is mostly made from the local raw material – opal/chalcedony. One of its sources is situated north of Luhyňa. Chipped cores produced by discoid method are made from the local raw material.

The blanks for the bifacially retouched leaf points from the sites of Veľká Tŕňa – Hečka and Čerhov II – Pod Hečkou A and B are flakes and can be classified into semi-leaf points or sub-leaf points (Nerudová et al. 2011). They are symmetrical in their transversal as well as longitudinal cross-sections. The edges of the point from Čerhov II – Pod Hečkou A are worked with an alternate type of retouch (Mester 2010; 2014) ('wechselsetig-gleichgerichtete Kantenbearbeitung' according to Bosinski 1967). The points have backed distal ends as a result of impact or fracture. They are made from opal, radiolarite, and erratic flint. A sidescraper with surface retouch is also on a thick radiolarite flake. No Hungarian raw materials occurred at the site, which makes the connection between the leaf points and the Hungarian Szeletian less probable.

Leaf points must have been imported to the site finished, as there are no flakes documenting their production or reparation at the site. Only associated industry consisting of sidescrapers made from opal/chalcedony was produced at the site.

5.3 Upper Palaeolithic, Aurignacian

Lithic industry with typical artefacts of the Aurignacian culture comes from Luhyňa I, Luhyňa II and Veľaty III. They are the first monuments of the Aurignacian from the vicinity of the Zemplín Hills. Luhyňa I is the largest assemblage of Aurignacian finds, consisting of 346 artefacts.

Aurignacian sites used local sources of raw materials – opal/chalcedony (Luhyňa I and II) as well as obsidian (Veľaty III), limnosilicite, or jasper.

Technologically, the assemblages are characterised by blade and flake debitage. Single-platform cores prevail; they include two prismatic single-platform bladelet cores. Volumetric double-platform cores and cores with changed orientation were less frequent. In terms of typology, the industry can be classified

as the Middle Aurignacian, whose typical tools are carinated endscrapers and dihedral burins made on thick flakes. Blade and flake endscrapers appear as well. Endscrapers outnumber burins in Luhyňa I. Most dihedral burins on flakes, including polyhedral, were made from opal/chalcedony. They are complemented with transverse burins from obsidian.

Endscrapers are present in Luhyňa II and Veľaty III, but burins were not recorded. Blades are only a small portion of the inventories. More frequent sidescrapers are also found. Borers, raclettes, and retouched blades occur in small numbers. The reduction of artefacts at settlements is demonstrated by many flakes, fragments, and chips as well as cores and their residues or raw material. The sites of Luhyňa I and Veľaty III were seasonal campsites producing industry in their areas.

Luhyňa II is a site in the immediate vicinity of opal/chalcedony sources. According to the composition of the industry, the site was used for testing raw materials of poor quality to find out whether they are suitable for production of industry. The industry contains mainly cores, their residues, fragments with striking scars, and chunks of raw material. Three volumetric prismatic single-platform cores were reduced from raw material chunks of higher quality. An atypical double carinated endscraper is the only tool found. The composition of the assemblage suggests a workshop processing the raw material right at its source.

No organic material suitable for dating has been obtained from the sites. The composition of the inventories is close to those from the Košická kotlina Basin (Chu et al. 2018). Samples for OSL dating were taken from the site of Seňa I, with the result of 33.5±2.4 ka (Chu et al. 2020, 92). This dating can be considered relevant for most of the Middle Aurignacian settlement in the Košická kotlina Basin and for industries with diagnostic Aurignacian tools from Luhyňa I and II and from Veľaty III near the Zemplín Hills.

5.4 Upper Palaeolithic, Epigravettian

The assemblages of Epigravettian industry from the sites of Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B and Veľaty III are indistinct and contain few tools. They are made mostly from local obsidian, which is a typically prevailing raw material in the Epigravettian assemblages in eastern Slovakia (Bánesz et al. 1992, 8; Kaminská 1995b). Local liminosilicite and opal/chalcedony are documented in small numbers; as for regional raw materials, there are silicified sandstones, menilite cherts, and radiolarites. The patinated flints are probably erratic flints from the territory of Silesia (Přichystal 2009).

The technological composition of the industries includes cores, flakes, blades, and tools. The cores are represented by single-platform shapes for blades and bladelets. The blades have mostly been preserved in fragments. The exceptions are two neo-crested blades from obsidian found at Veľaty III. There were few tools discovered. There were only three flake endscrapers and two burins – one on truncation made from obsidian and one atypical, made from opal/chalcedony. There were also six retouched blades. A bladelet with pearl retouch on both edges, with a broken distal end, was also discovered. It was made from obsidian and was found at Čerhov II – Pod Hečkou B.

The raw material as well as technological-typological composition of the industry allows its comparison with Epigravettian sites in the region. The relatively small number of artefacts at individual sites partly corresponds to the conditions of their recovery by collection from ploughed fields. It might have also been caused by the fact that the sites were seasonal campsites with a very short presence of a group of people carrying out housework and taking part of the industry with them as they left.

5.5 Neolithic/Eneolithic – Early Bronze Area

The industry from the Neolithic/Eneolithic to the Early Bronze Age was found at the sites of Veľká Tŕňa – Hečka, Luhyňa I and Veľaty III. Its more precise classification into any of the cultures is not possible, because pottery sherds were not found.

The blade chipped stone industry is almost entirely made of obsidian. In small quantities, opal/chalcedony, limnosilicite and flint, probably Krakow Jurassic flint from Poland, were found.

A total of fifteen single-platform cores or their residues made of obsidian were found.

There were only three blades. The toolkit is represented by two retouched blade endscrapers and one flake endscraper, retouched blades, obsidian flakes and one obsidian notch.

The obsidian arrowheads from Luhyňa I and Veľaty III with surface retouch, shaped by pressure, might be associated with the Košťany or Otomani-Füzesabony cultures.

It is possible that the artefacts belong to multiple cultures and were a result of their later mixing. Several shapes, mainly miniature cores and flakes with partial surface retouch shift them to the Eneolithic rather than Neolithic.

Acknowledgement

This article was supported by the project VEGA 2/0056/22 ‘Strategy of settlement of eastern Slovakia in the context of the prehistoric development of northern Tisza region’.

Translation by Viera Tejbusová

References

Adams, B., Ringer, Á. 2004: New C^{14} dates for the Hungarian Early Upper Palaeolithic. *Current Anthropology* 45, 541–550. DOI: 10.1086/423499. Available also from: https://doi.org/10.1086/423499.

Allard, P., Klaric, L., Hromadová, B. 2017: Obsidian blade debitage at Kašov-Čepegov I (Bükk culture), Slovakia [online]. *Be-Ja Bulgarian e-Journal of Archaeology* 7, 17–35. DOI: 10.57573/be-ja.7.17-35. [Accessed 2026-02-11]. Available from: https://be-ja.org/index.php/journal/article/view/be-ja-7-1-2017-17-35.

Allsworth-Jones, P. 2004: The Szeletian revisited. *Anthropologie* XLIII(3), 281–296. Available also from: http://puvodni.mzm.cz/Anthropologie/downloads/articles/2004/Allsworth-Jones_2004_p281-296.pdf.

Andel, K. 1955: Výsledok archeologického prieskumu na Zemplínsko-užskej nížine v rokoch 1953/54. *Vlastivedný zborník* I, 144–171.

Atlas 1980: *Atlas Slovenskej socialistickej republiky*. Bratislava: Slovenská akadémia vied, Slovenský úrad geodézie a kartografie.

