Proto-Eneolithic settlement feature for leather processing Analysis of the Epi-Lengyel lithics from Drnholec, South Moravia

Časně eneolitický objekt na zpracování kůží Analýza epilengyelské štípané industrie z Drnholce, okr. Břeclav

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The state of knowledge of the Epi-Lengyel settlement of South Moravia is still limited to a few isolated published sites, with a predominant focus on the typological evaluation of pottery. Collections of lithics remain unevaluated or are treated mainly typologically. The inventory of the settlement feature from Lidická Street, Drnholec, Břeclav district, comprising, among other things, 45 lithic pieces, has made it possible to apply modern methods to the evaluation of the collection, elucidating detailed aspects of its use and the depositional context of this function. It is the first-ever collection of Epi-Lengyel lithics in Central Europe studied by use-wear analysis. The results of this analysis show that it is a functionally homogeneous assemblage that was intended for processing animal materials, mainly leather. In terms of the distribution of raw material, there is an absolute orientation towards local sources. In a broader settlement context, the site appears peripheral.

Epi-Lengyel – Proto-Eneolithic – lithics – use-wear analysis – lithic raw materials

Poznání epilengyelského osídlení na jižní Moravě je dosud omezeno na několika málo izolovaných publikovaných lokalit, s převahou zaměření na typologického vyhodnocení keramiky. Kolekce štípané industrie zůstávají dosud nevyhodnoceny, nebo pojednány převážně typologicky. Inventář sídlištního objektu z Drnholce – Lidické ulice, čítající kromě jiného 45 ks štípané industrie, umožnil aplikovat na studium kolekce moderní metody, které objasňují detailní aspekty jejího používání a depozičních souvislostí těchto funkcí. Jde o vůbec první traseologicky vyhodnocený soubor epilengyelské štípané industrie ve střední Evropě. Z výsledků traseologických analýz vyplývá, že se jedná o funkčně homogenní soubor, který byl určený ke zpracování živočišných materiálů, především kůží. Z hlediska distribuce kamenné suroviny se projevuje absolutní orientace na lokální zdroje. V širším sídelním kontextu se lokalita jeví jako periferní.

Epilengyel – časný eneolit – štípaná industrie – traseologie – kamenné suroviny

Introduction

The current state of knowledge of the Epi-Lengyel period (c. 4300–4000 BC) in the Morava River basin suffers from long-term stagnation. Apart from the systematization of ceramic typology (*Koštuřík 2007*), partial analyses of knapped lithic artefacts, and the publication of individual archaeological discoveries, there has been no qualitative shift in the understanding of the organization of human society since the 1990s (*Podborský ed. 1993*; *Lenneis et al. 1995*). Despite the formal similarity of ceramic production, it can be concluded from the known archaeological sources that the Moravian – Lower Austrian region was socially distinct from Bohemia in this period, which is characterised by numerous

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occurrences of enclosed areals (*Krištuf – Turek a kol. 2019*) and the mechanisms of the distribution of raw lithic materials (*Dobeš et al. 2007*).

If we take into account the basic work related to this period in Moravia in the last 30 years, there is an obvious conceptual duality. *P. Košturík* (*1997*; *2007*; *Kazdová et al. 1994*) used the term 'Jordanów culture'. Later, a group of authors (*Čižmář et al. 2004*), in connection with the proposal of a new chronology for the Lengyel culture, used the term 'Epi-Lengyel' or 'Lengyel IV' to describe the final stage of the Lengyel culture. The terminological discrepancy between the Jordanów culture and Epi-Lengyel was discussed by *J. Pavelčík* (*2001*), but he was not categorically inclined to use either term in his conclusion. In the recent works of *M. Šmíd* (*2017*; *Šmíd et al. 2021*), one can observe the loose treatment of these terms; *P. Kalábková* (*Kalábek – Kalábková 2020*), although co-author of a periodization proposal that used the terms 'Epi-Lengyel' and 'Lengyel IV', writes about the Jordanów culture in a recent paper. In Lower Austria – a territory that is archaeologically inseparable from Moravia – the terminological development is different. While in the synthesis on the Late Stone Age (*Lenneis et al. 1995*), the term *Bisamberg-Oberpullendorf-Gruppe* is used to describe the pottery type, the period in general is called *Epilengyelzeit*. In a recent synthesis of the Lower Austrian Neolithic (*Lenneis 2017*), only the term *Epilengyel* is used.

Furthermore, there is no consensus among scholars on whether to refer to finds from this period as 'culture' (e.g. *Košturík 1997*) or 'stage' (*Čižmář et al. 2004*), reflecting the lack of a formalised definition for these terms and the problematic need for a categorical definition of pottery in terms of delimited typological groups. In view of the fact that the pottery in this study constitutes a marginal group of finds, in what follows we stick to the term 'Epi-Lengyel', which expresses only in general terms the end of the Lengyel period and can be used trans-regionally in the context of the central Danube, regardless of recent historical boundaries. The chronological or typo-chronological terms presented cannot be clearly categorised, just as the Bisamberg-Oberpullendorf ceramic group in Austria cannot be clearly separated from the Jordanów/Epi-Lengyel ceramics in Moravia. Such a division reflects individual, regional, or national terminology, but not prehistoric society. In archaeological communication, chronologically formulating an absolute time interval and indicating the geomorphological area in question are particularly important.

The new find at Drnholec, southern Moravia, despite its limitation to a single settlement feature, is a characteristic manifestation of settlement activity in southern Moravia (meaning south of Brno). The discovery of a relatively numerous assemblage of lithics with a predominantly blade-like character and a considerable degree of standardisation gave us a certain 'workshop' impression–in the sense of a site in which the knapping of debitage from cores took place (*Schild 1980*, 70–72; *Kaňáková 2013*, 174–180). A workshop facility used for the production of debitage is characterised by evidence of the various production phases, particularly preparation, reparation, and waste debitage, accompanied by residues or fragments of cores. It is an organically generated waste deposit, a remnant of the production sequence, usually after the target or otherwise used/usable products have been removed. Finds from this type of feature characterise the early stages of the operational chain of the lithics. The basic condition for the verification of such a production site is that there are no worn lithics in the collection. This should be verified by use-wear analysis. In contrast to features in which lithics were produced, there are features in which larger sets or toolkits of lithics were functionally used to such an extent and in such a way that worn,

dulled, or discarded tools were continually deposited at the place of use or in the immediate vicinity. The toolkit may have included both retouched tools and only worn tools, which are usually not reflected if use-wear analysis is not applied, as well as presumed tools made from organic materials, later degraded by depositional conditions. Collections from such features have not, to our knowledge, been published so far from the studied region.

The identification of similar features defines a unique functional zone of the settlement allocated to a specific economic activity.[1] Such a production feature/zone is characterised by the presence of working and therefore worn tools, in addition to evidence of the material processed at various stages of processing (if preserved). These tools, naturally, stand at the opposite end of the operational chain from the artefacts from the site where the debitage were knapped from the cores. This need not only be so-called target debitage. Repair or decortication debitage with appropriate ergonomic parameters could also be used as ad hoc tools. Only use-wear analysis, and not typology, can reliably decide whether artefacts from such collections were used for an activity. For this reason, use-wear analysis and, more generally, optical microscopy of artefact surfaces have been applied to the entire collection. Other artefacts that were available, e.g. a bone awl and a flat axe blade, were also subjected to basic examination. The analysis of the set of animal bones found in the object also contributed to the reconstruction of the functional context of the lithics.

Finding situation

In 2018, the Regional Museum in Mikulov carried out a rescue excavation on Lidická Street in the South Moravian town of Drnholec, before the construction of a new cultural house. Considering the total number of documented archaeological features, which exceeded 100, this was a rather extensive excavation. The majority of the features were dated by ceramic typology to the Early and Late Bronze Age, to the Middle Ages, and further to the Modern Period (*Červená – Trampota 2019a*; *2019b*). Among the accumulations of features from these periods, one feature with a different material culture was discovered, which, thanks to radiocarbon dating, was chronologically assigned to the Epi-Lengyel with high probability.

The archaeological site is located in the Dyje-Svratka Valley at the north-eastern foot of a prominent hill on Lidická Street, on a terrace above the alluvium of the Thaya River (*fig. 1*). The geological subsoil of the site consists of tertiary marine clays, with local sandy deposits. In contrast to the current regulated flow of the Thaya, one former river arm flowed directly under the hill at a distance of approximately 150 m from the site. Any Epi-Lengyel sites are known in Drnholec cadastre, and the surrounding area. From the chronologically preceding period, only two sites from the Late Lengyel can be mentioned in vicinity: Malé hajdy (*Peška 1993*) and Mrchoviště (*Přichystal – Trampota 2019*).

Feature no. 568 was located in the eastern part of the investigated area (*fig. 2*) in close proximity to a partially investigated Late Bronze Age pottery pit (feature 567) and a conical pit (feature 573) from the Early Bronze Age, in which a human burial torso was found

[1] However, given the documented level of social complexity, these production features cannot be described as workshops in the sense of specialised craft production for wider distribution.

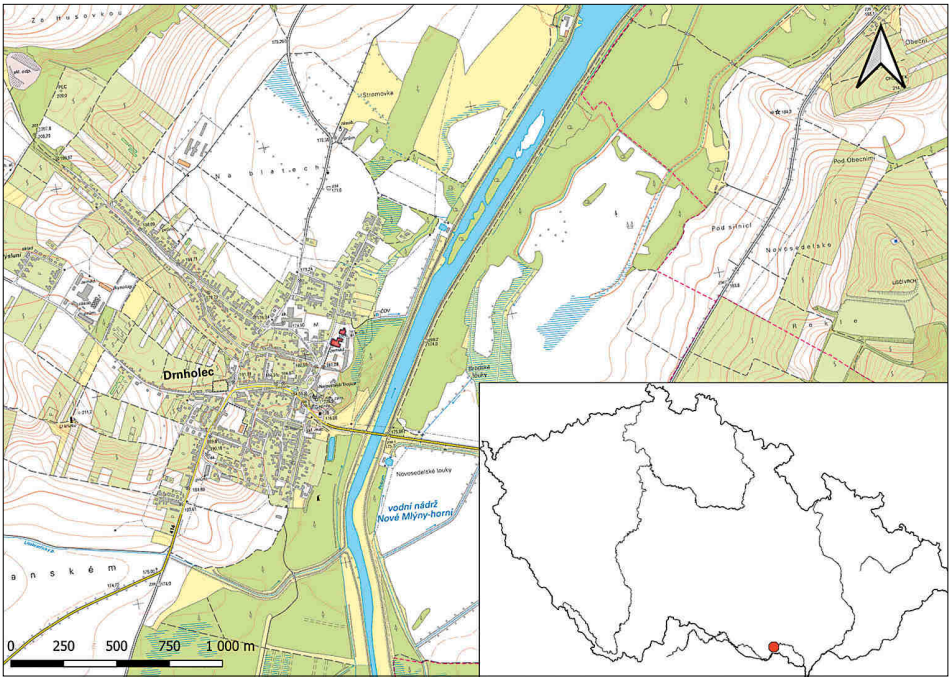

Fig. 1. Location of the archaeological site Drnholec – Lidická Street.
Obr. 1. Poloha archeologické lokality Drnholec – Lidická ul.

(*fig. 3*). Both of these features were disturbed by a set of modern brick pillars (feature 904). Although the geology of the site is predominantly clay, the aforementioned features were dug in sand.

All sunken features were examined manually in mechanical layers of 20 cm. It was not possible to differentiate between feature no. 567 and feature no. 568 after cleaning the surface. This only occurred in connection with the exposure of the 0–20 cm upper layer, when the combination of the different sediment and wall character of feature no. 568 was observed. The shape of the north-eastern part of the feature cannot be reconstructed due to later Bronze Age disturbance. Given the numerous occurrences of lithics, context no. 221 was excavated by successive scraping of the sediment with an archaeological hoe in thin layers. Neither floating nor sieving was carried out under the conditions of the rescue excavation.

Feature description:
568 conical feature with sloping walls and flat bottom. Double local disturbance by later features 567 and 573, the upper part of the fill of the feature (to 220) was also disturbed or overlain by feature 567.

Layer description.
K 220 compact, silty, clayey, grey, black stained layer. Occasional pebbles up to 5 cm in size, slightly indistinct to sharply defined context boundaries. Findings: pottery, animal bones and malacofauna.
K 221 grey-black, loose layer, non-sharp boundaries, particularly at base of feature, numerous lenses of sand up to 2 cm in size. Findings: numerous lithics and animal bones, occasional pottery, polished stone tool, and malacofauna shells.

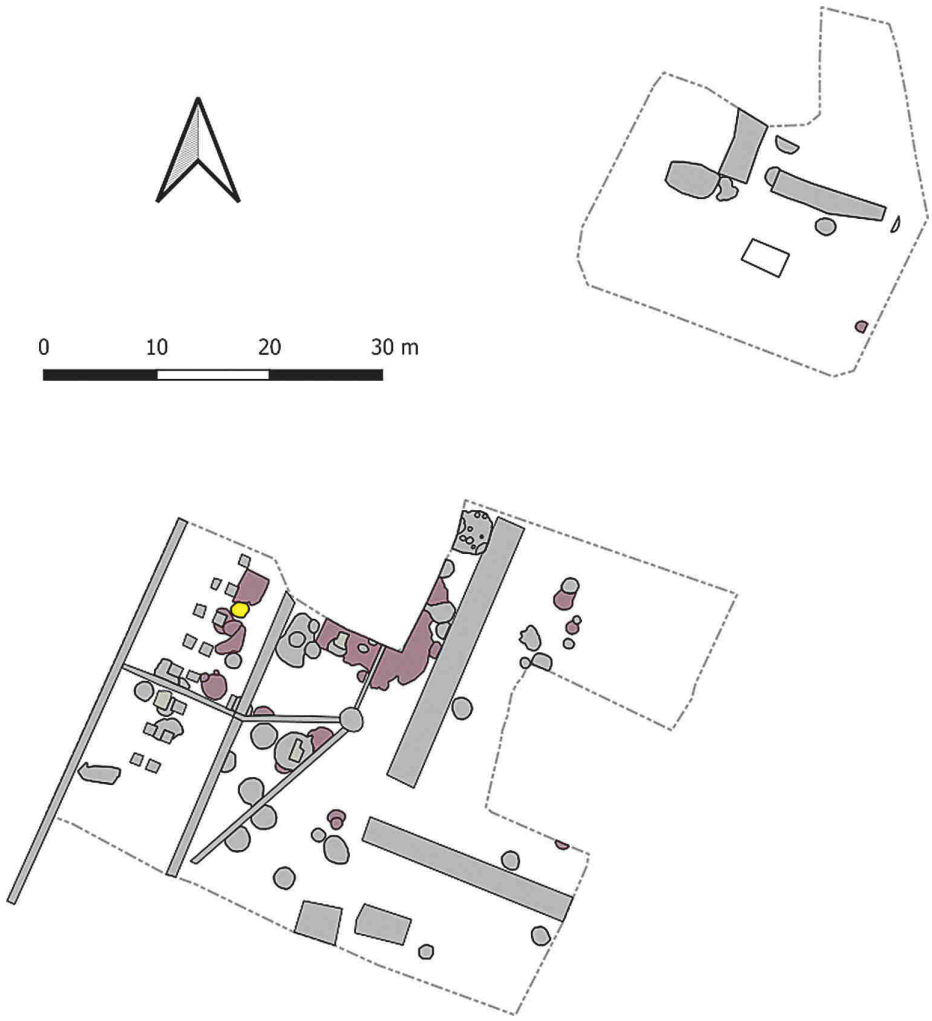

Fig. 2. Drnholec, Lidická Street, excavation plan. Feature 568 is marked in yellow, Bronze Age features in violet, medieval and modern features in grey.
Obr. 2. Drnholec, Lidická ul., plán výzkumu. Objekt 568 je vyznačen žlutou barvou, objekty z doby bronzové fialově, středověké a novověké objekty šedou barvou.

