Litikum - Journal of the Lithic Research Roundtable 10 (2022), 23–30
HU ISSN 2064-3640 • litikum.hu • https://doi.org/10.23898/litikuma0032

RESEARCH ARTICLE

Lithic typological analysis of new surface finds from the Megyaszó–Szelestető site, Hungary

Kristóf István Szegedi*

* *National Institute of Archaeology, Hungarian National Museum, Budapest; Faculty of Earth and Environmental Sciences and Engineering, University of Miskolc, Miskolc 1088, Budapest, Múzeum krt. 14-16. szegedi.kristof@mnm.hu*

Abstract

This paper aims to provide new archaeological data for the Upper Palaeolithic in Eastern Central Europe (ECE) based on the typological analysis of surface finds from the Megyaszó–Szelestető site (MSZT). The discussed site is located in the Szerencs Hills, in the southern part of the Western Carpathians. The lithic assemblage of MSZT was considered previously a Pavlovian industry with Aurignacian features. The result of the comparative lithic typological investigation presented in this article contradicts the earlier view and suggests that the lithics can be associated with multiple occupations of the site by hunter-gatherers. Presumably, the site must be heavily eroded, the archaeological assemblage is mixed and some part of it could be dated to the Early, Middle and Late Upper Palaeolithic periods as well.

Keywords

Upper Palaeolithic, Late Gravettian, Late Epigravettian, Western Carpathians, lithic typology

Cite as

Szegedi, K.I. (2022). Lithic typological analysis of new surface finds from the Megyaszó–Szelestető site, Hungary. *Litikum – Journal of the Lithic Research Roundtable,* 10, pp. 23–30. https://doi.org/10.23898/litikuma0032

Article history

Received: 5 April 2022. Accepted: 8 April 2022. Published: 5 June 2022.

1. Introduction

MSZT is located in the vicinity of the village Megyaszó, in the northeastern part of Hungary, in the North Hungarian Mountains, which is a part of the Western Carpathians. It is found on the top and slopes of a 230-meter-high cultivated hill (Fig. 1). Geologically, the site is situated on the 'Kishuta Rhyolite Division', dated to the Miocene (Gyalog 2005, 125). Silicified pumiceous rhyolite tuff pieces are found on the surface as well (Fig. 2). Soil erosion and colluvium on the slopes were reported here (Dobosi & Simán 1996, 9).

K. Simán recognized the first lithics during field surveys in 1986 (Hellebrandt & Lovász 1988). She suggested an 'Upper Palaeolithic or Early Gravettian' age for the finds. The site was excavated by V. T. Dobosi and K. Simán in 1993 and 1994 (Dobosi & Simán 1996). Viola T. Dobosi reported 8263 artefacts in sum. Two archaeological layers were observed, both of which yield sparse lithics and no bones and hearths at all. Nonetheless, lithics were found in various stratigraphic positions and 94% of the finds were collected from the ploughed humus level and the surface. Of the whole assemblage only 1% derived from the upper archaeological layer, and 5% from the lower one. V. T. Dobosi and K. Simán classified the assemblage culturally as an older phase of the Gravettian with Aurignacian elements and claimed a relationship with the 'Pavlovian' site Bodrogkeresztúr–Henye (Dobosi–Holl 2013; Dobosi–Simán 1996, 18) and Hont-Parassa III/Orgonás (Dobosi & Simán 2003). Their cultural classification was based on carinated endscrapers (n=6 from the surface, n=1 from the upper archaeological layer), nosed endscrapers (n=1 from the humus level, n=1 from the upper archaeological layer), Gravette points (n=4 from the surface), and Aurignacian blades (n=2 from the surface). The cultural attribution of the site was supported by a radiocarbon date, 27,070±680 (Deb-5372) (Dobosi 2000, 80), calibrated with OxCal