Bačo, P., Baláž, P., Čechovská, K., Derco, J., Fischerová, R., Kovaničová, Ľ., Repčiak, M., Turček, Ľ., Vancáková, M. 2003: *Obsidiánová industria – prehistorické sídliská Hraň, Cejkov, Zemplín. 45. Fórum pre nerudy. Sprievodca*. Košice, Viničky.

Bačo, P., Kaminská, Ľ., Lexa, J., Pécskay, Z., Bačová, Z., Konečný, V. 2017: Occurrences of neogene volcanic glass in the Eastern Slovakia – raw material source for the stone industry. *Anthropologie* LV(1–2), 207–230. Available also from: http://puvodni.mzm.cz/Anthropologie/downloads/articles/2017/Baco_2017_p207-230.pdf.

Bánesz, L. 1958a: Mladopaleolitické objekty v Seni I (Výsledky zisťovacieho výskumu r. 1955). *Slovenská archeológia* VI(1), 5–20. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1958_1.pdf.

Bánesz, L. 1958b: Listovité hroty z Tibavy. *Archeologické rozhledy* X(4), 461–465. Available also from: https://1url.cz/EeGQA.

Bánesz, L. 1959a: Problematický stredopaleolitický nález zo severovýchodného Slovenska. *Študijné zvesti Archeologického ústavu SAV* 3, 131–132. Available also from: https://cevnad.sav.sk/aktivita_1_1/SZ_03.pdf.

Bánesz, L. 1959b: Paleolitické stanice pri Kechneci. *Slovenská archeológia* VII(2), 205–240. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1959_2.pdf.

Bánesz, L. 1960a: Die Problematik der paläolithischen Besiedlung in Tibava. *Slovenská archeológia* VIII(1), 7–58. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1960_1.pdf.

Bánesz, L. 1960b: K otázke listovitých hrotov z Veľkého Šariša. *Archeologické rozhledy* XII(3), 313–318. Available also from: https://1url.cz/seGWJ.

Bánesz, L. 1961: Prehľad paleolitu východného Slovenska. *Slovenská archeológia* IX(1), 33–48. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1961_1_2.pdf.

Bánesz, L. 1968: *Barca bei Košice – Paläolithische Fundstelle*. Bratislava: Vydavateľstvo Slovenskej akadémie vied.

Bánesz, L. 1991: Neolitická dielňa na výrobu obsidiánovej industrie v Kašove. *Východoslovenský pravek* III, 39–68. Available also from: https://1url.cz/CelWS.

Bánesz, L. 2000: Recherches en Préhistoire au pied du Haut-Tatra. In: Z. Mester, A. Ringer (eds.): *À la recherche de l'Homme Préhistorique*. ERAUL 95. Liège: Service de Préhistoire, Université de Liège, 55–68.

Bánesz, L., Hromada, J., Desbrosse, R., Margerand, I., Kozłowski, J. K., Sobczyk, K., Pawlikowski, M. 1992: Le site de plein air du Palélothique supérieir de Kašov I en Slovaquie orientale. *Slovenská archeológia* XL(1), 5–28. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1992_1.pdf.

Bánesz, L., Kaminská, Ľ. 1984: Výskum archeologickej lokality v Hrčeli. *Historica Carpatica* 15, 255–281.

Bánesz, L., Vizdal, M. 1995: Poznámky k interpretácii listovitých hrotov z Veľkého Šariša. *Archeologické výskumy a nálezy na Slovensku v roku* 1993. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1993.pdf.

Bárta, J. 1965: *Slovensko v staršej a strednej dobe kamennej*. Bratislava: Vydavateľstvo Slovenskej akadémie vied.

Bárta, J. 1980: Stredopaleolitické nálezy na Mariánskom vŕšku v Prievidzi. *Horná Nitra* 9, 31–51.

Bárta, J. 1984: Nové paleolitické nálezy zo severovýchodného Slovenska. *Archeologické rozhledy* XXXVI(4), 443–445. Available also from: https://1url.cz/3eGTy.

Bárta, J. 1986: On problems of the Middle Palaeolithic in Slovakia. *Slovenská archeológia* XXXIV(2), 279–291. Available also from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1986_2.pdf.

Bárta, J., Mačala, P. 1990: Ojedinelé stredopaleolitické artefakty z vranovského okresu. *Historica Carpatica* 21, 101–106.

Bárta, J., Wiedermann, E. 1980: Nové stredopaleolitické nálezisko v Žiarskej kotline. *Archeologické výskumy a nálezy na Slovensku v roku* 1979, 32–33. Available also from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1979.pdf.

Biró, K. T. 1984: Distribution of obsidian from the Carpathian sources on Central European Palaeolithic and Mesolithic sites. *Acta Archaeologica Carpathica* 23, 5–42.

Bohmers, A. 1951: *Die Höhlen von Mauern I. Kulturgeschichte der Altsteinzeitlichen Besiedlung*. Paleohistoria 1. Groningen: University of Groningen Press. Available also from: https://ugp.rug.nl/Palaeohistoria/article/view/24760/22208.

Bolus, M. 2004: Der Übergang vom Mittel zum Jungpaläolithikum in Europa. Eine Bestandaufnahme unter besonders Berücksichtigung Mitteleuropas. *Germania* 82(1), 1–54. DOI: 10.11588/ger.2004.69198. Available also from: https://doi.org/10.11588/ger.2004.69198.

Bolus, M., Rück, O. 2000: Eine Blattspitze aus Wittislingen, Lkr. Dillingen a. d. Donau (Bayern). Zur südwestlichen Verbreitungsgrenze spätmittelpaläolithischer Blattspitzeninventare. *Archäologisches Korrespodenzblatt* 30(2), 165–172.

Bosinski, G. 1967: *Die mittelpaläolithische Funde im westlichen Mitteleuropa*. Fundamenta A/4. Köln: Universität zu Köln, Institut für Ur- und Frühgeschichte.

Budek, A., Kalicki, T., Kaminská, Ľ., Kozłowski, J. K., Mester, Z. 2013: Interpleniglacial profiles on open-air sites in Hungary and Slovakia. *Quaternary International* 294, 82–98. DOI: 10.1016/j.quaint.2012.02.022.

Chmielewski, W. 1961: *Civilisation de Jerzmanowice*. Wrocław: Zakład Narodowy im. Ossolinskich.

Chu, W. 2018: The Danube Corridor Hypothesis and the Carpathian Basin. Geological, Environmental and Archaeological Approaches to Characterizing Aurignacian Dynamics. *Journal of World Prehistory* 31(2), 117–178. DOI: 10.1007/s10963-018-9115-1. Available also from: https://doi.org/10.1007/s10963-018-9115-1.

Chu, W., Kaminská, Ľ., Klasen, N., Zeeden, C., Lengyel, G. 2020: The Chronostratigraphy of the Aurignacian in the Northern Carpathian Basin Based on New Chronometric/Archeological Data from Seňa I (Eastern Slovakia). *Journal of Palaeolithic Archaeology* 3, 77–96. DOI: 10.1007/s41982-019-00044-2. Available also from: https://doi.org/10.1007/s41982-019-00044-2.

Chu, W., Lengyel, G., Zeeden, C., Péntek, A., Kaminská, Ľ., Mester, Z. 2018: Early Upper Palaeolithic surface collections from loess-like sediments in the northern Carpathian Basin. *Quaternary International* 485, 167–182. DOI: 10.1016/j.quaint.2017.05.017.