Description of artefacts and other finds (*fig. 4: 1–11*)
Lithics (*figs. 6–7*)
The whole collection comes from the lower layer (k 221) of feature 568 and contains 45 pieces, mostly from local raw materials from the Krumlovský les. Detailed analysis is in the Results chapter.

Ceramics
K 220
1. A large ceramic fragment from the vessel body, grey colour on both sides, surface treatment by smoothing on the outer side, without treatment on the inner side, surface significantly locally eroded, ceramic mass with a significant admixture of a sharp-edged temper up to a maximum size of 8 mm, also a significant presence of fine-grained muscovite observed, m=349 g.

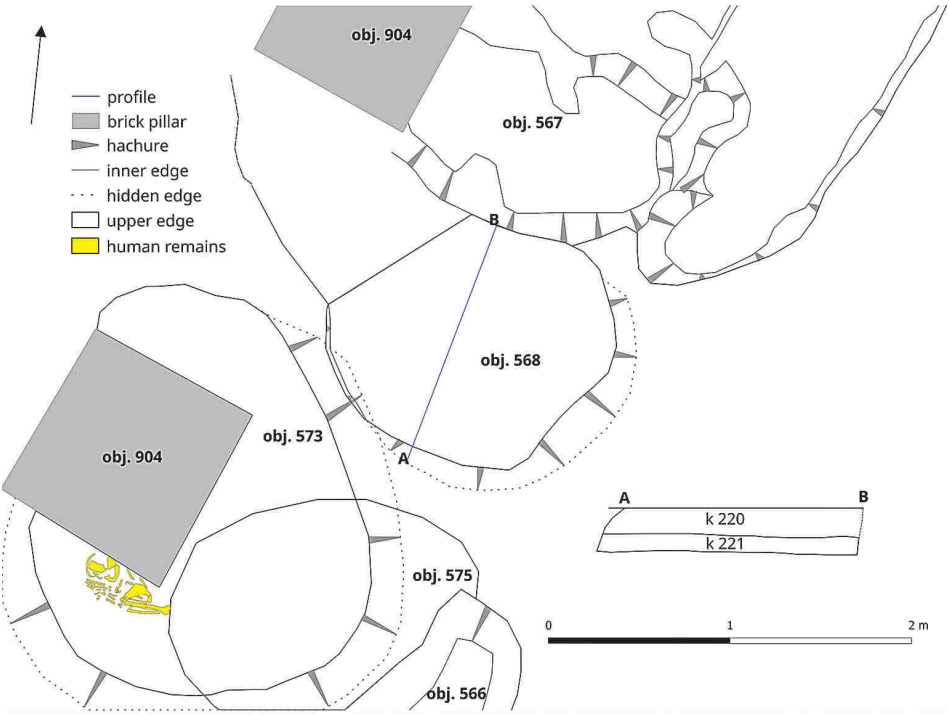

Fig. 3. Drnholec, Lidická Street. Plan of feature 568 and its surroundings.
Obr. 3. Drnholec, Lidická ul. Plán objektu 568 a jeho okolí.

2. Ceramic fragment from the vessel body, the colour of the outer side varies from grey to brownish orange, the inner side is grey, surface treatment by smoothing on the outer side, no treatment on the inner side, ceramic mass with an admixture of a sharp-edged temper up to a maximum size of 2 mm, furthermore, a distinct presence of fine-grained muscovite is observed, m=78 g. One side of the fragment bears traces of secondary grinding.
3. Ceramic fragment of the maximum belly, outer surface grey, smoothed, inner black, without surface treatment, sharp-edged temper up to max. 2 mm, m=15 g.
4. Small ceramic fragment, surface colour black on both sides, outer surface finely smoothed, inner side obliterated, admixture of sharp-edged temper up to max. 3 mm, m=4 g.
5. Small ceramic fragment, grey-black surface colour on both sides, outer side finely smoothed, inner side obliterated, fine-grained ceramic mass, m=5 g.
6. Small ceramic fragment, outer surface grey-black, inner side brown-orange, inner side smoothed, ceramic mass fine-grained, m=2 g.
7. Small fragment of a vessel from the High Middle Ages, intrusion, m=4 g.
K 221
8. small rim fragment, orange surface colour outside and inside, fine floated ceramic material, red dye painting on both sides, m=4 g (*fig. 4: 13*).
9. Small fragment, dark grey surface colour on both sides, outer surface smoothed, m=2 g.
10. Small fragment, black surface colour on both sides, outer surface glazed, m=2 g.

Daub
Two small pieces of daub, weighing a total of 5 g, were found in context 220. Two small pieces of daub weighing a total of 3 g were found in context 221.

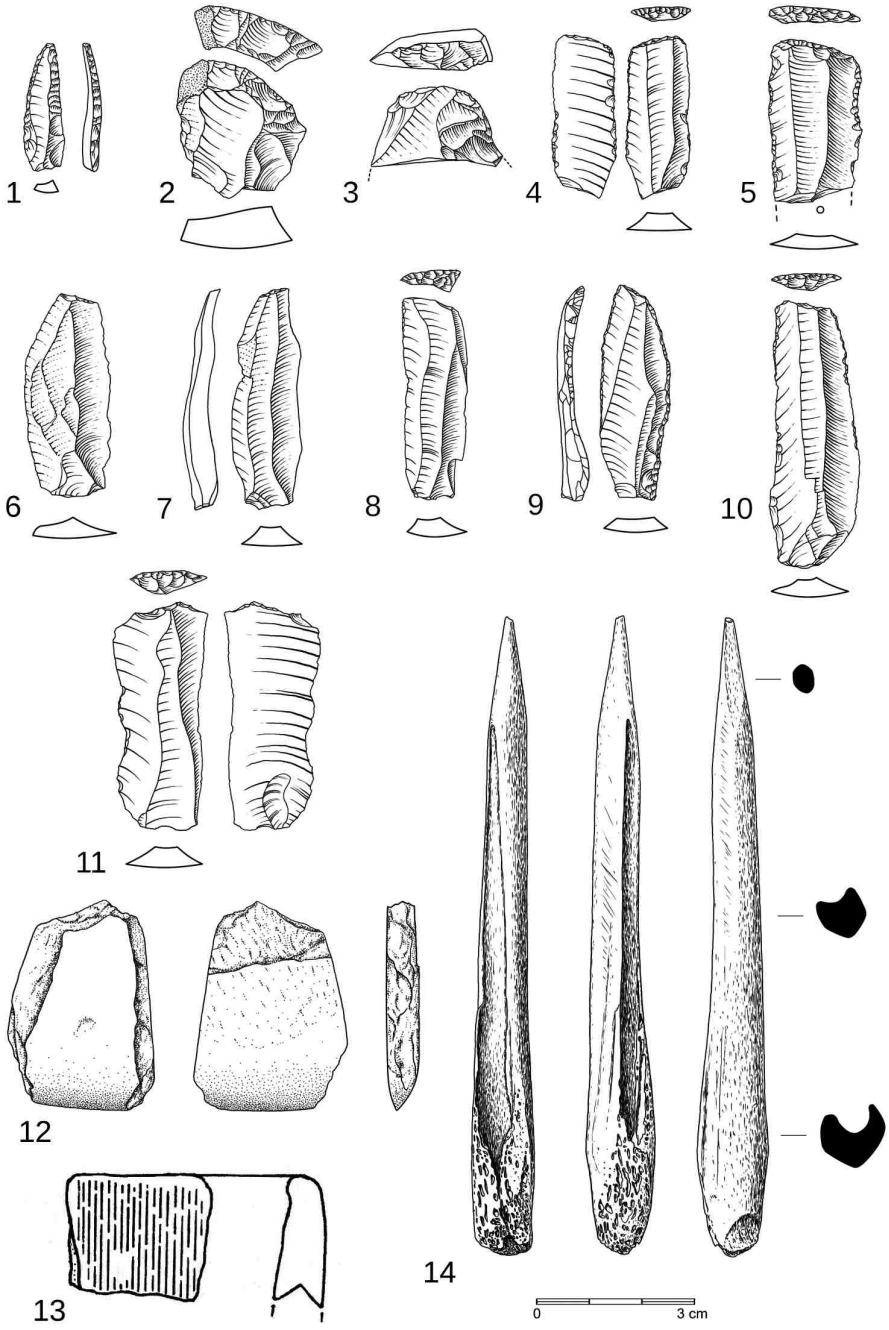

Fig. 4. Drnholec, Lidická Street, feature 568. Drawing documentation of selected lithics, a stone axe, a bone awl, and a painted pottery fragment (vertical hatching shows red colour).
Obr. 4. Drnholec, Lidická ul., obj. 568. Kresebná dokumentace vybraných štípaných kamenných artefaktů, kamenné sekyrky, kostěného šídla a malovaného fragmentu keramiky (svislé šrafování znázorňuje červenou barvu).

Polished stone tool
One small flat axe in the shape of an irregular trapezoid, max. dimensions: height 4.4 cm, width 3.2 cm, length 0.8 cm, raw material: metabasite type Želešice, magnetic susceptibility =1.53 x 10-3 SI (*fig. 4: 12*).

Bone tool
One awl, complete with broken tip, dimensions: length 12.5 cm, max. diameter 1.5 cm (*fig. 4: 14*).

Zooarcheology
Collection of 79 fragments with a total weight of 363 g, without significant damage by taphonomic processes. Context 22: a total of 17 Unio shells and other fragments, total weight 45 g. Context 221 yields a total of 3 Unio shells and other fragments, total weight 15 g.

Ecofact
Flat stone with no signs of use-wear or processing. Material: Miocene coarse-grained calcareous sandstone of local origin.

Methods

A collection of 45 lithics from feature no. 568 was analysed in terms of raw material type, technology, functional wear, and depositional alterations. A reflected-light microscope (Olympus BXM51) was used with 200× magnification. A bone awl and an axe were also evaluated by the method. The artefacts were cleaned only immediately before microscopy, with 96% ethanol. The raw material of the lithics was determined with a water-immersion method using distilled water and an optical microscope with side illumination and magnification of 200×. High-resolution 3D visualization methods based on image correlation (Agisoft Metashape) and RTI (RTI Builder) data were used to document the features of direct percussion by a soft hammer. The recorded data were also visualised in CloudCompare (elevation map).

Zooarchaeological material was identified macroscopically, with the aim of species and anatomical determination. Where possible, the approximate age of individuals was determined; sex could only be determined sporadically. The potential occurrence of taphonomic changes and the presence of macroscopically identifiable cutting or chipping marks were monitored. One of the bones was used to obtain a collagen sample for radiocarbon dating.

Results

1. Basic analysis of the lithics

In terms of the selection of raw materials, the assemblage is characterised by a significant dominance of Krumlovský les-type chert, variety II (hereafter KL II), which is in line with existing information on the use of mostly local raw materials of the Epi-Lengyel lithics in South Moravia. KL II-type chert makes up 84.4 % of the collection, supplemented by only 11.1 % of KL I-type chert and 4.5 % of Moravian Jurassic chert, found in only two pieces. A preference of homogeneous fine-grained masses with good knapping quality is evident. As far as can be judged (if the proximal part of the debitage is preserved), the use of direct strikes with a soft hammer was predominant. Most of the preserved butts have

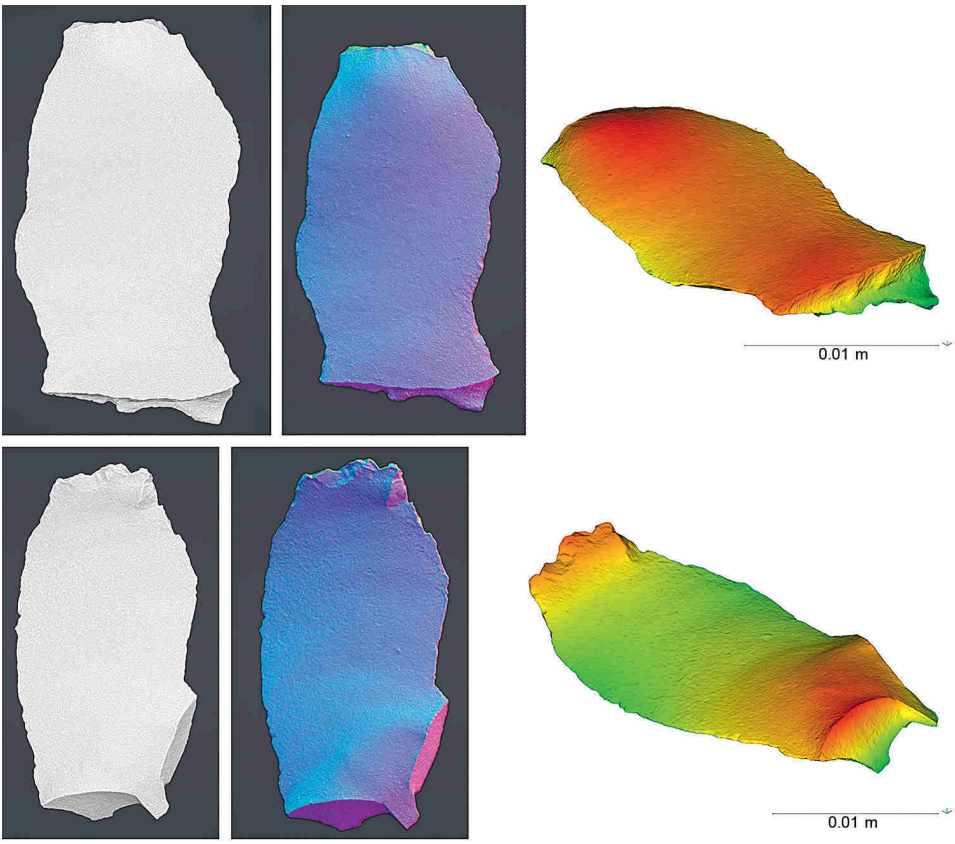

Fig. 5. 3D visualisation of the lip on the butt ventral edge, caused by soft hammer percussion.
Obr. 5. 3D vizualizace římsy na ventrální hraně patky, způsobené úderem měkkým otloukačem.

a distinct lip at their ventral edge (*fig. 5*), while bulb scars and distinctly developed bulbs are rare. Dorsal abrasion of the butt was not found in any case. Identification was possible in 69 % of the artefacts. In the remainder, either the proximal portion was not preserved or the features were not distinct. In total, 51.1 % of the assemblage showed signs of direct impact with a soft hammer, while signs of direct impact with a hard hammer could be identified in 17.8 % of the artefacts.