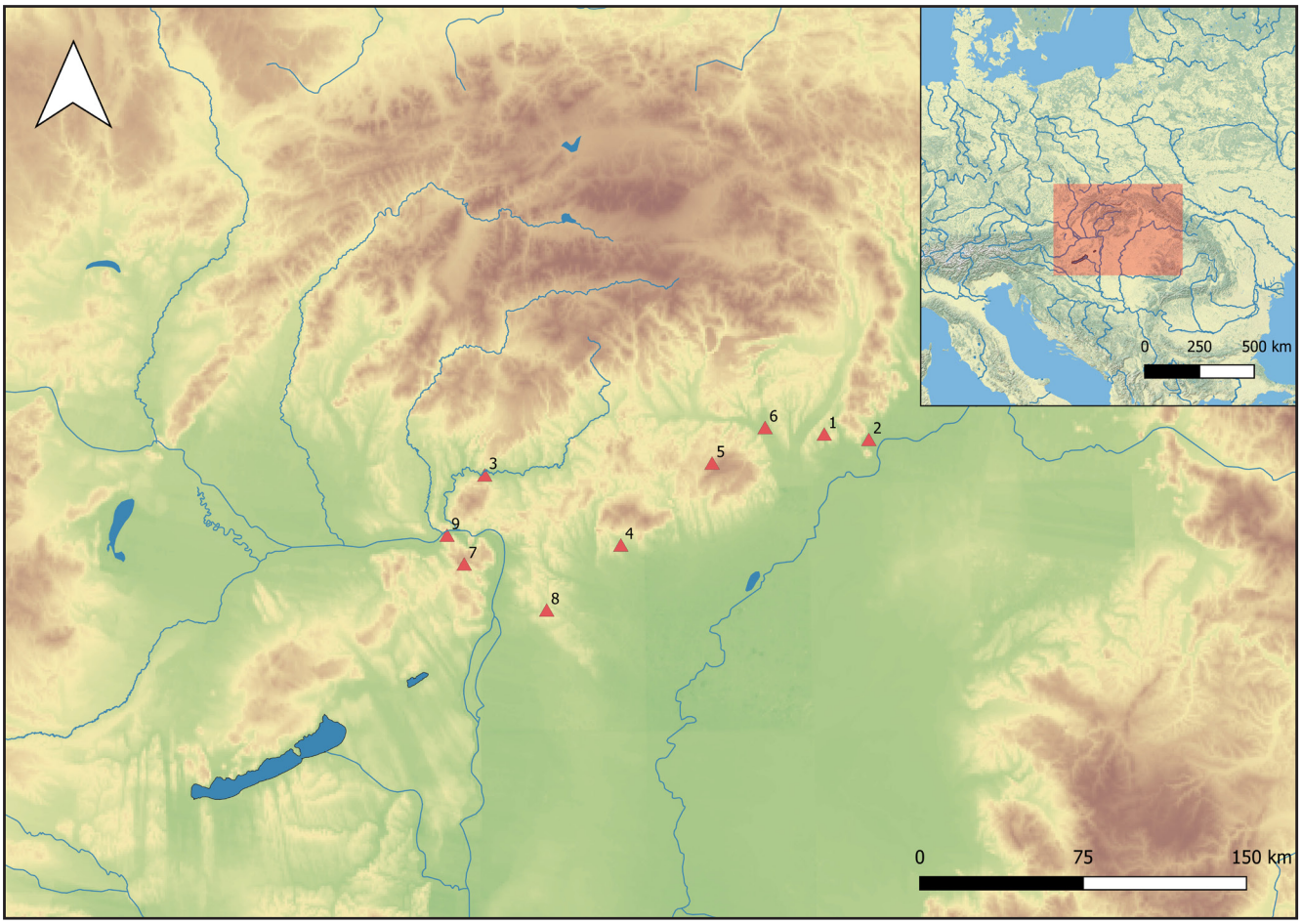


Figure 1 Sites mentioned in the text: 1. Megyaszó–Szeletestető; 2. Bodrogkeresztúr–Henye-hill; 3. Hont–Parassa III; 4. Nagyréde; 5. Istállőskő-cave; 6. Sajószentpéter; 7. Pilisszántó-rock-shelter; 8. Pécel; 9. Esztergom–Gyurgyalag. Edited by László Pokorni.

4.4. to 33,000–30, 000 cal BP (Reimer *et al.* 2020). The location or the material of the sample is not published.

Due to stratigraphic and chronological issues the site's archaeological reliability was questioned (Lengyel 2008–2009) as well as the typological integrity of the lithic material (Lengyel 2018, 9).

The paper aims to resolve the controversy about the chronology and cultural attribution of the site.