Demidenko, Yu. E., Rácz, B., Nemergut, A. 2020: Proto-Aurignacian unique site cluster in Europe. Logistic Settlement Pattern with a Base Camp and a Series of Supply Chain Loci at Raw Material Outcrops in Transcarpathia (Ukraine). *Slovenská archeológia* LXVIII(2), 193–218. DOI: 10.31577/slovarch.2020.68.10. Available also from: https://doi.org/10.31577/slovarch.2020.68.10.

Demidenko, Yu. E., Škrdla, P. 2023: The Lincombian-Ranisian-Jerzmanowician with new sites in South Moravia and the Inicial Upper Palaeolithic record of East-Central Europe. In: A. Király (ed.): *From tea leaves to leaf-shaped tools. Studies in honour of Zsolt Mester on his sixtieth birthday*. Budapest: Lithic Research Rountable, Institute of Archaeological Sciences. ELTE Eötvös Loránd University, 95–119. DOI: 10.23898/litikumsi02a05. Available also from: https://doi.org/10.23898/litikumsi02a05.

Demidenko, Yu. E., Škrdla, P., Béres, S., Rácz, B., Nemergut, A. 2022: The Middle Aurignacian in the Carpathian Basin of Eastern Central Europe. *Slovenská archeológia* LXX(2), 189–255. DOI: 10.31577/slovarch.2022.70.11. Available also from: https://doi.org/10.31577/slovarch.2022.70.11.

Demidenko, Yu. E., Škrdla, P., Nejman, L. 2017: Aurignacian in Moravia. New geochronological, lithic and settlement data. *Památky archeologické* CVIII, 5–38. Available from: https://1url.cz/heGjH.

Dobosi, V. T. 2008: Acsa: New open-air Aurignacian site in Hungary. In: J. Sulgostowska, A. J. Tomaszewski (eds.): *Man – Millennia – Environment. Studies in honour of Romuald Schild*. Warszawa: Institut of Archaeology and Ethnology Polish Academy of Sciences, 151–159.

Dobosi, V. 2008–2009: Leaf points in non-szeletian context. *Praehistoria* 9–10, 71–79.

Ďuďa, R. 1996: Slovenské opály. *Minerál* IV, 254–258.

Ďuďa, R., Ozdín, D. 2012: *Minerály Slovenska*. Praha: GRANIT.

Ďuďa, R., Peterec, D., Bačo, P. 1985: *Slovensko – drahé a ozdobné kamene*. Manuscript of excavation report No. 178/86. Stored in: Regionálna geologická služba, Spišská Nová Ves.

Flas, D. 2011: The Middle to Upper Paleolithic transition in Northern Europe. The Lincombian-Ranisian-Jerzmanowician and the issue of aculturation of the last Neanderthals. *World Archaeology* 43(4), 605–627. DOI: 10.1080/00438243.2011.624725.

Harčák, J., Kaminská, Ľ., Kazior, B., Kaczanowska, M., Kozłowski, J. K., Nowak, M., Pawlikowski, M., Vizdal, M. 1996: Lithic Raw Materials from the Slanské Moutains, Eastern Slovakia. *Acta Archaeologica Carpathica* 33, 5–23.

Hauck, T. C., Rethemeyer, J., Rentzel, P., Schulte, P., Heinze, S., Ringer, Á., Richter, J., Chu, W., Lehmkuhl, F., Vogels, O. 2016: Neanderthals or Early Modern Humans? A revised ^{14}C chronology and geoarchaeological study of the Szeletian sequence in Szeleta Cave (Kom. Borsod-Abaúj-Zemplén) in Hungary. *Archäologisches Korrespondenzblatt* 46(3), 271–290.

Horváthová, E., Jarosz, P. 2023: *Michaľany: Gačina, Mohyla 1 a 2*. Manuscript of excavation report No. 21040. Stored in: Archív nálezových správ, Archeologický ústav SAV Nitra.

Inizan, M. L., Reduron-Ballinge, M., Roche, H., Tixie, J. 1999: *Technology and Termonology of Kanpped Stone*. Préhistoire de le Pierre Taillée 5, Nanterre: Crep.

Janšák, Š. 1935: *Praveké sídliská s obsidiánovou industriou na východnom Slovensku*. Bratislava: Tlačou Jána Pociska a spol.

Jarosz, P., Horváthová, E., Szczepanek, A. 2024: Výzkum mohyl z Východoslovenské nížiny v letech 2023–2024. In: P. Schindlerová et al. (eds.): *Otázky neolitu a eneolitu našich zemí. 43. ročník odborné archeologické konference, Praha, 25. 9. – 27. 9. 2024. Kniha abstraktů*. Praha: Muzeum hlavního města Prahy, 45–46.

Javorský, F. 1980: Výskumy a prieskumy Výskumnej expedície Archeologického ústavu SAV na Spiši. *Archeologické výskumy a nálezy na Slovensku v roku* 1978, 123–131. Available from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1978.pdf.

Jöris, O. 2004: Zur chronostratigraphischen Stellung der spät-mittelpaläolithischen Keilmessergruppen. Der Versuch einer kulturgeographischen Abgrenzung einer mittelpaläolithischen Formengruppe in ihrem europäischen Kontext. *Bericht der Römisch-Germanischen Kommission* 84, 51–153.

Jöris, O., Neruda, P., Wiśniewski, A., Weiss, M. 2022: The Late and Final Middle Palaeolithic of centrale Europe and Its Contributions to the Formation of the Regional Upper Palaeolithic. A Review and a Synthesis [online]. *Journal of Paleolithic Archaeology* 5, article no. 17, 1–55. DOI: 10.1007/s41982-022-00126-8. [Accessed 2026-02-15]. Available from: https://doi.org/10.1007/s41982-022-00126-8.

Kaczanowska, M. 1985: *Rohstoffe Technik und Typologie der neolithischen Feuersteinindustrien im Nordteil des Flussgebietes der Mitteldonau*. Warszawa: Panstwowe Wydawnictwo Naukowe.

Kaczanowska, M., Kozłowski, J. K. 1991: *Spaltindustrie der Lengyel-Kultur aus Svodín, Slowakei*. Kraków: Uniwersytet Jagiellońskiego.

Kaminská, Ľ. 1985: Nový nález listovitého hrotu z východného Slovenska. *Archeologické rozhledy* XXXVII(2), 195–197. Available from: https://1url.cz/WeGjP.

Kaminská, Ľ. 1986a: Doklady mladopaleolitického osídlenia Veľat. *Archeologické rozhledy* XXXVIII(6), 601–608. Available from: https://1url.cz/ReGjY.

Kaminská, Ľ. 1986b: Osídlenie Hrčeľa v staršej dobe kamennej. *Historica Carpatica* 17, 217–241.

Kaminská, Ľ. 1987: Príspevok k osídleniu Hrčeľa v mladšej a neskorej dobe kamennej. *Archeologické rozhledy* XXXIX(5), 481–506. Available from: https://1url.cz/heGj8.

Kaminská, Ľ. 1990: Aurignacké stanice v Čečejovciach. *Archeologické rozhledy* XLII(1), 3–12. Available from: https://1url.cz/xeGjx.

Kaminská, Ľ. 1991: Význam surovinovej základne pre mladopaleolitickú spoločnosť vo východokarpatskej oblasti. *Slovenská archeológia* XXXIX(1), 7–58. Available from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1991_1_2.pdf.

Kaminská, Ľ. 1995a: Archaeological data from the Middle Palaeolithic Locality at Hôrka-Ondrej. 128–131. In: J. Kovanda et al.: The Skalka travertine mound at Hôrka-Ondrej near Poprad (Slovakia). *Antropozoikum* 22, 113–140. Available also from: http://www.geology.cz/sbornik/antropozoikum/no22/22-4-The_skalka.pdf.