The raw material preference and the predominant method of knapping technique are consistent with the strong focus on parallel single-platform exploitation (66.7 %) with a significant proportion of blade debitage (24.4 %). The majority of preserved butts (preserved in three-quarters of the samples) are plain (44.4 %). This type of butt (and therefore this level of core platform preparation) is not reserved for any particular exploitation method, debitage type, or striking technique in the collection. Preparation phase products (three pieces), reparations (five pieces), and target debitage (12 pieces) from both parallel and irregular exploitation show the plain butt. In the case of the dihedral (11.1 %) and facetted (13.3 %) butt, the dominance of parallel exploitation, target blade debitage, soft hammer features, and the use of Krumlovský les II-type chert is clear. On the other hand, cortical

Dynamic analysis	unworn	worn	locally retouched	retouched	total
raw material fragment	1	0	0	0	**1**
cortical flake	1	0	0	0	**1**
semicortical flake	1	0	0	1	**2**
repair debitage	5	3	0	0	**8**
small production waste	4	0	1	0	**5**
non-cortical flake	1	4	2	4	**11**
janus flake	0	1	0	0	**1**
flake with parallel negatives	1	3	0	1	**5**
blade	0	2	0	9	**11**
total	**14**	**13**	**3**	**15**	**45**

Tab. 1. Overview of the stages of the operational chain and their involvement in use.
Tab. 1. Přehled fází výrobního řetězce a jejich zapojení do používání.

(6.7 %) butts are accompanied by signs of a hard hammer, and the products are flakes with an irregular pattern of dorsal negatives.

In terms of dynamic analysis, the spectrum of exploitation stages of this assemblage is very specific. Cores and crested blades, typical indicators of the initiation of parallel exploitation, are absent, and decortication products are scarce (two pieces). The remains of the first phase of core preparation are not deposited in the feature. On the other hand, reparations (eight pieces) and tiny debris (both splinters and scales) are relatively abundant in the collection. Groups of debitage from the same core can also be identified based on the characteristics of the raw material and their coloration, although they do not form a conjoining sequence (*figs. 6* and *7*). Thus, the actual exploitation of the prepared cores most likely took place within the feature or in its vicinity. Some of the exploited products were taken elsewhere and some were retouched and used in the area. We see a balanced proportion of unused debitage, ad hoc tools, and retouched tools in the spectrum of the dynamic analysis (*tab. 1*). Unused artefacts are particularly prevalent in the early stages of exploitation, while all categories of target debitage show functional use-wear, and have therefore been used, either in their original state or after the application of some form of retouching (*fig. 8*). From a typological point of view, the tools are mainly represented by endscrapers (11 pieces), with fewer knives (four pieces). The other typological groups were represented by only one specimen: a driller, a transverse arrowhead, a sickle insert, and a saw.

2. Use-wear analysis and surface alteration microscopy of lithics

For the reasons described above, the use-wear method was applied to the entire lithic collection to identify possible production place vs. use place (*tab. 2*). Use-wear traces were identified on 64.4 % of the artefacts (29 pieces), which in itself indicates the distinctly working nature not only of the collection but of the settlement feature as a whole. Of the 11 typologically defined endscrapers, all were worn in the usual locations, and eight of them showed multiple transverse working contact with the leather (*fig. 9*), i.e., the function of animal skin scraping. At least three of these endscrapers were fixed into the handle, which increases ergonomic gain and facilitates work by the lever principle. The fixation into the

Fig. 6. The assemblage of lithics from feature 568, including microphotograph numbers.
Obr. 6. Soubor štípané industrie z objektu 568, vč. čísel mikrofotografií.

handle is evidenced by small sharply demarcated and bright wear spots (*fig. 10*) caused by the hard material of the handle. One of the endscrapers (DRN_568_11) has another worn edge on the ventral side, in addition to the clearly used endscraper edge. This was used for transverse scraping of harder organic material, probably fresh bone. The use-wear produced only a thin band of brighter lustre bound to the working edge (*fig. 11*). These

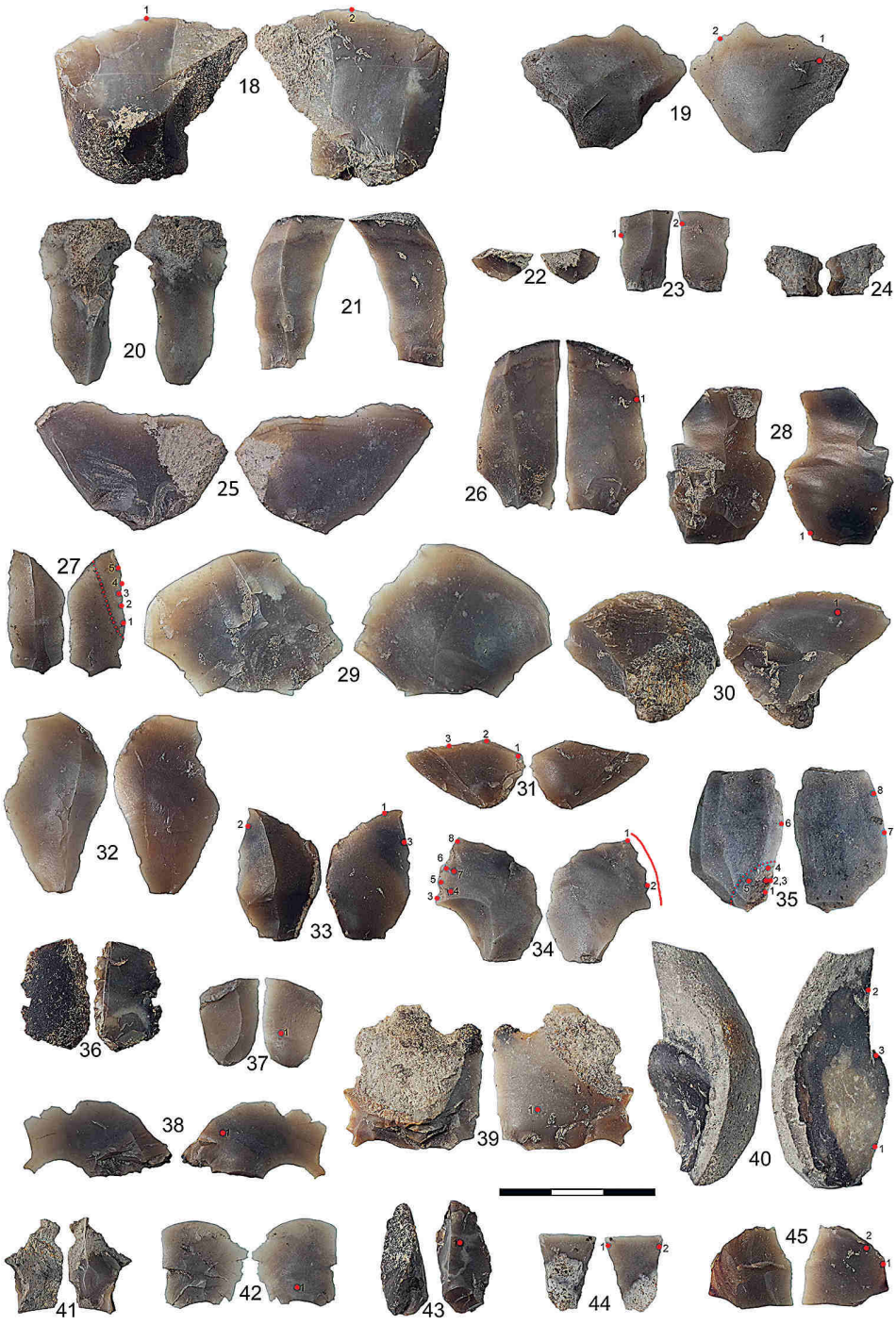

Fig. 7. The assemblage of lithics from feature 568, including microphotograph numbers.
Obr. 7. Soubor štípané industrie z objektu 568, vč. čísel mikrofotografií.

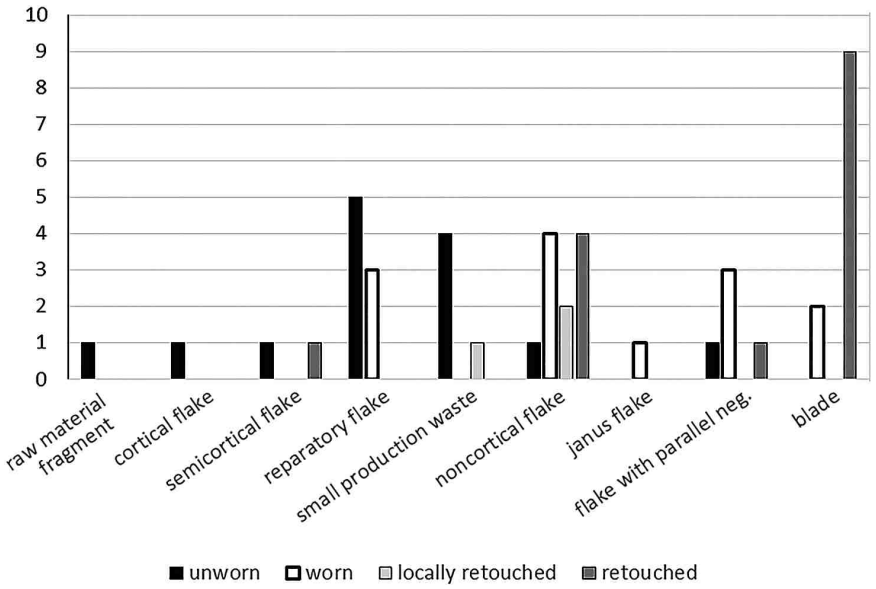

Fig. 8. Dynamic analysis of the application of each exploitation phase in use.
Obr. 8. Dynamická analýza uplatnění jednotlivých exploatačních fází v užívání.

functional edges were used simultaneously, so it is a combined tool, not a tool re-modified from one original function to another subsequent one.

Three of the four knives were used to cut soft animal material, which could be either meat, or fresh or soaked hides (*fig. 12*). However, due to the softness of the material being processed, no striations could be reliably identified, and the longitudinal trajectory of the working motion was inferred due to the bifacial distribution of the wear on the working edge and its ergonomics. The last knife (DRN_568_18) was used to cut harder animal material (bone), which left a clearly brighter and narrow polish forming band along the working edge (*fig. 13*). The typologically identified saw (DRN_568_34) was also used to cut soft animal material (dry skin). The working edge is distinctly rounded by wear, with virtually no gloss (*fig. 14*). Similarly, the use-wear of lithic saws to cut dry hides in the Early Bronze Age has been shown (*Kaňáková 2013*, 193–194). The sickle (DRN_568_27) was inserted into the handle and the sickle gloss is diagonal, as is also common in Neolithic sickle insertions. The irregularly serrated blade has been cyclically refreshed: some of the negatives of the sharpening retouch already show new polishes and rounding on the ridges, whereas others are quite fresh (*fig. 15*). The typologically identified driller (DRN_568_10) was used to drill hard organic material, more likely bone, evidenced by the thin bright band of wear (*fig. 16*). No comparative experiments have yet been carried out on local raw materials to make similar identifications. No use-wear was identified on the small trapezoidal arrowhead (DRN_568_44), which is typical for projectile points. Projectiles usually only develop transport wear if the wearer was characterised by increased mobility, or wear caused by binding if the projectiles were not glued into the shaft (*Kaňáková 2020a*). Neither is associated with the hunting use of arrows, which is the dominant use supposed for the studied period.