2. Materials and methods

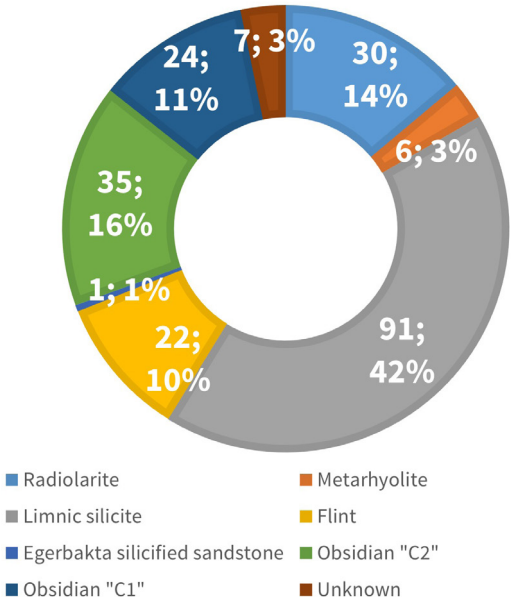
As the most important culturally diagnostic lithic tools were found on the surface, the earlier published results are re-evaluated based on the evaluation of lithic tools acquired during recent field surveys.

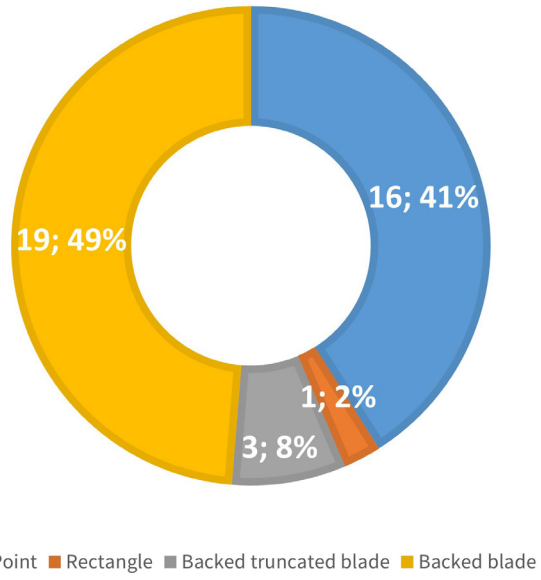
The here newly presented archaeological material (n=6373) was collected during field surveys of D. Hajdú and Gy. Lengyel. A small part of the collection was subject to a BA thesis at the University of Miskolc (Bartus 2019).

As the lithics were collected from the surface, only retouched knapped stone tools were investigated (n=216), which is 3.4% of the total collection. Lithic raw materials were identified macroscopically following A. Přichystal (2010), so the various silicites formed in a freshwater limnic environment were grouped as 'limnic silicites'. According to their origin, lithic raw materials were divided into three categories (Lengyel 2018). The provenance of local raw materials is defined in a 10-kilometre radius. Regional ones are found 10 to 100 kilometres from the site. Distant ones are from more than 100 kilometres from the site. I do not make further statements regarding the composition of the raw material or the lithic technology of the assemblage, since the artefacts are collected from the top of an Ap soil horizon that has been disturbed by modern, agricultural human activity and must be mixed.

Due to heavy ploughing of the site, in some cases, lithics found on the surface were damaged and refractured. Therefore 'tools' with fresh, unpatinated scars were not considered authentic tools.

Tooltypes were divided into two groups, domestic tools and armatures (Lengyel 2016). Domestic tools consist of end-scrapers, burins, edge-retouched tools, splintered tools, borers, truncations and combined





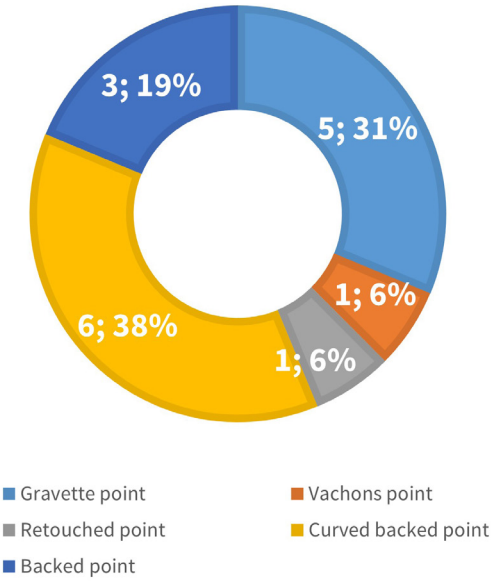
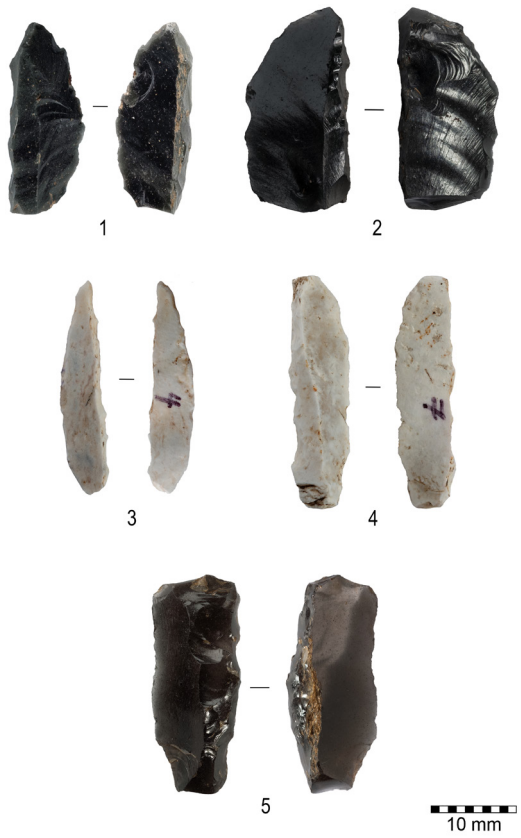