Kaminská, Ľ. 1995b: *Katalóg štiepanej kamennej industrie z Hrčeľa--Pivničiek a Veľat*. Informátor Slovenskej archeologickej spoločnosti pri SAV, Suplement 4. Nitra: Slovenská archeologická spoločnosť pri SAV a Archeologický ústav SAV.

Kaminská, Ľ. 1999: Travertínová lokalita Hôrka v kontexte stredopaleolitického osídlenia Slovenska. *Slovenská archeológia* XLVII(2), 1999, 1–36. Available from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1999_2.pdf.

Kaminská, Ľ. 2003: Úloha prírodného prostredia pri formovaní paleolitického osídlenia severného okraja Východoslovenskej nížiny. *Východoslovenský pravek* VI, 9–43. Available from: https://archeol.sav.sk/files/V%C3%BDchodoslovenk%C3%BD-pravek-6_zmenseny.pdf.

Kaminská, Ľ. 2004: The Middle Palaeolithic settlements at the Skalka mound at Hôrka-Ondrej near Poprad (Slovakia). In: E. Fülöp, J. Cseh: *Die aktuellen Fragen des Mittelpaläolithikums in Mitteleuropa". Tudományos füzetek 12. 20–23 October 2003*. Tudományos füzetek 12. Tata: Komárom-Esztergom County Museum Directorate, 191–220.

Kaminská, Ľ. 2010a: Príspevok k poznaniu micoquienu na Slovensku. In: I. Fridrichová-Sýkorová (ed.): *Ecce Homo. In memoriam Jan Fridrich*. Knižnice České společnosti archeologické. Praha: Krigl, 90–94.

Kaminská, Ľ. 2010b: *Čičarovce – Veľká Moľva. Výskum polykultúrneho sídliska*. Archaeologica Slovaca Monographiae XII. Nitra: Archeologický ústav SAV.

Kaminská, Ľ. 2013: Sources of raw materials and their use in the Palaeolithic of Slovakia. In: Z. Mester (ed.): *The lithic raw material sources and interregional human contacts in the Northern Carpathian regions. Papers for the project funded by the International Visegrad fund Standard grant no 21110211*. Kraków, Budapest: Polish Academy of Arts and Sciences, Institute of Archaeological Sciences of the Eötvös Loránd University, 99–110.

Kaminská, Ľ. 2018: Use of obsidian from Palaeolithic to the Bronze age in Slovakia. *Archaeometriai Műhely* XV(3), 197–212. Also available from: http://www.ace.hu/am/2018_3/AM-2018-3-LK.pdf.

Kaminská, Ľ. 2021: Use of obsidian in Slovak prehistory. In: A. Nemergut (ed.): *Fossile directeur. Multiple perspectives on lithic studies in Central and Eastern Europe*. Študijné zvesti Archeologického ústavu SAV, Supplementum 2. Nitra: Archeologický ústav SAV, 231–250. DOI: 10.31577/szausav.2021.suppl.2.15. Available also from: https://www.sav.sk/journals/uploads/1220212015_Kaminska_zmenseny.pdf.

Kaminská, Ľ. 2025: Obsidiánové hroty šípov z okolia Zemplínskych vrchov. *Zborník Slovenského národného múzea* CXIX, *Archeológia* 35, 35–44. DOI: 10.55015/JJJS5880. Available also from: https://www.archeologickemuzeum.sk/swift_data/source/archeologicke_muzeum/zborniky/z35/03-Kaminska.pdf.

Kaminská, Ľ., Cheben, I. 1983: Výsledky prieskumov na Východoslovenskej nížine. *Archeologické nálezy a výskumy v roku* 1982, 128–130. Available from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1982.pdf.

Kaminská, Ľ., Chu, W., Verpoorte, A. 2024: Výsledky rádiokarbónového datovania uhlíkov zo starých výskumov v Košiciach-Barci I a Košiciach-Barci II. *Študijné zvesti Archeologického ústavu SAV* 71(1), 1–15. DOI: 10.31577/szausav.2024.71.1. Available also from: https://doi.org/10.31577/szausav.2024.71.1.

Kaminská, Ľ., Ďuďa, R. 1985: K otázke významu obsidiánovej suroviny v paleolite Slovenska. *Archeologické rozhledy* XXXVII(2), 1985, 121–129. Available from: https://1url.cz/AeGdo.

Kaminská, Ľ., Kozłowski, J. K., Kazior, B., Pawlikowski, M., Sobczyk, K. 2000: Long term stability of raw materials procurement systems in the Middle and Upper Palaeolithic of Eastern Slovakia: a case study of the Topla/Ondava river valleys. *Praehistoria* 1, 63–81.

Kaminská, Ľ., Kozłowski, J. K., Sobczyk, K., Svoboda, J. A., Michalík, T. 2008: Štruktúra osídlenia mikroregiónu Trenčína v strednom a mladom paleolite. *Slovenská archeológia* LVI(2), 179–238. Available from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_2008_2.pdf.

Kaminská, Ľ., Pelisiak, A. 1991: Štiepaná kamenná industria skupiny Tiszapolgár-Csöszhalom – Oborín z Hrčeľa. *Východoslovenský pravek* III, 26–38. Available from: https://archeol.sav.sk/files/V%C3%BDchodoslovensk%C3%BD-pravek-3_zmenseny.pdf.

Kaminská, Ľ., Škrdla, P., Kozłowski, J. K., Tomášková, S. 2009: Nižný Hrabovec: a site with evolved Levallois technology in Eastern Slovakia. *Eurasian Prehistory* 6(1–2), 57–64.

Kerekes, D., Cserpák, F., Mester, Z. 2024: A Middle Palaeolithic workshop ar Andornaktálya-Marinka site (Northeast Hungary). *Archaeologiai Értesítő* 149(1), 83–103. DOI: 10.1556/0208.2024.00085.

Kobulský, J., Bačo, P., Maglay, J. 2014: Základné informácie o geologickej stavbe Zemplínskych vrchov a ich okolia. In: J. Kobulský (ed.): *Sprievodca ku geologicko-náučnej mape Zemplínskych vrchov 1: 50 000*. Bratislava: Štátny geologický ústav Dionýza Štúra, Ministerstvo životného prostredia, 5–15.

Konoplya, V. 1998: Klasifikatsiya krem'yanoi sirovini zakhodu Ukraini. *L'vivsk'y Istoritchny Muzei – Naukovi Zapiski* 7, 139–157.

Kopacz, J., Valde-Nowak, M. 1987: Episznurowy przykarpacki krąg kulturowy w świetle materiałow kamiennych. *Archeologia Polski* 32, 55–92.

Kozłowski, J. K., Pawlikowski, M. 1989: Investigations into the Northern Lithic Raw Materials in Upper Silesia. In: J. K. Kozłowski (ed.): *Northern (erratic and jurassic) flint of South Polish origin in the Upper Paleolithic of Central Europe*. Kraków: Uniwersytet Jagielloński Instytut Archeologii, 17–46.

Kozłowski, J. K., Mester, Z. 2003–2004: Un nouveau site su Paléolithique supérieur dans la région d´Eger (Nord-east de la Hongrie). *Praehistoria* 4–5, 109–140.