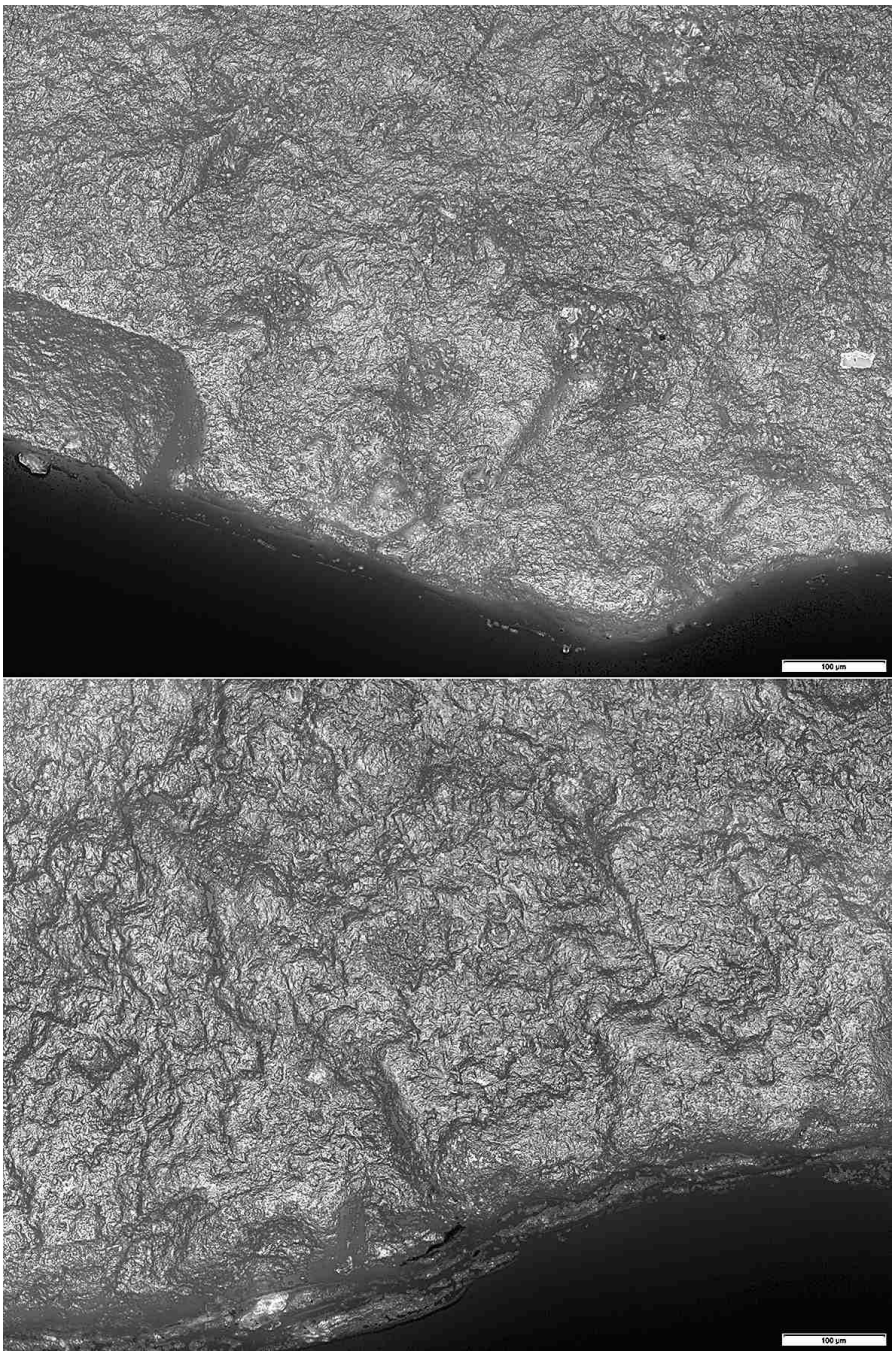

Fig. 9. Wear traces on the working edges of the endscrapers – rounding with a weak diffuse gloss, transverse direction. A. DRN_568_2, B. DRN_568_8. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 9. Traseologické stopy na pracovních hranách škrabadel – zaoblení se slabým difuzním leskem, transverzální směr. A. DRN_568_2, B. DRN_568_8. Zvětšeno 200×. Rozsah měřítka je 0,1 mm.

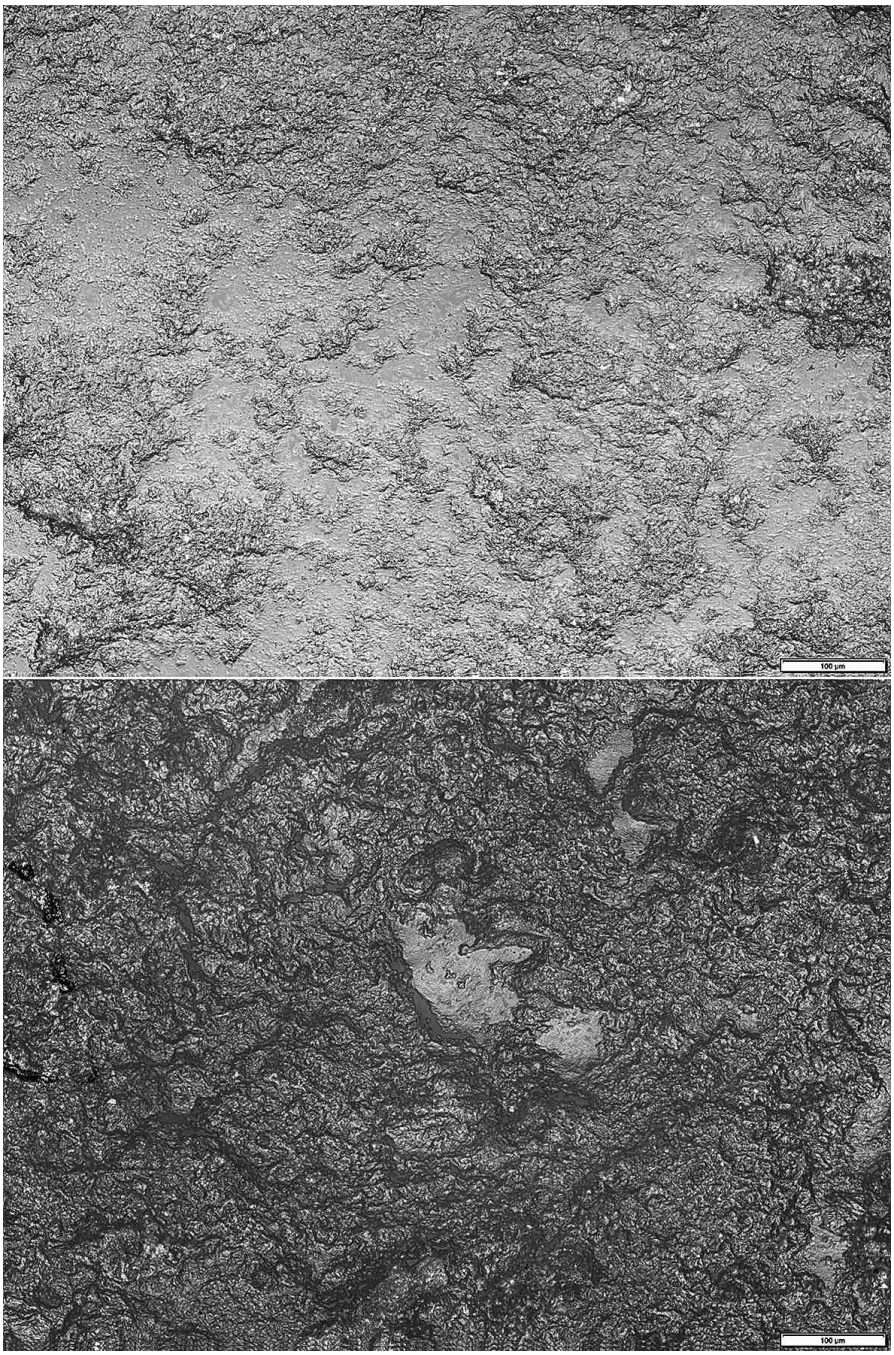

Fig. 10. Wear traces demonstrating the insertion of endscrapers into the handle – clearly defined bright spots. A. DRN_568_3, B. DRN_568_8. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 10. Traseologické stopy dokládající vsazování škrabadel do násady – zřetelně ohraničené plošky s jasným leskem. A. DRN_568_3, B. DRN_568_8. Zvětšeno 200×. Rozsah měřítka je 0,1 mm.

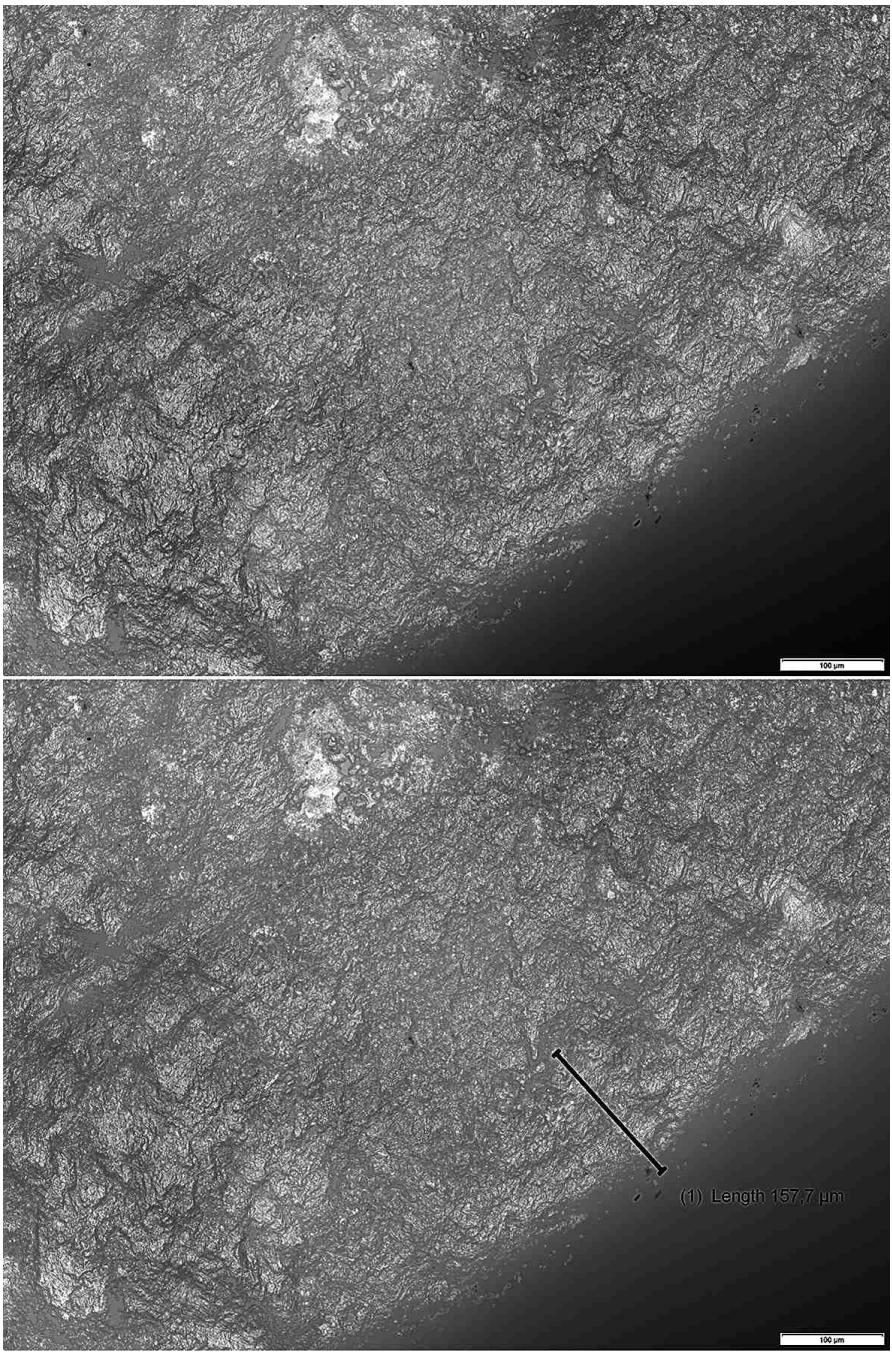

Fig. 11. Evidence of the use of the second working edge of the endscraper DRN_568_11 to scrape bone – narrow brighter rounded edge, location 3. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 11. Doklad použití druhé pracovní hrany škrabadla DRN_568_11 na oškrabování kosti – úzké jasnější zaoblení hrany, bod 3. Zvětšeno 200×. Rozsah měřítka je 0,1 mm.

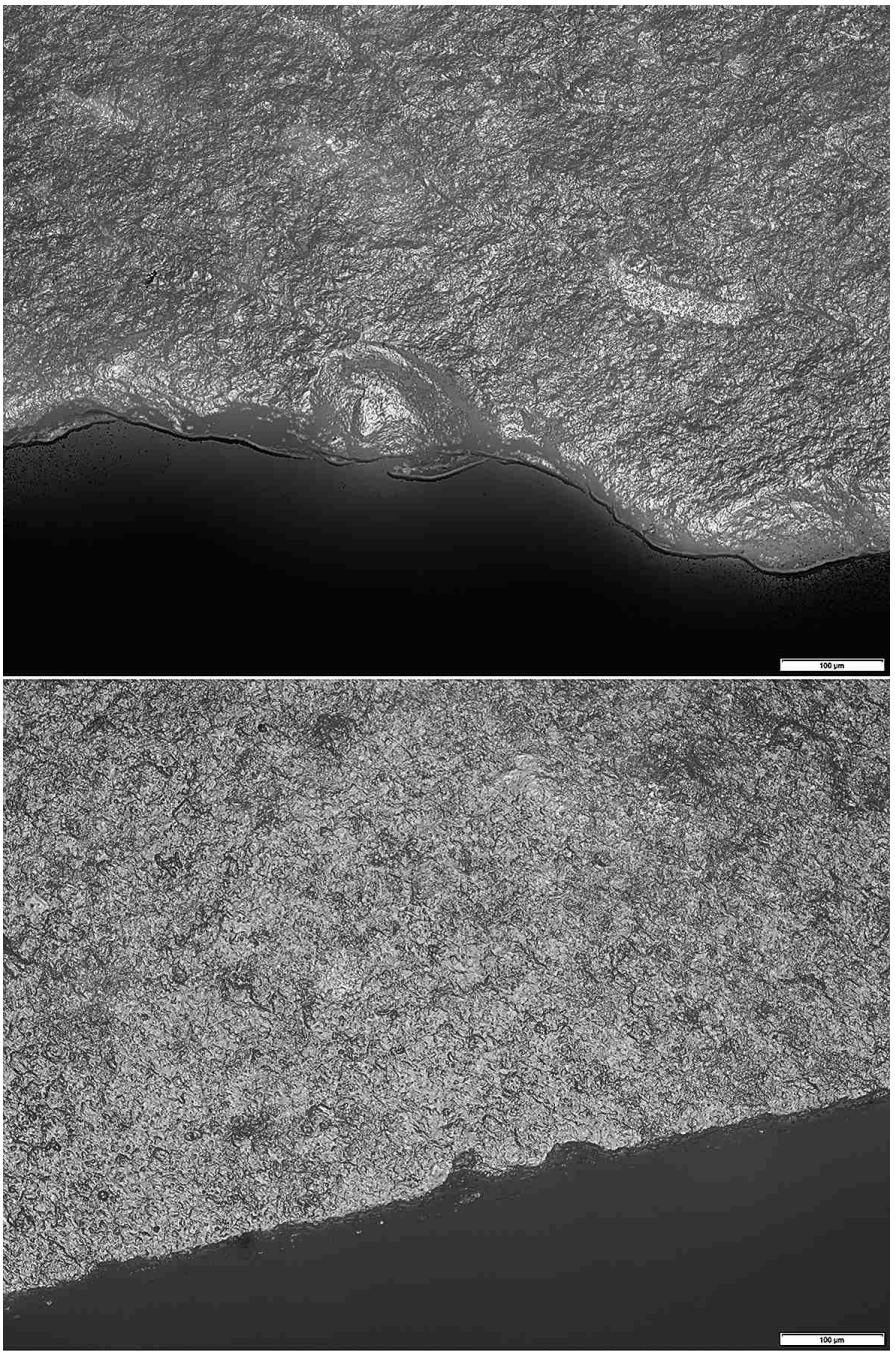

Fig. 12. Wear traces of skin cutting on the working edges of the knives – rounding with a weak diffuse gloss. A. DRN_568_14, B. DRN_568_33. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 12. Traseologické stopy řezání kůží na pracovních hranách nožů – zaoblení se slabým difuzním leskem. A. DRN_568_14, B. DRN_568_33. Zvětšeno 200×. Rozsah měřítka je 0,1 mm.