Figure 2 Silicified pumiceous rhyolite tuff pieces from the surface of the site. Photos by Eszter Duong-Li. **Figure 3** (top right). Raw material compostion of the tools. **Figure 4** (middle right). Categories within the armature group. **Figure 5** (bottom right) Categories within the group of points.

tools. The armature category was further subdivided into retouched points, backed points, backed blades, rectangles curved-backed points, arched backed points, Gravette/micrograve tte, fléchette, Vachons points, and shouldered points. Blades and bladelets were not differentiated, since the surface material must be mixed and the production modes or size ranges cannot be accurately determined. Typological categories were based on the work of P. Demars and P. Laurent (1989). I paid special attention to the armatures and especially, to the points, as these tools are used to emphasize cultural differences in the recently revised Middle and Late Upper Palaeolithic of ECE since domestic tools in most cases seem to be part of the daily life of hunter-gatherers and they are used for general tasks (Lengyel 2016; 2018).

3. Results

Dominant raw materials (Fig. 3) are the limnic silictes in the tool assemblage (n=91, 42%), which is not surprising since outcrops of Tertiary siliceous sediments from limnic basins of the Tokaj Mountains



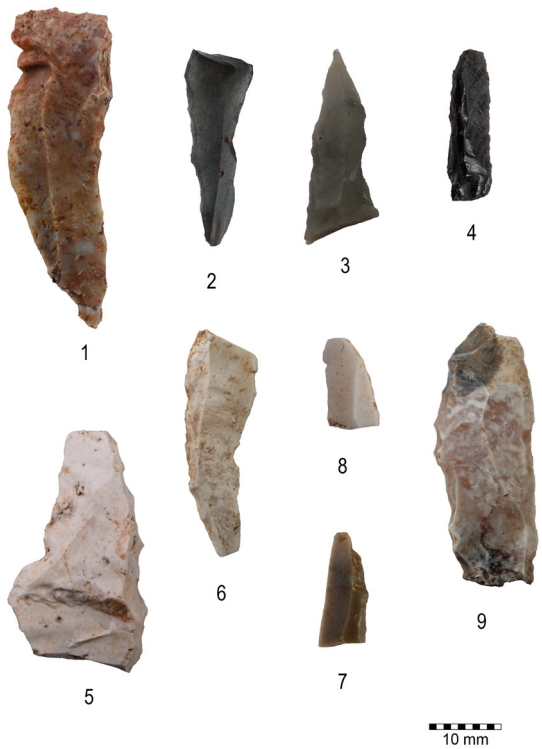


Figure 6 (upper left)**.** Megyaszó–Szelestető surface finds: 1. nosed carinated endscraper; 2–3. carinated endscrapers; 5–7. blades with Aurignacian retouch. **Figure 7** (upper right). Megyaszó–Szelestető surface finds: Gravette-points. **Figure 8** (lower left) Megyaszó–Szelestető surface finds: 1. Vachons-point; 2. retouched point; 3. rectangle. **Figure 9** (lower right) Megyaszó–Szelestető surface finds: 1–3. backed points; 4–9. curved backed points. Photos by Eszter Duong-Li.

are found within a radius of 35 kilometres (Szekszárdi *et al.* 2010). This raw material is often highly patinated, inclusions are observable on the surfaces of the lithics and it has great variability in colour.