Kozłowski, J. K., Mester, Z., Budek, A., Kalicki, T., Moskal-del Hoyo, M., Zandler, K., Béres, S. 2012: La mise en valeur d'un ancien site éponyme: Eger-Kőporos dans le Paléolithique moyen et supérieur de la Hongrie du nord. *L´Anthropologie* 116(2), 405–465. DOI: 10.1016/j.anthro.2012.05.004.

Kozłowski, J. K., Mester, Z., Zandler, K., Budek, A., Kalicki, T., Moskal, M., Ringer, Á. 2009: Le Paléolithique moyen et supérieur de la Hongrie du nord: nouvelles investigations dans la région d´Eger. *L´Antropologie* 113(2), 399–453. DOI: 10.1016/j.anthro.2009.04.005.

Lengyel, G., Béres, S., Fodor, L. 2006: New lithic evidence of the Aurignacian in Hungary. *Eurasian Prehistory* 4(1–2), 79–85. Available also from: https://real.mtak.hu/3602/1/1071129.pdf.

Lengyel, G., Mester, Z. 2008: A new look at the radiocarbon chronology of the Szeletian in Hungary. *Eurasian Prehistory* 5(2), 73–83.

Markó, A. 2011: Raw material use at the Middle Palaeolithic site of Vanyarc (Northern Hungary). *Praehistoria* 9–10, 183–194.

Markó, A. 2016: Consideration on the lithic assemblages from the Szeleta cave. *Communicationes Archaeologicae Hungariae*, 5–44. DOI: 10.54640/CAH.2016.5. Available also from: https://doi.org/10.54640/CAH.2016.5.

Markó, A., Péntek, A., Béres, S. 2002: Chipped stone assemblages from the environs of Galgagyörk (Northern Hungary). *Praehistoria* 3, 245–257.

Mester, Z. 2010: Technological analysis of Szeletian bifacial points from Szeleta Cave (Hungary). *Human evolution* 25(1–2), 107–124.

Mester, Z. 2014: Technologie des piéces foliacées bifaces du Paléolithique moyen et supérieur de la Hongrie. In: K. T. Biró et al. (eds.): *Aeolian scripts new ideas on the lithic world studies in honour of Viola T. Dobosi*. Budapest: Magyar Nemzeti Múzeum, 41–62.

Mester, Z. 2018: The problems of the Szeletian as seen from Hungary. *Recherches Archéologiques* 9, 19–48. DOI: 10.33547/RechACrac.NS9.02.

Mester, Z. 2021: What about the Szeletian leaf point as fossil directeur. In: A. Nemergut (ed.): *Fossile directeur. Multiple perspectives on lithic studies in Central and Eastern Europe*. Študijné zvesti Archeologického ústavu SAV, Supplementum 2. Nitra: Archeologický ústav SAV, 49–62. DOI: 10.31577/szausav.2021.suppl.2.4. Available also from: https://doi.org/10.31577/szausav.2021.suppl.2.4.

Mester, Z., Kozłowski, J. K., Kalicki, T., Dobos, A., Frączek, M., Zandler, K., Gutay, M., Béres, S., Cserpák, F. 2021: Nouveax assemblages du Paléolithique supérieur ancien en Hongrie du nord dans le contexte de l´hypothèse du Couloir danubien [online]. *L´Anthropologie* 125(4), 102914. DOI: 10.1016/j.anthro.2021.102914. [Accessed 2026-02-15]. Available from: https://www.sciencedirect.com/science/article/abs/pii/S0003552121001126?via%3Dihub.

Mester, Z., Szolyák, P., Lengyel, G., Ringer, Á. 2013: SzeleStra: új rétegtani kutatások a Szeletien kultúra névadó lelőhelyén. *Litikum – Journal of the Lithic Research Roundtable* 1, 60–65. DOI: 10.23898/litikuma0005.

Michel, J. 1971: Ložiská štrkopieskov na Slovensku. *Mineralia slovaca* 3, 513–524.

Mišík, M. 1975: Petrograficko-mikropaleontologické kritéria pre zisťovanie proveniencie silicitových nástrojov na Slovensku. *Folia Facultatis Scientiarum Naturalium Universitatis Brunensia XVI. Geologia* 27, 89–107.

Nemergut, A., Cheben, M., Pyžewicz, K. 2022: Kamenná industria z sídliska ludanickej skupiny v Nitre-Chrenovej, poloha Selenec. In: M. Gabulová (ed.): *Sídlisko ludanickej skupiny v Nitre-Chrenovej, poloha Selenec*. Nitra: Archeologický ústav SAV, v. v. i., 189–212. Available from: https://cevnad.sav.sk/aktivita_1_1/NR_Selenec.pdf.

Neruda, P. 2011: *Střední paleolit v moravských jeskyních*. Dissertationes archaeologicae Brunenses/Pragensesque 8. Brno: Masarykova univerzita.

Neruda, P. 2016: *Čas neandertálců. Time of Neanderthals*. Brno: Moravské zemské muzeum, Ústav Anthropos.

Neruda, P. 2021: Decostructing the Middle/Upper Palaeolithic transition in Moravia (Czech Republik). In: S. Gaudzinski-Windheuser, O. Jöris (eds.): *The beef behind all possible pasts. The Tandem-Festschrift in honour of Elaine Turner and Martin Street*. Monographien des Römisch-Germanischen Zentralmuseums 157. Mainz: Römisch-Germanischen Zentralmuseum, 211–228. DOI: 10.11588/propylaeum.868.

Neruda, P., Kaminská, Ľ. 2013: *Neanderthals at Bojnice in the context of Central Europe*. Studies in Anthropology, Palaeoethnology, Palaeontology and Quaternary Geology 36. Brno, Nitra: Moravské zemské muzeum, Ústav Anthropos.

Neruda, P., Nerudová, Z. 2005: The development of the production of lithic industry in the Early Upper Palaeolithic of Moravia. *Archeologické rozhledy* LVII(2), 263–292. Available from: https://1url.cz/NeGSD.

Neruda, P., Nerudová, Z. 2009: *Moravský Krumlov IV – vícevrstvová lokalita ze středního a počátku mladého paleolitu na Moravě*. Studies in Anthropology, Palaeoethnology, Palaeontology and Quaternary Geology 29. Brno: Moravské zemské muzeum.

Nerudová, Z., Neruda, P., Sadovský, P. 2011: Srovnávací analýza paleolitických bifaciálních artefaktů. *Památky archeologické* CII, 21–58. Available from: https://1url.cz/guypr.

Olexa, L., Nováček, T. 2013: *Pohrebisko zo staršej doby bronzovej v Nižnej Myšli. Katalóg 1* (*hroby 1-310*). Archaeologica Slovaca Monographiae. Catalogi. Tomus XIV. Nitra: Archeologický ústav SAV.

Olexa, L., Olšav, Š., Szabová, T. 2021: Vybrané doklady remeselnej činnosti na opevnenom sídlisku II v Nižnej Myšli. *Slovenská archeológia* 69(2), 217–257. Available from: https://archeol.sav.sk/files/SlA_2021_69_2.pdf.

Oliva, M. 1991: The Szeletian in Czechoslovakia. *Antiquity* 65(247), 318–325. DOI: 10.1017/S0003598X00079825.

Oliva, M. 2016: *Encyklopedie paleolitu a mezolitu českých zemí*. Brno: Moravské zemské muzeum.

Oliva, M. 2021: Centrální mladopaleolitická stanice Miškovice I na východní Moravě. *Acta Musei Moraviae, Scientiae sociales* 106(2), 177–224.