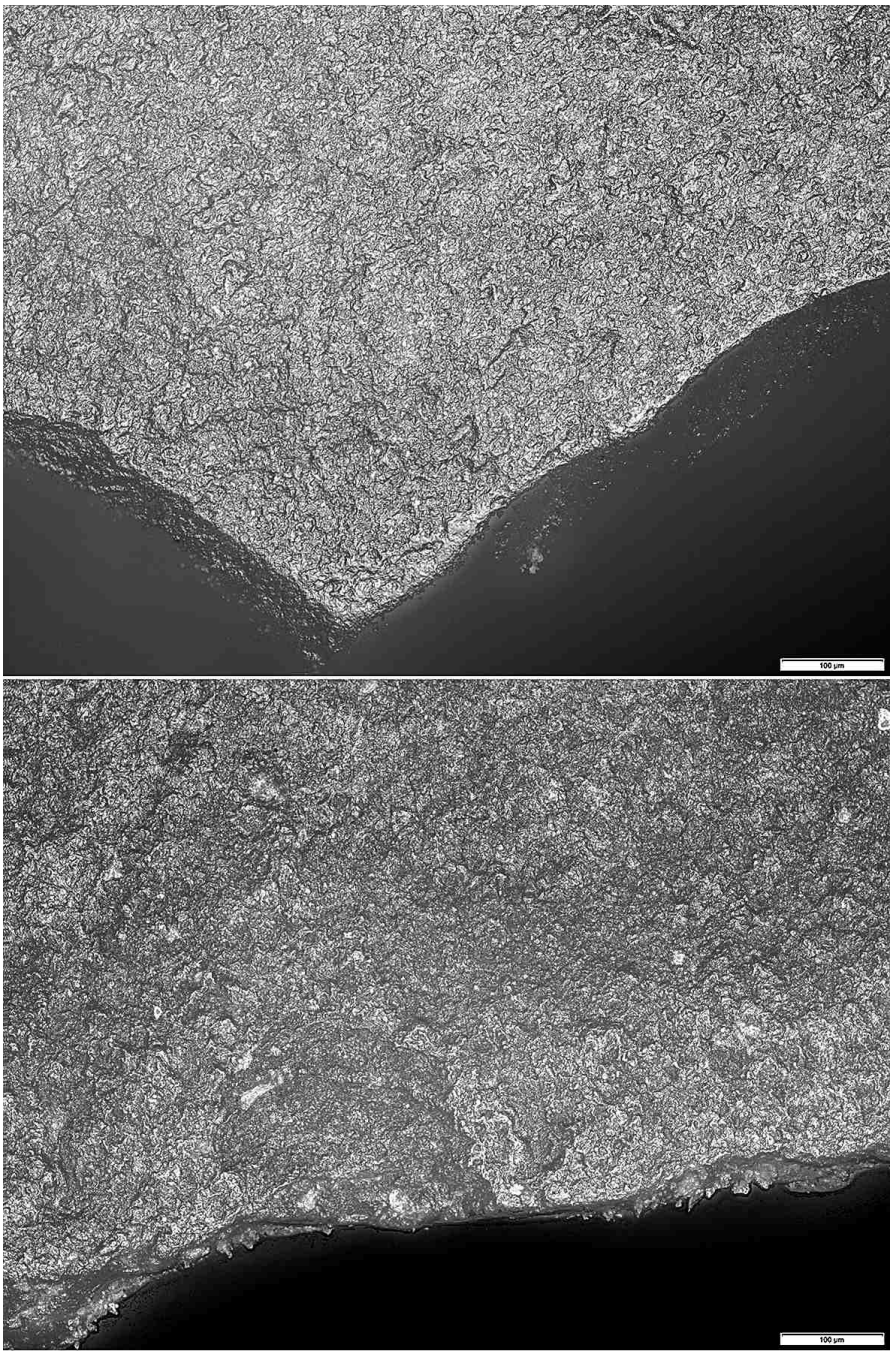

Fig. 13. Wear traces of bone cutting on the working edge of knife DRN_568_18 – narrow brighter edge rounding. A. location 1, B. location 2. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 13. Traseologické stopy řezání kosti na pracovní hraně nože DRN_568_18 – úzké jasnější zaoblení hrany. A. bod 1, B. bod 2. Zvětšeno 200×. Rozsah měřítka je 0,1 mm.

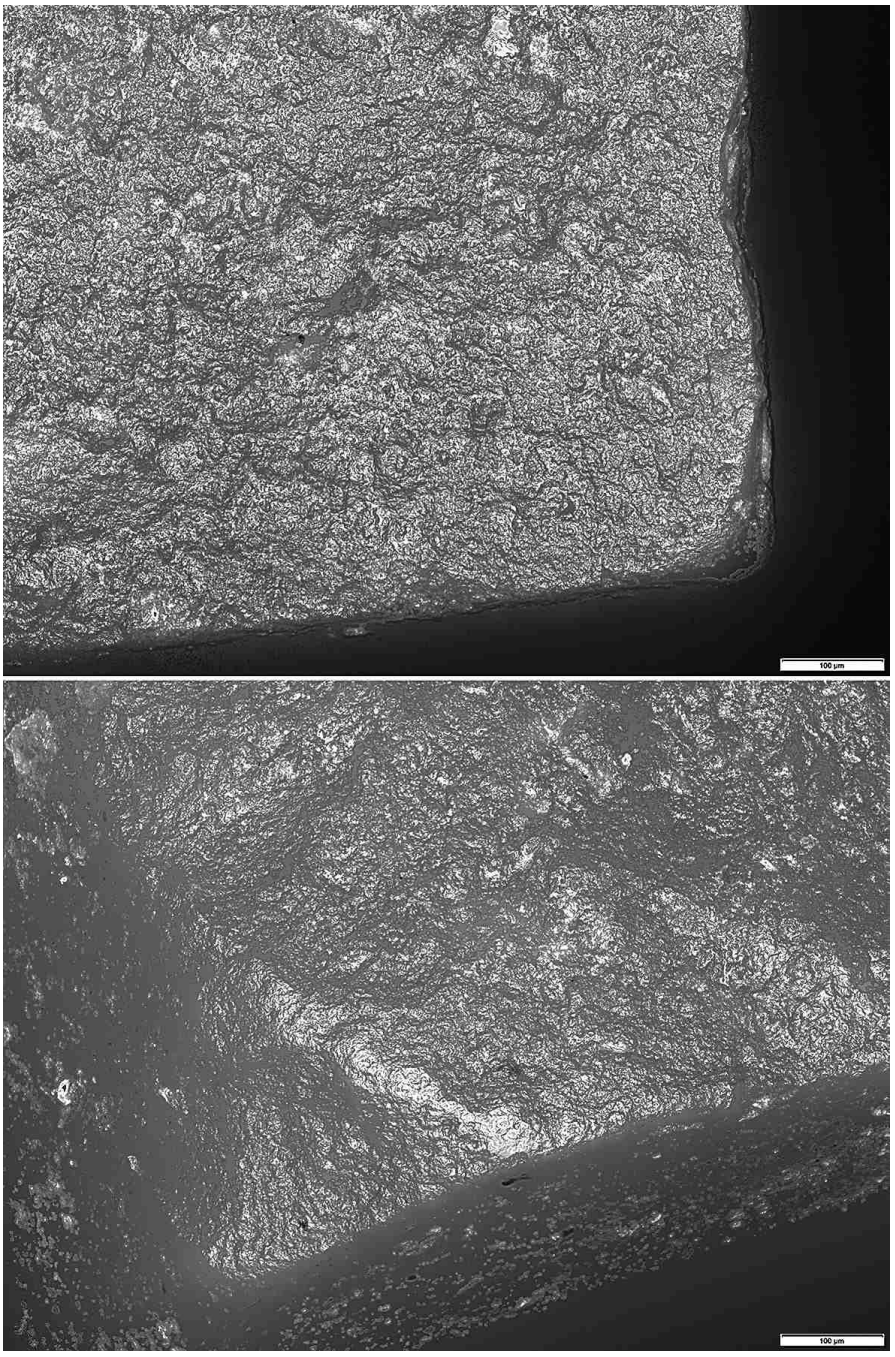

Fig. 14. Wear traces of hide cutting on the working edge of the saw DRN_568_34 – rounding with a weak diffuse gloss. A. location 1, B. location 8. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 14. Traseologické stopy řezání kůží na pracovní hraně pilky DRN_568_34 – zaoblení se slabým difuzním leskem. A. bod 1, B. bod 8. Zvětšeno 200×. Rozsah měřítka je 0,1 mm.

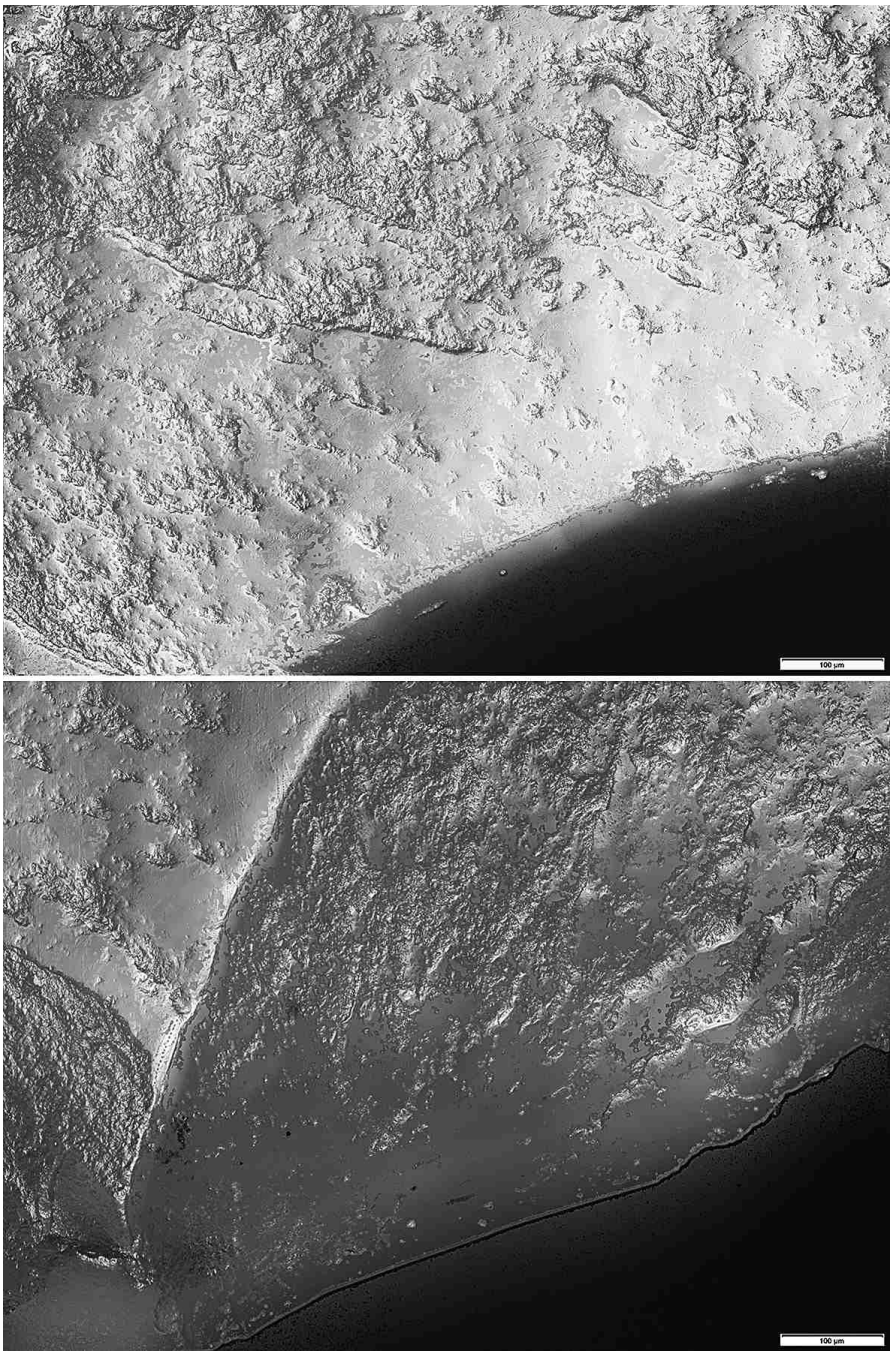

Fig. 15. Wear traces of cereal harvesting on the working edge of sickle DRN_568_27. A. location 3 – sickle gloss with diagonal orientation, B. location 5 – contrast of sickle gloss and negative of sharpening, on the right new use-wear development is visible. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 15. Traseologické stopy řezání obilných stvolů na pracovní hraně srpu DRN_568_27. A. bod 3 – srpový lesk s diagonálním směrováním, B. bod 5 – kontrast srpového lesku a negativu přiostření, vpravo patrný nový vývoj opotřebení. Zvětšeno 200×. Rozsah měřítka je 0,1 mm.