The second most abundant raw material is obsidian which was also formed as a result of Neogene volcanic activity. Two varieties were found in the assemblage. "C1" type (n=24, 11%) is more transparent and has a glassy texture. "C2" type (n=35, 16%) is not transparent and has a blacker and greyish colour. Sources of obsidian are in the Eperjes–Tokaj-Mountains, close to the site (Biró 2004). A total of 14% (n=31) of the tools are made from radiolarite, probably originating in the White Carpathians (Slovakia), where it could be collected from primary autochthonous and allochthonous sources (Nemergut *et al.* 2012). It appears in grey, green, brown and yellowish colours as well. A portion of the radiolarites could be related to the Transdanubian sources of the Bakony Mountains.

Flint is also present in the material (n=22, 10%). These tools are heavily white, white-blueish and white-brownish patinated, so their exact origin is not definable. The most we can say is that they are of northern erratic origin. The number of tools made from metarhyolite (n=6, 3%) is low. Its source lies approximately 45 kilometres away in the vicinity of Bükkszentkereszt (Vértes & Tóth 1963) and Bükkszentlászló (Tóth 2011). A single backed blade made from silicified sandstone from Egerbakta is also noteworthy.

Raw material sources can be categorized by their distance from the MSZT site. Limnic silictes can be considered both local and regional raw materials since these are found less than 10 kilometres and also between 10–100 kilometres from the site. Obsidian and metarhyolite can be counted as regional raw materials. Since the two assumed radiolarite sources are equally around 250 kilometres far from the site, they are counted as distant raw materials.

The material is dominated by blades as the main blank type (n=161, 74,5%), and flakes are represented in smaller numbers (n=55, 25.5%). Domestic tools are the most numerous (n=177, 82%). Within the previous category, endscrapers, edge-retouched tools, burins and truncations are abundant. Three splintered pieces were also found.

In the category of armatures (n=39, 18%), backed blades make up almost 50% of the assemblage (Fig. 4). Backed-truncated blades, a single rectangle and points were found as well. The group of points consist of curved backed points (n=6), Gravette points (n=5), backed points (n=3), a Vachons point and a retouched point (Fig. 5).

Despite their small number, the three thick blades could be recognized as Aurignacian blades and four carenoid endscrapers. It is worth mentioning that one of the blades (Fig. 6: 5) is strangled and one particular endscraper made on a flake blank is a nosed endscraper (Fig. 6: 1).

One of the five slender Gravette points is broken on the distal part, although the inverse retouch opposed to the backed edge is visible on the proximal part (Fig. 7.5). The remaining four Gravette points are having inverse retouch at their distal part (Fig. 7: 1–4). The earlier mentioned rectangle is made on an unusual, thick limnic silicite blade blank and backed ventrally, although this piece is not typical (Fig. 8: 3).

One Vachons point was identified (Fig. 8: 1). The point has a lanceolate, narrow shape, it was made on a broken blade and has inverse retouch at the base and the distal end. A retouched point (Fig. 8: 2), similar in shape is also part of the assemblage, but it has no inverse retouch, just an abrupt one on both edges. Out of the six curved backed points (Fig. 9), two are broken distal parts, although judging from the curvature of the backing, they were diagnosed as curved backed points. Four curved backed points are made from limnic silicite, one is from obsidian and one is from radiolarite.

4. Discussion

The typological composition of the discussed assemblage indicates that the MSZT site was visited by hunter-gatherers several times during the Upper Palaeolithic. Some tools might be associated with the Early Upper Palaeolithic Aurignacian industry, like the thick blades with Aurignacian retouch, carenoid and nosed endscrapers. Such lithic tool types were recognized on open-air Aurignacian sites in the vicinity of Nagyréde (Lengyel *et al.* 2006), Istállós-kő-cave (Vértes 1965, XLV 4.) and throughout ECE as well (Demidenko et al. 2021). Blades with Aurignacian retouch are reported in the earlier publication (Dobosi–Simán 1996, Fig. 14).

The above-mentioned types are often considered fossile directeurs of the European Aurignacian (Demars & Laurent 1989). Carenoid endscrapers are distinctive features of Early Upper Palaeolithic industries, although in some cases these are also characteristic of other Upper Palaeolithic industries as well, for example on Early Epigravettian (EE) sites in ECE (Béres & Demidenko 2021, Fig. 8; Neugebauer-

Maresch *et al.* 2016, Tafel 11). That is to say, a human occupation at the site, dated to the Last Glacial Maximum, cannot be ruled out, since EE armature is characterized solely by backed blades and retouched points (Lengyel *et al.* 2021, Table 5–6), thus it cannot be securely isolated.