Pastor, J. 1962: Pohrebisko zo staršej doby bronzovej v Košťanoch. *Študijné zvesti Archeologického ústavu SAV* 9, 63–79. Available from: https://cevnad.sav.sk/aktivita_1_1/SZ_09.pdf.

Pástor, J. 1969: *Košické pohrebisko*. Košice: Východoslovenské múzeum.

Pástor, J. 1978: *Čaňa a Valaliky – pohrebiská zo staršej doby bronzovej*. Košice: Východoslovenské múzeum.

Pelegrin, J. 2000: Les technique de débitage laminaire au Tardiglaciaire: critères de diagnose et quelques réflexions. L'Europe Centrale et Septentrionale au Tardiglaciaire. Table-ronde de Nemours, 13 - 16 mai 1997. *Mémoire du Musée de Préhistoire d´Ile de France* 7, 73–86.

Péntek, A. 2015: Open-air site complex with leaf-points at Szécsénke (Cserhát Mountains, Northern Hungary). *Litikum – Journal of the Lithic Research Roundtable* 3, 46–69. DOI: 10.23898/litikuma0012.

Péntek, A., Zandler, K., Guba, Sz., Larsson, N. 2024: Upper Palaeolithic site complex at Csécse-Szőlős-domb (Cserhátalja, Nógrád Country, Northern Hungary). Preliminary results. *Dissertationes Archaeologicae* 3(12), 41–69. DOI: 10.17204/DISSARCH.2024.41.

Popovičová, L., Beljak Pažinová, N. 2025: Obsidián treatment technology in the Lengyel culture. Casy study on the settlement of Kiarov-Veľké ortovisko site (South Slovakia). *Dokumenta Praehistorica* 52, 2–17. DOI: 10.4312/dp.52.6. Available also from: https://journals.uni-lj.si/DocumentaPraehistorica/issue/view/1442/1364.

Prošek, F. 1953: Szeletien na Slovensku. *Slovenská archeológia* I, 133–194. Available from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1953_1.pdf.

Prošek, F. 1955: Paleolitické sídelní objekty na nálezišti Barca I. *Archeologické rozhledy* VII(6), 721–729. Available also from: https://1url.cz/2eG0M.

Prošek, F. 1956: Paleolitická stanice Barca II. *Archeologické rozhledy* VIII(3), 305–311, 337–339. Available also from: https://1url.cz/deG0z.

Přichystal, A. 2009: *Kamenné suroviny v pravěku východní části střední Evropy*. Brno: Masarykova univerzita.

Přichystal, A., Škrdla, P. 2014: Kde ležel hlavní zdroj obsidiánu v pravěku střední Evropy? *Slovenská archeológia* LXII(2), 215–226. Available from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_2014_2.pdf.

Rácz, B. 2013: Main raw materials of the Palaeolithic in Transcarpathian Ukraine: geological and petrographical overview. In: Zs. Mester (ed.): *The lithic raw material sources and interregional human contacts in the Northern Carpathian regions*. Kraków, Budapest: Polish Academy of Arts and Sciences, Kraków, Institute of Archaeological Sciences of the Eötvös Loránd University, 131–146.

Richter, J. 1997: *Sesselfelsgrotte III: Der G-Schichten-Komplex der Sesselfelsgrotte*. Quartär-Bibliothek 7. Saarbrücken, Köln: Universität zu Köln. Institut für Ur- und Frühgeschichte.

Ringer, Á. 1983: *Bábonyien. Eine mittelpaläolitische Blattwerkzeugindustrie in Nordostungarn*. Dissertationes archaeologicae. Ser. II, No, 11. Budapest: Eötvös Loránd Tudományegyetem.

Ringer, Á. 2002: The new image of Szeleta and Istállós-kő caves in the Bükk Mountains: a Revision project between 1999–2000. *Praehistoria* 3, 47–52.

Ringer, Á. 2008–2009: Nouvelles données sur le Szélétien de Bükk. *Praehistoria* 9–10, 21–34.

Ringer, Á., Kordos, L., Krolopp, E. 1995: Le complexe Bábonien-Széletién en Hongrie du nord-est dans son cadre chronologique et environnemental. In: *Les industries à pointes foliacées d'Europe centrale: actes du colloque commémoratif international, Miskolc, 10-15 septembre* 1991. Paléo Revue d'Archéologie Préhistorique – Supplément 1. Miskolc: Université de Miskolc, 27–30. Available also from: https://www.persee.fr/doc/pal_1262-3075_1995_sup_1_1_1376.

Ringer, Á., Mester, Z. 2000: Résultats de la révision de la grotte Szeleta enterprise en 1999 et 2000. *Antropologie* XXXVIII(3), 261–270. Available also from: http://puvodni.mzm.cz/Anthropologie/downloads/articles/2000/Ringer_2000_p261-270.pdf.

Simán, K. 1990: Considerations on the „Szeletian unity". In: J. K. Kozłowski (ed.): *Feuilles de pierre. Les industries à pointes foliacées du Paléolithique supérieur européen. Actes du Colloque de Cracovie*. ERAUL 42. Liège: Université de Liège, 189–198.

Šiška, S. 1968: Tiszapolgárska kultúra na Slovensku. *Slovenská archeológia* XVI(1), 61–154. Available from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1968_1.pdf.

Šiška, S. 1991: Keramika a datovanie neolitickej dielne v Kašove. *Východoslovenský pravek* III, 69–74. Available from: https://1url.cz/CelWS.

Šiška, S. 1998: Obsidián v prostredí spoločenstiev doby kamennej na strednom a západnom Slovensku (súpis nálezísk). *Východoslovenský pravek* V, 63–90.

Šiška, S., Császta, J. 1980: Prieskum mikroregiónu v Čečejovciach. *Archeologické výskumy a nálezy na Slovensku v roku* 1979, 207–209. Available from: https://cevnad.sav.sk/aktivita_1_1/AVANS_v_roku_1979.pdf.

Škrdla, P. 2017: *Moravia at the Onset of the Upper Palaeolithic*. The Dolní Věstonice Studies 23. Brno: Academie of Sciences of the Czech Republic, Institute of Archaeology.

Stadler, P., Draxler, S., Friesinger, H., Kutschera, W., Priller, A., Rom, W., Steiner, P., Wild, E. 2000: *Status of the Austrian Science Funds Project P 12353-PHY „Absolute Chronology for Early Civilisations in Austria and Central Europe using 14C dating with Accelerator Mass Spectrometry"*. Manuskript. Stored in: Universität Wien.

Svoboda, J. A. 2006: The Aurignacian and after: chronology, geography and cultural taxonomy in the Middle Danube region. In: O. Bar-Yosef, J. Zilhão (eds.): *Towards a definition of the Aurignacian. Proceedings of the Symposium held in Lisbon, Portugal, June 25–30, 2002*. Trabahlos de Arqueologia 45. Lisboa: Instituto Português de Arqueologia, 259–267. Available also from: https://www.bristol.ac.uk/archanth/staff/zilhao/ta452006.pdf.

Svoboda, J. A., Bar-Yosef, O. (eds.) 2003: *Stránská skála. Origins of the Upper paleolithic in the Brno Basin, Moravia, Czech Republic*. American School of Prehistoric Research Bulletin 47. Dolní Věstonice studies 10. Cambridge: Peabody Museum of Archeology and Ethnology, Harvard University.

Tkachenko, V. I. 2003: *Pizniy paleolit Zakarpattya (pamyatky oriniakskoi tradytsiyi)*. Kyiv: Shlyakh.