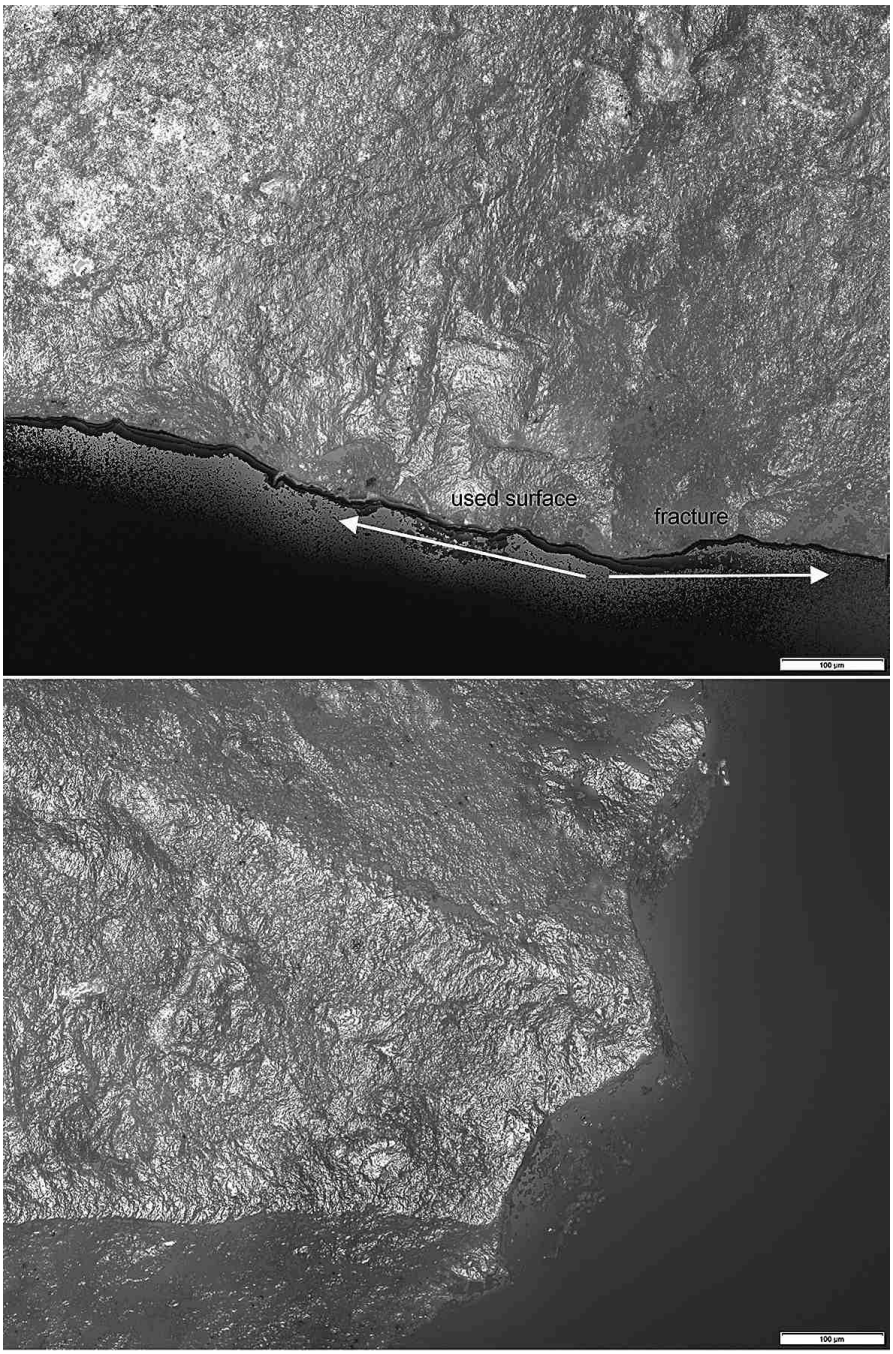

Fig. 16. Wear traces of bone drilling on the working edge of driller DRN_568_10 with a broken tip. The rotational trajectory is evidenced by the alternating wear of the lateral edges. A. location 2, B. location 3. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 16. Traseologické stopy vrtání kosti na pracovní hraně vrtáku DRN_568_10 s ulomenou špičkou. Rotační trajektorii dokládá střídavé opotřebení laterálních hran. A. bod 2, B. bod 3. Zvětšeno 200×. Rozsah měřítka je 0,1 mm.

Fig. 17. Depositional patina caused by deposition in moist degrading animal material. A. DRN_568_2, B. DRN_568_5, C. DRN_568_12, D. DRN_568_16, E. DRN_568_17, F. DRN_568_19, G. DRN_568_23, H. DRN_568_37. Magnified 200×. The range of the scale is 0.1 mm.
Obr. 17. Depoziční patinace způsobená depozicí ve vlhkém degradujícím živočišném materiálu. A. DRN_568_2, B. DRN_568_5, C. DRN_568_12, D. DRN_568_16, E. DRN_568_17, F. DRN_568_19, G. DRN_568_23, H. DRN_568_37. Zvětšeno 200x. Rozsah měřítka je 0,1 mm.

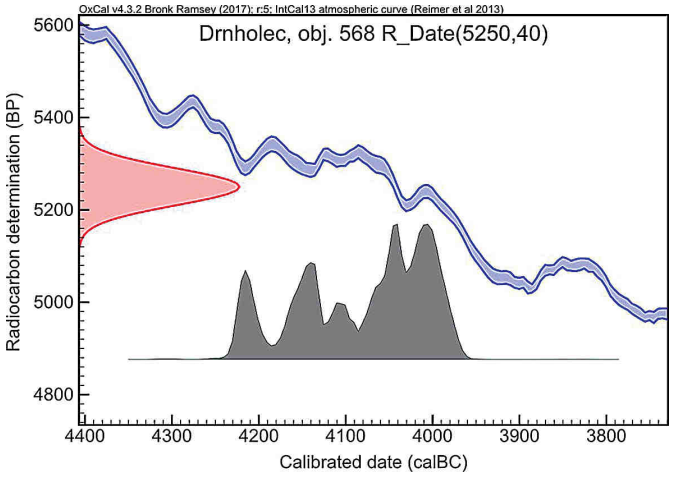

Fig. 18. Radiocarbon date from Drnholec – Lidická Street, feature 568.
Obr. 18. Radiokarbonové datum z Drnholce – Lidické ul., objekt 568.

Use-wear was identified by microscopy on nearly all artefacts that were macroscopically determined into the categories of worn and locally retouched, except for one locally retouched fragment (not counting the aforementioned knives). For most of these ad hoc tools, however, functional use did not last long enough to more accurately characterise the material being processed or the way it was used (use-movement trajectory). Use in soft animal material processing was identified twice, superimposed use first on soft, then hard material once, and hard material twice (chipping).

Also, clear signs of a faint white patina (*fig. 17*), which is characteristic of the deposition of lithic material in organic, rapidly degrading material under the co-action of the moisture present (*Burroni et al. 2002*), were identified during the microscopy. The formation of the patina during a two-year deposition of flakes from local raw materials in the tissues of buried carcasses has been recently confirmed experimentally (*Kaňáková 2020b*, 98–100). Such microscopically visible patina is documented in 82.2 % of the assemblage. It can therefore be concluded that the assemblage of lithics was deposited in feature no. 568, together with a larger quantity of rapidly degrading and wet animal material.

3. Other analyses

Of the total number of 79 fragments, about 25 % of the findings were identified by species and anatomy. The assemblage is dominated by the remains of domestic animals, with the exception of the lumbar vertebra of a hare and the humerus of a hamster, for which, however, recent age could not be ruled out. Of the domesticated animals, small ruminants (sheep and goats) are the most represented, followed by *Bos taurus* and *Sus domesticus*. The presence of a horse was confirmed by the isolated finding of a tibia (*tab. 3*). The condition of the bones shows a predominance of subadult or adult individuals. No macroscopic signs of chopping or cutting were noted on the bones. In one case, there was evidence of healing at the area of a probable fracture in a rib fragment of a medium-sized animal (probably a pig). The periphery of the limbs dominates the assemblage.

For the purpose of radiocarbon dating, a large mammal bone fragment was selected in the assemblage. The resulting calibrated value (*fig. 18*; *tab. 4*) corresponds to an Epi-Len-

Feature	Context	Taxon	Fragment	Number
568	220	*Bos primigenius* f.*taurus*	mandibula	1
			tibia	1
			dens	1
		VV		2
		SV		4
		MV		1
	221	*Sus scrofa* f.*domestica*	dens	1
			os metatarsale III	1
		Ovis ammon f. *aries*	phalanx prim.	4
		Capra hircus f. *aegagrus*	phalanx prim.	1
		Ovis-Capra	tibia	1
			phalanx med.	2
			phalanx dist.	1
		Bos primigenius f.*taurus*	os hyoidum	1
			V-lumb	1
		Cricetus cricetus	humerus	1
		Equus caballus	talus	1
		Lepus europeaus	V-lumb	1
		MV		5
		MV-SV		1
		SV		42
		VV		5
determined in total				19
undetermined total				60
total				**79**

Tab. 3. Summary of the results of the osteological analysis. Abbreviations: VV – large size fauna, SV – medium size fauna, MV – small size fauna.
Tab. 3. Přehled výsledků osteologické analýzy. Zkratky: VV – fauna velké velikosti, SV – fauna střední velikosti, MV – fauna malé velikosti.

Sample number	^{14}C age (BP)	1σ	Material	Collagen	N	C
Poz-115382	5250	40	animal bone	6.2%	2.1%	8.3%

Tab. 4. Drnholec, Lidická Street. Radiocarbon date.
Tab. 4. Drnholec, Lidická ul. Radiokarbonové datum.

gyel period. We used OxCal (*Bronk Ramsey 2009*) for modelling with the IntCal 2020 calibration curve (*Reimer et al. 2020*). Interpretation of radiocarbon dates in this period is complicated by the extensive plateau on the calibration curve, which does not allow for the analysis of shorter time sequences.

We can conclude that the value from Drnholec corresponds to other Epi-Lengyel radiocarbon dates from the settlements in Slatinky and Mostkovice in Central Moravia (*Šmíd 2017*, 16) and from a grave in Pitten (*Stadler – Ruttkay 2007*, 122) in Lower Austria. A comparison of these four radiocarbon dates (*fig. 19*) indicates that the dates from Drnholec and Pitten are with some probability later than the two dates from Central Moravia.

ID on *fig. 21*	Site	Number (pcs)	Krumlovský les type chert – total	Krumlovský les type chert I	Krumlovský les type chert II	Olomučany type chert	Stránská skála type chert	Spongolite	Quartz	Moravian Jurassic chert	Obsidian	Erratic silicite	Silicites of the Kraków-Częstochowa Jurassic	Chocholate silicite	Others	Source
1	Drnholec – Lidická ul.	45	95.4	17.7	77.7					4.4					0	here
2	Drnovice u Vyškova – Kopaniny u lomu	195	5			1		1	2.5	5	3	70	0.5	1	11	*Koštuřík et al. 1998*
3	Kralice na Hané – Kralický háj	14										71.4	14.3		14.3	*Jelínek 2019*
4	Mostkovice – Pod vinohrady	10										90			10	*Jelínek 2019*
5	Rousínov u Vyškova – Přední lány	23	8.7		8.7		60								31.3	*Kaňáková 2018*
6	(Olomouc-) Slavonín-Arbesova ul.	54					3.7	1.9				57.4	33.3		3.7	*Jelínek 2019*
	Popůvky u Brna – Panské nivy						+									*Bálek – Koštuřík 1998*
	Čechovice-Pololání	5										+				*Jelínek 2019*
	Čechůvky-Kopaniny	1										+				*Jelínek 2019*
	Dolní Věstonice – štěrkovna	4	+	+	+											*Koštuřík – Šebela 1994*
	Držovice na Moravě – Díly odvrahovičí	5										+	+			*Jelínek 2019*
	Krasice – U hřbitova	7										+				*Jelínek 2019*
	Lešany u Prostějova – U doubku	5										+				*Fojtík 2000*
	Radslavice u Vyškova – Pod dědinou	1										+				*Koštuřík et al. 1998*
	Slatinky-Močilky	4										+	+			*Jelínek 2019*
	Velká Bystřice – Přední trávníky	6										+				*Jelínek 2019*

Tab. 5. List of sites with a known raw-material spectrum of lithics in Moravia, expressed quantitatively or in the form of evidence of the presence of a given raw material (+).
Tab. 5. Seznam lokalit se známým spektrem surovin štípané industrie na Moravě vyjádřených kvantitativně nebo formou evidence přítomnosti dané suroviny (+).

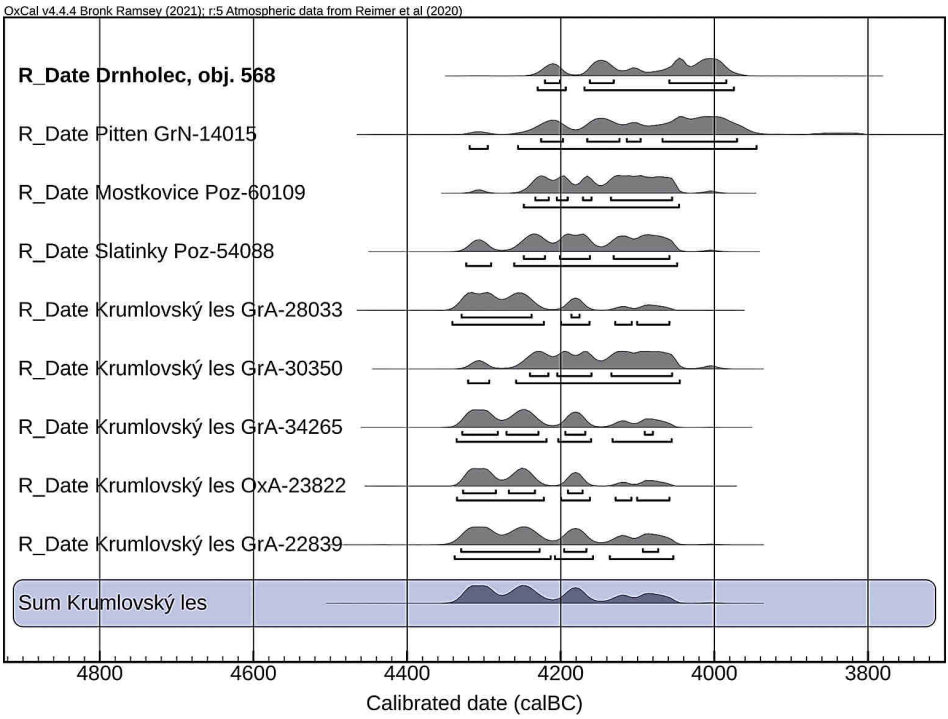

Fig. 19. Comparison of Epi-Lengyel calibrated dates from Moravia and Lower Austria.
Obr. 19. Srovnání epilengyelských kalibrovaných dat z Moravy a Dolního Rakouska.