Despite their small number, some lithics certainly can be dated to the Late Gravettian, (LG) as these are fossiles directeurs of these industries. The most evident is the presence of the five Gravette points, as this tool type is mostly missing from the archaeological record of ECE in Epigravettian (Lengyel 2016). The Vachons point and the rectangle also have close links to the LG site's lithic tool composition in Hungary, like Bodrogkeresztúr, Sajószentpéter and Pilisszántó-rock-shelter (Dobosi & Vörös 2000; Lengyel 2016). LG occupation of the site is further supported by the presence of possible shouldered points, published earlier (Dobosi & Simán 1996, Fig. 12.). Szeleta-cave's layer 5 and 6 also seems to be analogous, as those included Gravette points, two shouldered points and two retouched points (Lengyel *et al.* 2016, Fig. 4). Apparently, typical LG armature is present on the site, except Kostienki knives, which are not yet recognized on Hungarian LG sites. The latter seems to strengthen the argumentation of V. T. Dobosi about the Gravettian cultural identification of the site. Although, the 'older phase of Gravettian with Aurignacien elements' cannot be proved. First, typical Early Gravettian or Pavlovian tool types are missing from the site. Secondly, the LG is dated between 30 and 26 ka calBP in the ECE (Wilczyński *et al.* 2020) and the latest absolute dates for Aurignacian in Hungary are falling between 35 and 33 ka calBP (Davies & Hedges 2008–2009). Therefore, there is a 3000-year chronological hiatus between the two cultures. In light of the new absolute dates of the Late Gravettian in the ECE, the earlier published 33,000–30, 000 cal BP age of the site still looks inconsistent.

It is conceivable that curved backed points and backed points point to a Late Epigravettian (LE) occupation of the site, considering these are characteristic armatures of it (Béres *et al.* 2021; Lengyel *et al.* 2021). Contemporary research proved that the LE can be reliable absolute dated between 20 and 14.7 ka cal BP and it occupied southern Poland, Moravia and the Carpathian Basin. Archaeological record implies that the Carpathian Basin was inhabited by LE hunter-gatherers in the post-LGM period, although most of the sites are found in the Transdanubia except the yet undated site Pécel (Markó & Gasparik 2018), which is located in the Great Hungarian Plain, approximately 30 kilometres from the closest Transdanubian LE site. If LE settlement indeed can be proved, that makes the MSZT site the easternmost and first LE assemblage from the Hungarian part of the Western Carpathians. Besides, LE assemblages are described by a high frequency of armatures like backed blades, which makes up almost 50% of the discussed lithic material. In such a manner, the abundance of backed blades could also point to a LE presence at the site. Presumably, a part of earlier published lithics can be regarded as curved backed and backed points (Dobosi & Simán 1996, Fig. 12) and a trapeze-rectangle can be assumed as well (Dobosi & Simán 1996, Fig. 13). Analogous geometric trapeze-rectangles are recognized in the LE assemblage of Esztergom–Gyurgyalag (Lengyel 2018) and a curved backed point, retouched at the proximal part of the blade, similar to the one found at MSZT (Fig. 9.6). Nevertheless, the limnic silicite, obsidian and radiolarite raw materials of the discussed curved backed points differ from the earlier published one's, as those are entirely made from Transcarpathian flints (Lengyel 2018).

5. Conclusion

The lithic typological assessment of surface finds from the MSZT site demonstrated that the assemblage should not be considered uniform, rather multiple occupations can be identified. Evidence shows that distinctive tool types of Aurignacian – conditionally EE – LG and LE can be identified. Hunter-gatherer communities must have been attracted by the proximity of local raw materials, which are still collectable from eroded Tertiary deposits. More precise relative and absolute dating of the site is necessary for future interpretations.

Acknowledgements

The research was supported by the National Institute of Archaeology, Hungarian National Museum.

I am deeply indebted to Dezső Hajdú and György Lengyel for their fieldwork and for allowing me to study the archaeological material.

I am appreciative of the assistance of Eszter Duong-Li, Tímea Csaba, László Pokorni and Zoltán Ferenc Tóth (Hungarian National Museum) for the photos and the editing of tables.

Statements

Data availability statement. The author confirms that the data supporting the findings of this study are

available within the article and its supplementary materials.

Disclosure statement. No potential conflict of interest was reported by the author.

Funding statement. The author received no financial support for the research and the publication of this article.