Tunia, K. 2008: Słowacko polskie archeologiczne badania powierzchniowe w górnym dorzeczu Topli, Słowacja. In: J. Machnik (ed.): *Archeologia i środowisko naturalne Beskidu Niskiego w Karpatach. Część II. Kurimská brázda*. Prace Komisji Prehistorii Karpat IV. Kraków: Polska Akademia Umiejętności, 41–138.

Usik, V., Nigst, Ph., Haesaerts, P., Gerasimenko, N., Koulakovska, L., Rácz, B., Kromer, B., Hublin, J.-J. 2014: New data on the Early Upper Palaeolithic of Western Ukraine: chronology, environment and human behavior at the Aurignacian site of Berehovo I. In: *The origins of Upper Palaeolithic in Eurasia. XVII. World UISPP Congress 2014. Burgos, 1–7 September. Abstract Book*. Burgos, 227–228.

Valde-Nowak, P. 1986: Inventare des Orawa-Typus und ihre Bedeutung in der Bezeichnung der Besiedlung aus der Frühbronzezeit in den Karpaten. In: B. Chropovský (ed.): *Urzeitliche und Frühhistorische Besiedlung der Ostslowakei in Bezug zu den Nachbargebieten*. Nitra: Archäologisches Institut der Slowakischen Akademie der Wissenschaften, 115–123.

Valoch, K. 1988: *Die Erfoschung der Kůlna-Höhle 1961–1976*. Anthropos. Studien zur Anthropologie, Paläoethnologie, Paläontologie und Quartärgelogie. Band 24, N. S. 16. Brno: Moravské muzeum, Anthropos Institut. Available from: https://1url.cz/2elWA.

Valoch, K. 1990: La Moravie il y a 40 000 ans. In: C. Farizy (ed.): *Paléolithique moyent récent et Paléolithique supérieur ancien en Europe. Ruptures et transitions: examen critique des documents archéologiques*. Mémoires de Musée de Préhistoire d´Ile de France 3, Nemours: Ed. de A.P.R.A.I.F., 115–124.

Valoch, K. 2000: Das Szeletien Mährens – seine Wurzeln und Beziehungen. In: Z. Mester, A. Ringer (eds.): *À la recherche de l'Homme Préhistorique*. ERAUL 95. Liège: Service de Préhistoire, Université de Liège, 287–294.

Vass, D., Elečko, M. 1977: Tvar valúnov a genéza pozdišovskej štrkovej formácie. *Mineralia slovaca* 9(1), 43–65. Available form: https://1url.cz/Uelii.

Verpoorte, A. 2002: Radiocarbon dating the Upper Palaeolithic of Slovakia: results, problems and prospects. *Archäologisches Korrespondentblatt* 32(3), 311–325.

Vizdal, J. 1970: Neskoroeneolitické nálezy z Oborína. *Slovenská archeológia* XVIII(2), 1970, 217–234. Available from: https://cevnad.sav.sk/aktivita_1_1/slovenska_archeologia_1970_2.pdf.

Vizdal, J. 1977: *Tiszapolgárske pohrebisko vo Veľkých Raškovciach*. Košice: Východoslovenské vydavateľstvo.

Voľanská, A. 2016: Leaf Point Finds from Zemplín Hills Area, Eastern Slovakia. *Litikum – Journal of the Lithic Research Roundtable* 4, 9–18. DOI: 10.23898/litikuma0015.

Wilczyński, J. 2010: The Techniques of Obsidian Treatment on the Malice Culture Settlement of Targowisko 11, Leser Poland. *Przegląd Archeologiczny* 58, 23–37.

Williams-Thorpe, O., Warren, S. E., Nandris, J., G., 1984: The distribution and provenance of archaeological obsidian in Central and Eastern Europe. *Journal of Archaeological Sciences* 11(3), 183–212. DOI: 10.1016/0305-4403(84)90001-3.

Zandler, K. 2012: A paleolitikum kőiparai Eger környékén. *Gesta* XI, 3–54.

Zandler, K., Markó, A. Péntek, A. 2021: Szetian or not Szeletian. Bifacial industries from open-air Middle Palaeolithic sites from the Cserhát Mountains (Northern Hungary). In: A. Nemergut (ed.): *Fossile directeur. Multiple perspectives on lithic studies in Central and Eastern Europe*. Študijné zvesti Archeologického ústavu SAV, Supplementum 2, 31–47. DOI: 10.31577/szausav.2021.suppl.2.3. Available also from: https://www.sav.sk/journals/uploads/1220193603_Zandler_Marko.pdf.

Žec, B. (ed.) 1997: *Vysvetlivky ku geologickej mape Vihorlatských a Humenských vrchov. 1: 50 000*. Bratislava: GSSR.

Resumé

V oblasti pahorkatín na západ od Zemplínskych vrchov po rieku Roňavu, ktorá tvorí hranicu s Maďarskom, boli objavené početné lokality s kamennou industriou. Ide o rôzne polohy v katastroch obcí Veľká Tŕňa, Čerhov, Luhyňa a Veľaty (obr. 1–3). Mnohé náleziská sú situované na výhodných polohách, ktoré boli vyhľadávané opakovane. Výsledkom sú polykultúrne lokality so štiepanou kamennou industriou z paleolitu a z post-paleolitických kultúr. Na žiadnej z nich sa nenašli keramické črepy. Nálezy pochádzajú zo zberov M. Iľka a I. Smatanu na lokalitách Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B, Luhyňa I, Luhyňa II a Veľaty III a našich zberov na lokalite Luhyňa II.

Geológia oblasti a zdroje kamenných surovín

Oblasť Zemplínskych vrchov aj západne ležiace Slanské vrchy sú známe výskytom vhodných surovín, ktoré boli hojne využívané v dobách kamenných. Dominantné postavenie majú obsidiány, ktoré sú produktmi treťohorného ryolitového vulkanizmu. Obsidiány sú sústredené v dvoch zdrojoch. Prvý predstavujú Viničky s obsidiánmi menších rozmerov a väčšinou bez skulptúry (Bačo et al. 2017). Druhý zdroj v oblasti Cejkov – Brehov poskytuje obsidiány so skulptúrou (Přichystal, Škrdla 2014). Okrem obsidiánov došlo k vzniku opálov/chalcedónov, limnosilicitov a jaspisov (Ďuďa, Ozdín 2012).

Stredný paleolit

Štiepaná kamenná industria zo stredného paleolitu bola identifikovaná na lokalitách Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A a Čerhov II – Pod Hečkou B. Všetky súbory majú úštepový charakter a obsahujú nástroje typické pre stredopaleolitický neskorý moustérien. Prevažuje lokálna surovina opál/chalcedón, ktorého jeden zo zdrojov sa nachádza severne od Luhyne. Z lokálnej suroviny sú jadrá štiepané diskovitou metódou.

Bifaciálne retušované listovité hroty z lokalít Veľká Tŕňa – Hečka (obr. 4: 1a, b; 8), Čerhov II – Pod Hečkou A (obr. 5: 8a, b) a Čerhov II – Pod Hečkou B (obr. 6: 6a, b), sú tvarované na úštepoch. Môžeme ich zaradiť k takmer listovitým tvarom alebo čiastočne listovitým hrotom (Nerudová et al. 2011). V priečnom aj v pozdĺžnom priereze sú symetrické. Hrot z Čerhova II – Pod Hečkou A je tvarovaný retušou typu „alternate" (podľa Mester 2010; 2014), resp. „wechselseitig-gleichgerichtete Kantenbearbeitung" (podľa Bosinski 1967). Distálne konce sú tupé následkom impaktu alebo zlomenia. Hroty sú z opálu, rádiolaritu a z eratického pazúrika. Driapadlo s plošnou retušou je štiepané na väčšom úštepe z rádiolaritu (obr. 5: 6).