In addition, we used a total of five radiocarbon dates from the mining area in Krumlovský les for comparison (*Oliva 2019*, 195), which, with their calibrated span, allowed us to assume, at least in part, that they are Epi-Lengyel. The data come from two shafts, a mining wall, a mining terrace, and a human skeleton that was deposited in the fill of a mining shaft (*Oliva 2010*, 32–37). By comparing the individual data and by summing all the data from Krumlovský les, it is clear that the calibrated radiocarbon dates are more likely to be older than the date from Drnholec. The only exception is the date (GrA-30350) from probe VI-9-2 in the mining terrace, which could be contemporaneous.

The pottery from the studied feature is not very suitable for typo-chronological analysis. The pottery is morphologically indifferent, and the only evidence of decoration is red paint found on a fragment of a small rim of the vessel. This fact, moreover, contradicts the current state of knowledge that painted pottery should not appear in the Epi-Lengyel context (*Košturík 1997*, 100).

Based on use-wear analysis, the bone awl was evidently used to perforate skins. The rounding and smoothing characteristic of this type of activity is clearly legible and only becomes apparent within a few centimetres of the tip. The tip itself is broken off, and there are a relatively large number of accidental striations above the fracture, indicating that the tool was not handled gently.

No signs of use-wear were observed on the blade of the flat stone axe. The identified shiny areas characterise the raw material.

Discussion

The results of the dynamic analysis showed that chert knapping did take place to some extent at feature no. 568, but not the first decortication and preparation phases. It is likely that the exhaustion of cores did not occur here either, and that these were taken elsewhere for further use. We cannot be inclined to assume that the entire collection had already been brought to the site ready-made. Minor debris, as well as reparation products that were unsuitable for working use in these particular cases, would not enter settlement feature no. 568 from another knapping site. The apparent but incomplete sequences from the same core suggest that some of the target blade production was taken elsewhere.

The use-wear analysis documented that the function of feature no. 568 was not primarily to produce debitage, and the vast majority of the artefacts recovered were used for work activities of varying intensity. Thus, it is indicative of a highly flexible knapping operation. Prepared cores were brought to the feature, and a larger collection of primarily blade products was produced. Of these, the major part was used at the spot and then discarded/dumped there. Those that appeared to be still usable were presumably taken elsewhere for further use, along with prospective cores. Most of the ad hoc tools were only used for a short-time period.

In terms of the function of the lithic artefacts left in the feature, their use in leather processing dominates, supplemented by their use on other animal materials. We do not believe that the feature was primarily used for butchering meat; such a feature would have been more heavily dominated by cutting tools, and certainly would not have found a use for endscrapers. Rather, it was a feature in or above which a complex of activities associated with the processing of hides–both soft or fresh and dry or matured–took place. This is evidenced by the range of osteological material, which is dominated by the periphery of domestic animal limbs that may have been associated with the skinned hides, and by the absence of macroscopic cutting marks on the bones. Animal skinning may have taken place here on a limited or haphazard basis, given the trapezoidal arrowhead present, which would also suggest a small proportion of hunted fauna in the range of skin sources. Knives may have been involved in both types of activities. However, as none of the bones left in the feature bore macroscopic evidence of cutting, it is reasonable to assume that the few stone tools for which use-wear analysis documented bone working were used for the production of bone artefacts or blanks that were then removed from their production place, rather than for the butchering of animal carcasses. We suggest that the sickle, whose primary purpose differs markedly from these described activities, may have been used secondarily as a knife, but this wear is not visible in the wear record on the conspicuous wear caused by cereal harvesting.

The documented depositional surface alterations, caused by deposition in wet organic waste, illustrate the reconstruction of activities occurring in direct spatial association with feature no. 568. Tools that were assessed as worn or blunt during the processing of hides were discarded directly into the waste accumulation of animal organics. If the main activity took place not in the object but above it, which seems practical, then some part of the collection may also consist of tools that were dropped, i.e. still in a functional state. The origin of the lithic collection in a few cores, the short-term use of ad hoc tools, and the lack of evidence of sharpening or repair of retouched tools (with the exception of the sickle mentioned above) all point to the relatively short-term use of the feature or its immediate

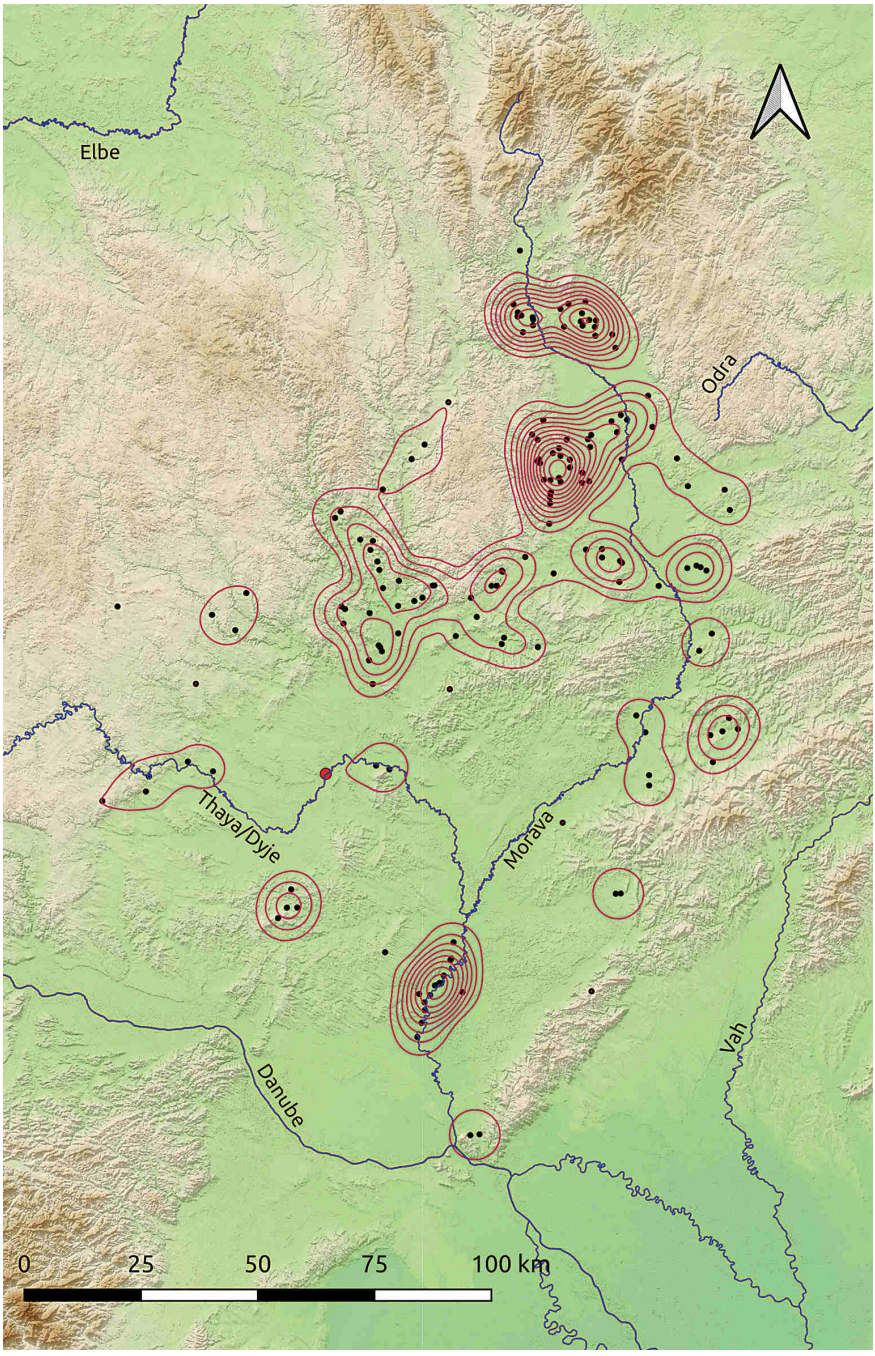

Fig. 20. Map of known Epi-Lengyel settlement sites in the Morava River Basin with analysis of kernel density of settlements. Drnholec is marked with a red dot (SD = 10 km).
Obr. 20. Mapa známých epilengyelských sídelních lokalit v povodí Moravy s analýzou jádrové hustoty sídlišť. Drnholec je označený červenou tečkou (SD = 10 km).

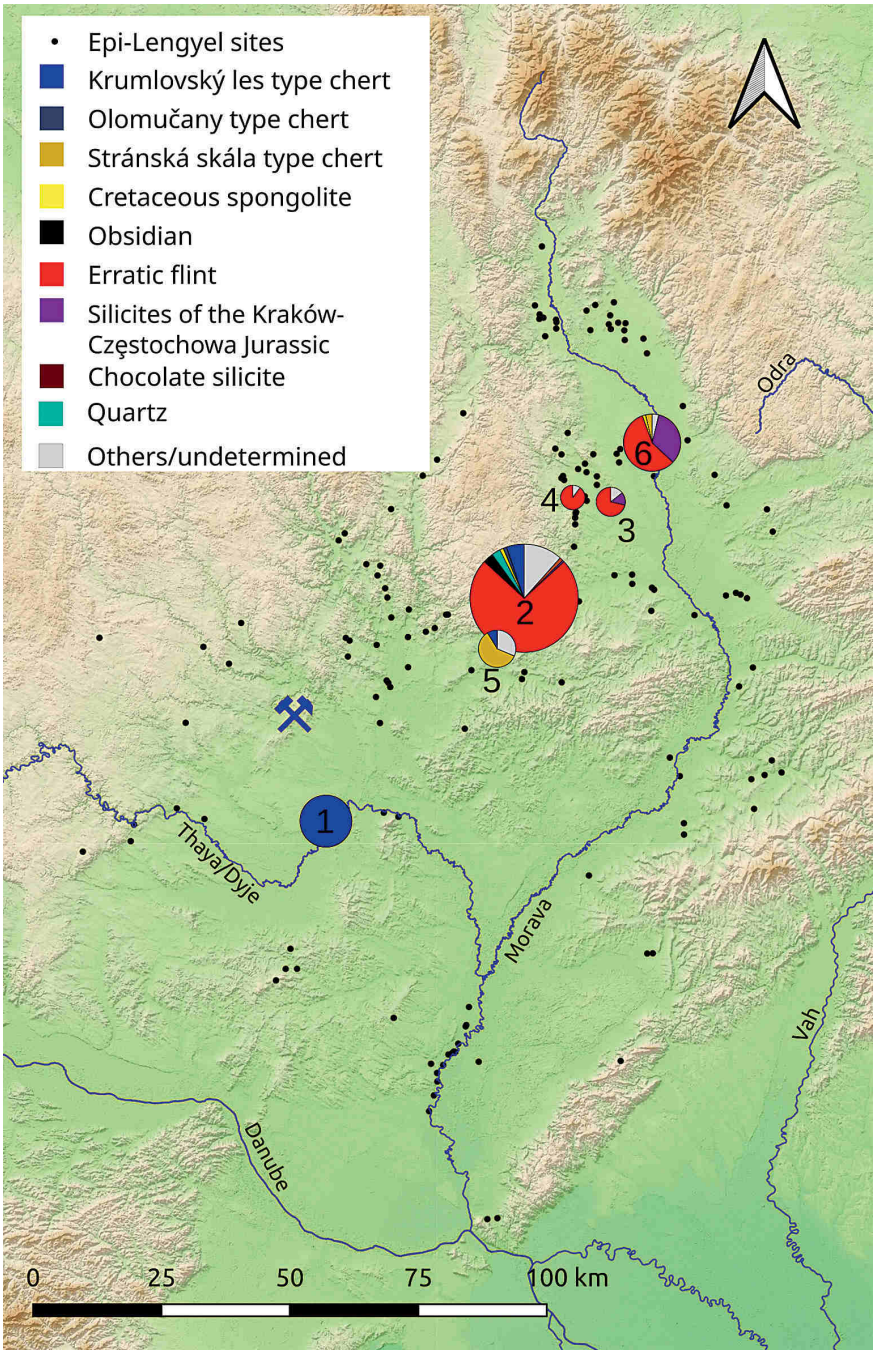

Fig. 21. Map of known Epi-Lengyel settlement sites in the Morava River Basin with pie charts showing the proportion of lithic raw materials. Mining symbol shows the source of Krumlovský les-type chert. See *table 5* for explanatory notes.
Obr. 21. Mapa známých epilengyelských sídelních lokalit v povodí Moravy doplněná o koláčové grafy zobrazující podíl jednotlivých surovin štípané industrie. Symbol těžby zobrazuje zdroj rohovce typu Krumlovský les. Vysvětlivky viz *tab. 5*.

surroundings for leatherworking and its rapid closure. As such, the chemistry of decomposition of organics interacting with moisture created a characteristic patina on the surface of most of the deposited artefacts.

A larger collection of lithics can also be used to analyse distribution patterns and thus for comparison with other published collections. Currently, we have available for comparison the raw material analysis of lithics with a total of 10 pieces or more from six sites in Moravia, plus another 10 sites with collections of fewer than 10 pieces (*tab. 5*). Spatial analysis carried out using pie charts (*fig. 21*) provides a regional spatial picture of the raw material preferences.

The south of the study area, represented only by the finding in Drnholec, which is the third-largest known assemblage, is raw-material uniform and oriented towards local chert resources of the Krumlovský les. The Vyškov Gate is a transitional area between the exploitation of resources from southern Moravia and the area within the range of the distribution of erratic flint (*Kaňáková 2018*). The widest range of raw materials, including obsidian and chocolate silicite, has so far been found in Drnovice, near Vyškov (*Košturík et al. 1998*). The Olomouc region already falls within the distribution range of eratic silicites (*Jelínek 2011*; *2019*), but is often accompanied by finds of Kraków-Częstochowa Jurassic silicites. This is a different pattern than we know from the previously published raw material spectra of the Proto-Eneolithic lithics from Bohemia, where raw materials from greater distances dominate (*Dobeš – Kostka – Stolz 2007*; *Dobeš – Kostka – Popelka 2010*).