Copyright

References

Bartus, Zs. (2019). Új*abb adatok a Megyaszó-környéki felső-paleolitikum kultúrájának kérdéséhez*. [New questions about the Upper Palaeolithic cultures around Megyaszó] BA thesis. Miskolc University.

Béres, S., Demidenko Yu. E. (2021). Vác 1 Epigravettian loci at the Danube Bend in North-Central Hungary. *Přehled výzkumů,* 62(1), pp. 29–46. https://doi.org/10.47382/pv0621-01

Béres, S., Cserpák, F., Moskal-del Hoyo, M., Repiszky T., Sázelová, S., Wilczyński J., Lengyel, Gy. (2021). Zöld Cave and Late Epigravettian in Eastern Central Europe. *Quarternary International,* 587–588, pp. 158–171. https://doi.org/10.1016/j.quaint.2020.09.050

Biró, T.K. (2004). A kárpáti obszidiánok: legenda és valóság. *Archeometriai Műhely,* 1(1), 3–8.

Davies, W., Hedges R. (2008–2009). Dating a type site: Fitting Szeleta cave into its regional chronometric context. *Praehistoria,* 9–10, pp. 35–45.

Demars, P.Y., Laurent, P. (1989). *Types d'outils lithiques du paleolithique superieur en Europe*. Paris: Centre National de la Recherche Scientifique.

Demidenko, Yu. E., Škrdla, P., Rios-Garaizar, J. (2019). In between Gravettian and Epigravettian in Central and Eastern Europe: a peculiar LGM Early Late Upper Paleolithic Industry. *Přehled výzkumů,* 60(1), pp. 11–257.

Demidenko, Yu. E., Škrdla, P., Rácz B., Nemergut, A., Béres S. (2021). The Aurignacian in the Carpathian Basin of Eastern Central Europe and its Proto-Aurignacian industry type. In: R. Dobrescu, A. Boroneant & A. Dobos (eds). *Scripta Praehistorica. Miscellanea in honorem Mariae Bitiri Dicata.* Târgovişte: Institutul de Arheologie Vasile Pârvan (Materiale si Cercetari Arheologica. Serie Noua, Supplementum I), pp. 141–181. https://doi.org/10.3406/mcarh.2021.2207

Dobosi, T. V. (2000). *Bodrogkeresztúr–Henye (NE Hungary) Upper Palaeolithic Site.* Budapest: Magyar Nemzeti Múzeum.

Dobosi, T. V. (2016). Tradition and modernity in the lithic assemblage of Mogyorósbánya Late Palaeolithic site. *Acta Archaeologica Academiae Scientiarum Hungaricae,* 67, pp. 5–30. https://doi.org/10.1556/072.2016.67.1.1

Dobosi, T. V., Holl, B. (2013). A gravetti telepek topográfiája. [Topography of Gravettian sites] *Litikum - Journal of the Lithic Research Roundtable,* 1, pp. 73–88. https://doi.org/10.23898/litikuma0006

Dobosi, T. V., Simán, K. (1996). New Upper Palaeolithic site at Megyaszó-Szelestető. *Communicationes Archaeologicae Hungariae,* 1996, pp. 5–22.

Dobosi, T. V., Simán, K. (2003). Hont-Parassa III, Orgonás, Upper Palaeolithic settlement. *Communicationes Archaeologicae Hungariae,* 2003, pp. 15–29.

Dobosi, T. V., Vörös, I. (1987). The Pilisszántó I. Rock-shelter revision. *Folia Archaeologica,* 38, pp. 7–64.

Gyalog, L. ed. (2005). *Magyarázó Magyarország földtani térképéhez (az egységek rövid leírása).* Budapest: Magyar Állami Földtani Intézet.

Hellebrandt, B.M., Lovász, E. (1988). A Herman Ottó Múzeum ásatásai és leletmentései 1985-1986. *A Herman Ottó Múzeum Évkönyve* 25–26, pp. 267–282.

Lengyel Gy. (2008–2009). Radiocarbon dates of the "Gravettian entity" in Hungary. *Praehistoria,* 9–10, pp. 241–263.

Lengyel, Gy. (2016). Reassessing the Middle and Late Upper Palaeolithic in Hungary. *Acta Archaeologica Carpathica,* 51, 47–66.

Lengyel, Gy. (2018). Lithic analysis of the Middle and Late Upper Palaeolithic in Hungary. *Folia Quaternaria,* 86, pp. 5–157. https://doi.org/10.4467/21995923FQ.18.001.9819

Lengyel, Gy., Béres S., Fodor L. (2006). New lithic evidence of the Aurignacian in Hungary. *Eurasian Prehistory* 4(1–2), pp. 79–85.