Na lokalitách sa nevyskytli žiadne suroviny maďarského pôvodu, čo oslabuje možnosť súvisu s maďarským szeletienom. Listovité hroty museli byť na lokalitu prinesené už hotové, keďže sa nenašli úštepy dokladajúce ich výrobu alebo opravu. Iba sprievodná industria pozostávajúca z driapadiel z opálu/chalcedónu bola vyrábaná priamo na mieste. Lokality reprezentujú pravdepodobne zvyšky loveckých táborísk využívaných jednorazovo alebo opakovane v krátkych intervaloch skupinami ľudí s tou istou kultúrnou tradíciou.

Mladý paleolit, Aurignacien

Industria s charakteristickými artefaktmi aurignacienskej kultúry pochádza z Luhyne I, Luhyne II a z Veľat III. Ide o prvé známe pamiatky aurignacienu z okolia Zemplínskych vrchov.

Aurignacienské skupiny využívali hlavne lokálne suroviny – opál/chalcedón (Luhyňa I a II), obsidián (Veľaty III), limnosilicit, jaspis. Najpočetnejší súbor predstavuje Luhyňa I (346 artefaktov; tab. 10; 11).

Technologicky je industria charakterizovaná ako čepeľovo-úštepová. Prevažujú jednopodstavové jadrá vrátane dvoch prizmatických jednopodstavových jadier na odbíjanie čepeliek (obr. 13: 5, 9), v menšej miere sa vyskytli dvojpodstavové (obr. 12: 5, 6) a jadrá so zmenenou orientáciou. Z typologického hľadiska môžeme hodnotiť industriu ako stredný aurignacien, ktorého charakteristickými nástrojmi sú kýlovité (obr. 8: 1, 10; 9: 1) a vyčnievajúce škrabadlá (obr. 7: 3; 8: 6, 7, 9; 10: 11) a klinové rydlá (obr. 8: 8; 9: 2, 4–7) vyrobené na silných úštepoch z opálu/chalcedónu. Dopĺňa ich priečne rydlo z obsidiánu. Vyskytujú sa aj čepeľové a úštepové škrabadlá. V Luhyni I prevažujú škrabadlá nad rydlami. V Luhyni II a vo Veľatoch III sú škrabadlá, ale rydlá sme neobjavili.

Čepele tvoria menšiu časť inventárov, početnejšie sú driapadlá. Zriedkavejšie sa vyskytuje vrták, oškrabovač, retušované úštepy. Prítomnosť úštepov, jadier a zvyškov suroviny dokladá štiepanie priamo na lokalitách. Luhyňa I a Veľaty III predstavujú sezónne táboriská s výrobou industrie priamo v ich areáloch.

Luhyňa II je lokalitou v bezprostrednej blízkosti zdroja opálov/chalcedónov. Zloženie industrie poukazuje na testovanie málo kvalitnej suroviny na jej vhodnosť na výrobu artefaktov. Prevažujú jadrá, ich zvyšky, fragmenty so stopami úderov, kusy suroviny. Z kvalitnejších kusov suroviny boli štiepané tri prizmatické jednopodstavové jadrá (obr. 11: 1, 3, 4). Jediným nástrojom je dvojité atypické kýlovité škrabadlo (obr. 11: 2). Zloženie súboru poukazuje na ateliér na opracovanie suroviny priamo pri zdroji.

Organický materiál vhodný na datovanie sa nezachoval. Zloženie inventárov je blízke súborom z Košickej kotliny. Z lokality Seňa I pochádza OSL datovanie s výsledkom 33.5±2.4 ka (Chu et al. 2019, 13), ktoré možno považovať za relevantné pre väčšinu stredoaurignacienskeho osídlenia v Košickej kotline aj pre industrie s diagnostickými aurignacienskymi nástrojmi z Luhyne I a II a z Veľat III z okolia Zemplínskych vrchov.

Mladý paleolit, Epigravettien

Súbory epigravettienskej industrie z lokalít Veľká Tŕňa – Hečka, Čerhov II – Pod Hečkou A, Čerhov II – Pod Hečkou B a Veľaty III sú nevýrazné a nástrojovo skromné. Dominantnou surovinou je lokálny obsidián, ktorý je typickou surovinou epigravettienskych súborov z východného Slovenska (Bánesz et al. 1992, 8; Kaminská 1995b). V menšom množstve sa objavuje lokálny limnosilicit, opál/chalcedón, z regionálnych surovín je to prekremenený pieskovec, menilitový rohovec a rádiolarit. Patinované pazúriky sú pravdepodobne eratický pazúrik z oblasti Sliezska (Přichystal 2009).

V technologickom zložení industrií sú zastúpené jadrá, úštepy, čepele a nástroje. Jednopodstavové jadrá na čepele a čepieľky (obr. 13: 5, 9) sú typické. Čepele sa zachovali zväčša v zlomkovitom stave, výnimkou sú dve čepele z hrany jadra z obsidiánu z Veľat III.

Skupina nástrojov je slabo zastúpená. Vyskytli sa len tri úštepové škrabadlá a dve rydlá, z nich jedno hranové z obsidiánu a jedno atypické z opálu/chalcedónu, šesť retušovaných čepelí a čepieľka s perličkovou retušou obidvoch hrán s odlomeným distálnym koncom z obsidiánu z Čerhova II – Pod Hečkou B (obr. 6: 5).

Surovinové aj technologicko-typologické zloženie zodpovedá epigravettienskym lokalitám v regióne. Nízky počet artefaktov súvisí jednak so spôsobom získania zberom na oráčine, no zrejme aj so sezónnym charakterom krátkodobých táborísk skupiny ľudí, ktorá sa venovala domácim činnostiam a pri odchode si odniesla časť industrie.

Neolit/eneolit až staršia doba bronzová

Industria z neolitu/eneolitu až zo staršej doby bronzovej pochádza z lokalít Veľká Tŕňa-Hečka, Luhyňa I a Veľaty III. Jej presnejšie zaradenie k niektorej z kultúr nie je možné, pretože keramické črepy sa nenašli.

Čepeľová štiepaná kamenná industria je takmer výlučne z obsidiánu. Sporadicky sa vyskytol opál/chalcedón, limnosilicit a pazúrik pravdepodobne krakovsko-jurský z Poľska.

Spolu sa našlo 15 jednopodstavových jadier alebo ich zvyškov z obsidiánu (obr. 13: 1).

Čepele sú zastúpené len tromi kusmi Nástrojovú skupinu tvoria dve retušované čepeľové a jedno úštepové škrabadlo, retušované čepele a úštepy z obsidiánu, ako aj jeden vrub z obsidiánu.

Obsidiánové šípky z Luhyne I (obr. 7: 2) a z Veľat III (obr. 12: 1a, b) s plošnou retušou robenou tlakom môžu súvisieť s koštianskou alebo otomansko-füzesabonyskou kultúrou.

Nedá sa vylúčiť, že artefakty patria viacerým kultúram a vznikli ich neskorším zmiešaním. Miniatúrne jadrá a úštepy s čiastočnou plošnou retušou umožňujú skôr zaradenie do eneolitu než do neolitu.

Contact

Ľubomíra Kaminská
Slovak Academy of Sciences
Institute of Archaeology
Hrnčiarska 13
040 01 Košice
Slovakia
kaminska@saske.sk
ORCID: 0000-0003-4861-2017