Despite the small number of settlements with a known raw material determination, a strong preference for raw materials of local origin is evident in the distribution of raw lithic materials in Moravia. In Central Moravia, however, the presence of raw materials of distant origin is also documented. This fact is approximately correlated with the settlement density. If we focus on the southern part of the territory of today's South Moravian region, it is characterised by a low number of Epi-Lengyel settlements. On a large-scale rescue excavation in Štěrkovna n.p. Ingstav, near Dolní Věstonice (*Košturík – Šebela 1994*), six Epi-Lengyel features were found out of a total of 365 recorded archaeological features, and five features were discovered in the Věstonická Brána location (*Peška – Rakovský 1989*; *Rakovský 1990*). From other excavations, one feature is recorded from Hodonice – Na Vinici (*Čižmář 2003*) and from Dobšice – Mezi Potoky (*Geisler – Kovárník 1983*). Epi-Lengyel pottery is recorded in a stratigraphically ambiguous context from the elevated site of Šobes in Podmolí (*Čižmář 2001a*). To these findings we can add the presence of pottery in the Na Turoldu cave near Mikulov, which has a Late Lengyel to Jordanów-like character (*Košturík – Stuchlíková 1982*, 85), classified only generally in the culture with 'Moravian Painted Pottery'. A find of human bone from the same cave has also been assigned to the Epi-Lengyel by radiocarbon dating (unpublished). Regionally, southern Moravia, especially the wider Thaya region, surpasses the Mitterretzbach-Hofäcker site, where the foundations of an Epi-Lengyel house were discovered (*Lenneis 2017*, 265).

To understand the location of the study site in the context of Epi-Lengyel settlements over a larger area, we used a dataset on Neolithic and Eneolithic settlements in the Morava River basin (*Pajdla – Trampota 2021*), which was supplemented by recent published finds of new sites. The south of Moravia, including most of the adjacent Lower Austria, was sparsely populated and of low settlement density during the Epi-Lengyel. This makes this region distinct from Central Moravia, the Brno area, and the terrace on the right bank of the lower Morava River, where the main concentrations of Epi-Lengyel settlements are

located (*fig. 20*). It can be assumed that this state is not a reflection of the degree of archaeological prospection, since during most of the Neolithic, this region was populated quite densely, with settlement concentrations in Znojmo and under the Pavlov Hills (*Trampota 2015*).

All known settlements in the region are directly linked to the Thaya watercourse. The only settlement that is not precisely located was located in the area of Hrabětice (*Košturík 1997*), through which the Thaya also flows. Apart from settlement density, the south of Moravia differs from contemporary settlements farther north in the characteristic of immovable archaeological finds. Especially in areas with a higher density of settlements, we encounter finds of house foundations with rectangular and trapezoidal floor plans (Rousínov–Rousínovec and Olomouc–Slavonín: *Šmíd 2011*; *Kalábek – Kalábková 2020*), or even a possible circular enclosure in Seloutky (*Čižmář 2001b*). Such constructions can be expected precisely in areas with permanent settlements, possibly with higher social complexity or in conditions of year-round use.

In contrast, the sporadic finds of settlement pits in southern Moravia are evidence of the presence of a low-density human society, which may have been only seasonal. The findings of only a few settlement pits at individual sites are consistent with this.

Conclusion

The discovery of the settlement pit in Drnholec provided an important opportunity to expand our understanding of the nature and use of lithics in Epi-Lengyel period. The studied assemblage is homogeneous in terms of the raw material used (Krumlovský les-type chert), production technology, and functional purpose in hide processing. The results suggest a rather shorter duration of the use of the feature and its relatively rapid closure. The raw material is exclusively oriented to nearby sources, and this more or less reflects the contemporary tendency in the extraction of raw stone materials in Moravia. The peripheral nature of the site is reflected in the context of the density of Epi-Lengyel settlements, the absence of raw stone materials from distant sources, and the absence of extensive archaeological sources characterised by the discovery of an isolated settlement pit. These factors reflect the sporadic settlement of southern Moravia during the Epi-Lengyel period.

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Časně eneolitický objekt na zpracování kůží
Analýza epilengyelské štípané industrie z Drnholce, okr. Břeclav

Během archeologického výzkumu v roce 2018 byla objevena polykulturní lokalita v Drnholci na Lidické ulici (*obr. 1*), kde bylo zdokumentováno přes 100 objektů ze starší a mladší doby bronzové, z raného a vrcholného středověku (*obr. 2*). Artefakty z objektu 568 (*obr. 3*) se typologicky vymykaly charakteristice hmotné kultury zmíněných období a byly podrobeny detailnímu výzkumu. Nálezy keramických fragmentů nebylo možné typologicky charakterizovat. Pro stanovení chronologického zařazení souborů artefaktů bylo použito radiokarbonové datování (*tab. 4*; *obr. 18*), které řadí nalezený soubor do epilengyelu.

Objekt 568 byla ca 50 cm hluboká zahloubená jáma nepravidelného tvaru, v severní části narušená objektem z doby bronzové. Výplň byla složená ze dvou vrstev, jílovité (k 200) a písčité (k 221). Z obou kontextů pocházejí nálezy zvířecích kostí a keramiky. Ve spodním kontextu 221 bylo dále nalezeno 45 ks štípané industrie, jedna sekyrka z metabazitu typu Želešice a jedno kostěné šídlo s ulomenou špičkou (*obr. 4*).

Předmětem detailní analýzy je štípaná industrie, která je zkoumaná především z hlediska suroviny, technologie těžby, dynamické analýzy a traseologie. Použitou surovinou je především rohovec typu Krumlovský les (varieta I tvoří 11,1 % a varieta II 84,4 % z celku), dva kusy (4,5 %) byly určeny pouze obecně jako jurský rohovec. Je tedy pravděpodobné, že celý soubor pochází z Krumlovského lesa. Zřetelná preference homogenních jemnozrnných hmot koresponduje s převahou patek, které odpovídají štípání měkkým otloukačem (*obr. 5*), a zaměření na paralelní jednopodstavovou exploataci s výrazným podílem čepelové debitáže. Většina dochovaných patek je plochá, tento typ patky není vyhrazen žádné metodě sbíjení, typu debitáže nebo technice úderu. Naproti tomu zjištěné patky lomené a fasetované průkazně korespondují s metodou paralelní exploatace, čepelovými produkty a varietou II rohovce z Krumlovského lesa. Patky kortikální jsou spojeny s příznaky užití tvrdého otloukače a nepravidelnou úštěpovou exploatací.

V souboru zcela chybí jádra a vodící hrany, a produkty dekortikační fáze jsou doloženy jen dva. Doklady první fáze exploatace jader tedy chybí. Naopak jsou v kolekci poměrně hojné reparační úštěpy a drobný odpad v podobě šupin i třísek. Na základě charakteristik a barvy hmoty lze také identifikovat několik setů prokazatelně pocházejících z téhož jádra (*obr. 6*, *7*). Fáze vlastní exploatace připravených jader probíhala přímo v objektu nebo na jeho okraji. Část produkce byla odnesena jinam, část byla na místě retušována a používána. Na spektru dynamické analýzy (*tab. 1*) je podíl neopotřebené debitáže, ad hoc nástrojů a retušovaných nástrojů vyrovnaný. Cílová debitáž vykazuje stopy používání bez nebo s využitím modifikace hrany retuší (*obr. 8*). Typologicky šlo o škrabadla, nože, ojedinělou pilku, srp, vrták a příčnou šipku.

Celý soubor byl podroben traseologické analýze; 2/3 souboru vykázaly průkazné opotřebení, což svědčí o výrazném pracovním zaměření souboru i objektu, v němž byl nalezen. Vzhledem k tomu, že k těžbě debitáže docházelo v objektu, a došlo zde také k depozici, celý operační řetězec souboru ŠI se odehrál přímo na místě. Všech 11 typologických škrabadel bylo opotřebeno v typických lokacích, osm z nich průkazně po oškrabování kůže (*obr. 9*). Některá byla pro zvýšení efektivity práce upevněna do násady (*obr. 10*). Také další nástroje byly používány na řezání mokré (*obr. 12*) nebo suché (*obr. 14*) kůže, řezání (*obr. 13*), oškrabování (*obr. 11*) a vrtání (*obr. 16*) kosti. S procesy spojenými s dělením zvířecích těl a zpracováním jejich masa a kůže, může být spojena i příčná šipka, která sama žádné opotřebení nenese, jak je obvyklé. To by ukazovalo na fakt, že přinejmenším část bouraných zvířat pocházela z úlovku. Také ad hoc nástroje byly vesměs používané dostatečně dlouho, aby vzniklo identifikovatelné opotřebení. Odpovídají činnostem identifikovaným výše. Funkčně odlišný od celého souboru je pouze srp, který nese stopy několika cyklů intenzivního používání, mezi nimiž byl přiostřován, a také doklady upevnění do násady (*obr. 15*). Charakteristická ostrůvkovitá modrobílá patinace (*obr. 17*), která dokládá depozici v rychle degradujícím a vlhkém organickém materiálu, byla identifikována na 82,2 % souboru.

Dále byla provedena základní zooarcheologická analýza souboru zvířecích kostí o počtu 79 ks (*tab. 3*), ze kterého bylo možné určit druh v případě 25 %. Dominují zde pozůstatky domácích zvířat s výjimkou kostí zajíce a křečka, u nichž nelze vyloučit recentní stáří. Z domestikovaných zvířat jsou zde zastoupeni nejvíce drobní přežvýkavci (ovce-koza), dále tur domácí a prase domácí. Ojedinělým nálezem kosti hlezenní je zde potvrzena přítomnost koně. Stav kostí dokládá převahu subadultních nebo adultních jedinců.

Výsledky dynamické analýzy doložily, že v objektu 568 v jisté míře probíhalo štípání silicitů, nikoli však první dekortikační a preparační fáze. Pravděpodobně zde nedošlo ani k dotěžení jader, a ta byla odnesena k další potřebě jinam. Drobný odpad, stejně jako reparační produkty, které se v těchto konkrétních případech nehodily k pracovnímu použití, by se do objektu z jiného místa štípání nedostaly. Zjevné, ale neúplné sekvence z téhož jádra svědčí o tom, že část cílové čepelové produkce byla odnesena jinam.

Traseologie doložila, že funkcí objektu 568 nebyla primárně výroba debitáže, a naprostá většina zjištěných artefaktů byla různě intenzivně používána k pracovním činnostem. Svědčí to tedy o značně flexibilním štípání. K objektu byla přinesena připravená jádra, byla z nich vytěžena větší kolekce především čepelových produktů. Z nich byla valná část na místě použita a poté odložena/vyhozena do objektu.

Z hlediska funkce štípaných artefaktů dominuje použití při zpracování kůže a doplňuje jej použití na jiné živočišné materiály. Nalezené artefakty odrážejí komplex činností spojených se zpracováním kůží, a to měkkých, čerstvých i starších. O tom svědčí i spektrum zooarcheologického materiálu, v němž převažují periferie končetin domácích zvířat, které mohly být se staženou kůží spojeny; a také to, že na kostech nebyly pozorovány makroskopické stopy řezání. Přítomnost trapézovité šipky naznačuje i malý podíl lovené fauny ve spektru zdrojů kůže. Nože se mohly zapojovat do obou typů aktivit. Žádné kosti ponechané v objektu však nenesly makroskopické stopy řezání, proto je na místě se domnívat, že nepočetné kamenné nástroje, u nichž traseologie doložila opracování kosti, sloužily k výrobě kostěných artefaktů či polotovarů, které byly poté odneseny z místa své výroby, a nikoli k porcování zvířecích těl. Srp, jehož primární účel se výrazně od těchto popsaných aktivit liší, mohl být sekundárně používán jako nůž, ale v traseologickém záznamu není toto opotřebení na nápadném opotřebení způsobeném obilovinami viditelné.

Původ kolekce ŠI v několika málo jádrech, krátkodobost používání ad hoc nástrojů, absence dokladů přiostřování a oprav retušovaných nástrojů (s výjimkou výše zmíněného srpu), to vše svědčí o poměrně krátkodobém používání objektu, nebo jeho nejbližšího okolí, ke zpracování kůží a jeho rychlém uzavření tak, že chemismus dekompozice organik spolupůsobící s vlhkostí vytvořil charakteristickou patinaci na povrchu většiny deponovaných artefaktů.

V kontextu soudobých sídelních lokalit (*obr. 20*) je oblast jižní Moravy charakteristická nízkým podílem nalezených objektů i na rozsáhle zkoumaných lokalitách. Dále je zjevné, že osídlení okolní oblasti má velmi nízkou hustotu, čímž se výrazně liší od předchozích fází neolitu. Výraznou koncentraci epilengyelských sídlišť lze sledovat na střední Moravě, v okolí Brna a na dolním toku Moravy.

Surovinové spektrum bylo srovnáno se všemi publikovanými soubory štípané industrie na Moravě (*obr. 21*; *tab. 5*). Jih sledovaného území reprezentovaný pouze nálezem v Drnholci, který je třetím největším známým souborem, je surovinově uniformní a orientovaný na lokální zdroje rohovce typu Krumlovský les. Vyškovská brána je zřejmě přechodnou oblastí mezi využíváním zdrojů z jižní Moravy a oblastí v dosahu distribuce silicitů glacigenních sedimentů (*Kaňáková 2018*). V Drnovicích u Vyškova (*Koštuřík et al. 1998*) bylo nalezeno dosud nejširší spektrum surovin, včetně obsidiánu a čokoládového silicitu. Střední Morava spadá do distribučního areálu silicitu glacigenních sedimentů (*Jelínek 2011*; *2019*), ovšem často doprovázeného nálezy silicitů Krakovsko-čenstochovské jury.

Nález sídelního objektu v Drnholci poskytl významnou možnost rozšířit poznání charakteru a využití především štípané kamenné industrie. Studovaný soubor štípané industrie je homogenní z hlediska použité suroviny rohovce typu Krumlovský les, produkční technologie i funkčního určení. Výsledky naznačují spíše kratší trvání užívání objektu a jeho relativně rychlé uzavření. Surovina je výhradně orientovaná na nedaleké zdroje, což víceméně odráží soudobou tendenci v získávání kamenných surovin na Moravě. Periferní charakter lokality se projevuje v kontextu hustoty epilengyelských sídlišť, absence kamenných surovin ze vzdálených zdrojů a absenci rozsáhlejších archeologických pramenů charakterizované nálezem ojedinělé sídlištní jámy. Tyto faktory odrážejí sporadické osídlení jihu Moravy v epilengyelském období.

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