Lengyel, Gy., Mester, Zs., Szolyák P. (2016). The Late Gravettian and Szeleta Cave, northeast Hungary. *Quaternary International,* 406, pp. 174–183. https://doi.org/10.1016/j.quaint.2015.09.014

Lengyel, Gy., Bárány, A., Béres, S., Cserpák, F., Gasparik, M., Major I., Molnár M., Nadachoswki, A., Nemergut A., Svoboda, J., Verpoorte, A., Wojtal P., Wilczyński, J. (2021). The Epigravettian chronology and the human population of Eastern Central Europe during MIS2. *Quaternary Science Reviews,* 271, p. 107187. https://doi.org/10.1016/j.quascirev.2021.107187

Markó, A., Gasparik, M. (2018). Orrszarvúborda csokoládékovával. *Élet és Tudomány,* 73(2), pp. 47–49.

Nemergut, A., Cheben M., Gregor, M. (2012). Lithic raw material use at the Palaeoltihic site of Moravany nad Váhom-dlhá. *Anthropologie,* 50(4), pp. 379–390.

Neugebauer-Maresch, C., Einwögerer, T., Richter, T., Maier, A., Hussain S. T. (2016). Kammern-Grubgraben. Neue Erkenntnisse zu den Grabungen 1985–1994. *Archaeologia Austriaca,* 100, pp. 225–254. https://doi.org/10.1553/archaeologia100s225

Přichystal, A. (2010). Classification of lithic raw materials used for prehistoric chipped artefacts in general and siliceous sediments (silicites) in particular: the Czech proposal. *Archeometriai Műhely,* 7(3), pp. 177–181.

Reimer, P. J., Austin, W. E.N., Bard, E., Bayliss, A., Blackwell, P. G., Bronk Ramsey, C., Butzin, M., Cheng, H., Edwards, L. R., Friedrich, M., Grootes, P. M., Guilderson, T. P., Hajdas, I., Heaton, T. J., Hogg, A. G., Hughen, K. A., Kromer, B., Manning, S. W., Muscheler, R., Palmer, J. G., Pearson, C., van der Plicht, J., Reimer, R. W., Richards, D. A., Scott, M. E., Southon, J. R., Turney, C. S.M., Wacker, L., Adolphi, F., Büntgen, U., Capano, M., Fahrni, S. M., Foghtmann-Schulz, Aleandra–Friedrich, Ronny–Köhler, Peter–Kudsk, Sabrina–Miyake, Fusa–Olsen, Jesper–Reinig, F., Sakamoto, M., Sookdeo, A., Talamo, S. (2020). The IntCal20 Northern Hemisphere Radiocarbon Age Calibration Curve (0 – 55 cal kBP). *Radiocarbon,* 62(4), pp. 725–757. https://doi.org/10.1017/RDC.2020.41

Svoboda, J., Novák, M. (2004). Eastern Central Europe after the Upper Pleniglacial: Changing points of observation. *Archaologisches Korrespondenzblatt,* 34(4), pp. 463–477.

Szekszárdi A., Szakmány Gy., T. Biró K. (2010). Tokaji-hegységi limnokvarcit-limnoopalit nyersanyagok és pattintott kőeszközök archeometriai vizsgálata I.: Földtani viszonyok, petrográfia. *Archeometriai Műhely,* 7(1), pp. 1–17.

Tóth, Z. H. (2011). Újabb adalék a szeletai üveges kvarcporfír előfordulásához: Bükkszentlászló, Hideg-víz. *Gesta,* 10, pp. 147–149.

Vértes L., Tóth L. (1963). Der Gebrauch des glasigen Quarzporphyrs im Paläolithikum des Bükk-Gebirges. *Acta Archaeologica Hungarica,* 15, pp. 1–10.

Vértes L. (1965). *Az őskőkor és az átmeneti kőkor emlékei Magyarországon*. A Magyar Régészet Kézikönye I. Budapest: Akadémiai Kiadó.

Wilczyński J., Goslar, T., Wojtal, P., Oliva, M., Göhlich, U.B., Antl-Weiser, W., Šida, P., Verpoorte, A., Lengyel, Gy. (2020). New radiocarbon dates for the Late Gravettian in Eastern Central Europe. *Radiocarbon,* 62(1), pp. 243–259. https://doi.org/10.1017/RDC.2019.111