

KONGEMOSE FLINT TECHNOLOGY IN THE EAST BALTIC AREA. SOME EXAMPLES FROM LITHUANIAN STONE AGE SITES

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Abstract

This article presents data on Kongemose culture material which has been found in Lithuania but not yet studied. Based on material from west, east and south Lithuania Stone Age settlements, the aim is to acknowledge the existence of this culture's technology during the Atlantic period in the east Baltic region. The use-wear method was also used for a more detailed analysis. The results of the article contain versions of the emergence and development of rhombus-shaped arrowhead technology in the east Baltic during the Stone Age period.

Key words: Kongemose and Nemunas cultures, microlithic technology, Late Mesolithic-Early Neolithic, use-wear, Lithuania.

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Introduction

One of the most characteristic features that distinguish the Mesolithic period in the east Baltic region is microliths. These are small, mostly (but not only) made of flint, and represent geometric-shaped articles, usually used for composite tools. Use-wear and experimental studies confirm that these tools were most often used in hunting (Fischer et al. 1984; Fischer 1989; Lammers-Keijsers et al. 2014; O'Driscoll, Thompson 2014; Sano, Oba 2015; Skakun et al. 2014; Winiarska-Kabacińska 1993; Yaroshevich et al. 2013; Zhilin 1998). There is also data on the use of microliths for other work (Osipowicz 2014, 421; Rimkus 2016). In south and central European areas, the Russian and Ukrainian steppes, microlithic tools were already in production at the beginning of the Late Palaeolithic, and used by Aurignacian, Gravettian and Magdalenian cultures (Bordes 2006, Fig. 17; Giria, Bradley 1998; Kozłowski 2015; Movius 1968; Sinitsyn 2003). Although the first use of microliths in Lithuanian archaeological material is recorded at the end of the Late Paleolithic in Federmesser and Ahrensburgian culture finds (Šatavičius 2005, 59), the real beginning of microlithisation is considered to be the pre-Boreal period. So far, in the absence of a solid chronology of the Mesolithic in Lithuania, these two moments, the beginning of the Holocene and microlithic products, are among the main criteria in Lithuania for identifying the beginning of the Mesolithic (Girininkas 2009, 76; Ostrauskas 1998).

According to the archaeological material, quite a contrasting cultural situation is observed in Lithuania during the Mesolithic. At the beginning of the pre-Boreal, Swiderian culture technology still existed, but Kunda

(Pulli) culture, related to it, appears alongside (Sulgostowska 1999, 87), which already has microlithic implements and the blade pressure technique from one-platform cores. In the pre-Boreal and Boreal transition, archaeological material increases in the number of different types of microliths, which are treated differently by archaeologists in this region. There are versions of Maglemose, Kudlayevka or the still unidentified existence of post-Ahrensburgian technology in the southern part of Lithuania (Jablonskytė-Rimantienė 1966; Ostrauskas 2002a; Šatavičius 2016, 34), but due to a lack of data and well-stratified settlements, this problem remains debatable (Girininkas 2009, 92; 2011, 79). Nemunas culture is distinguished in the second half of the Mesolithic in Lithuania, whose inventory is characterised by the large use of lanceolates, microburin and handle core technology, and the emergence of various other geometrically shaped microliths and trapezoid arrowheads. It is important to note that there are no large differences in flint material when analysing Early Neolithic settlements and comparing them with the Late Mesolithic. The continuation of the use of the same products, including microliths, is largely evident.

Only recently, when the author of this article began to study the production technique and the use of microliths in northern Europe, did some similarities with southern Scandinavia's Middle Mesolithic (according to the established Mesolithic chronology in Denmark and Sweden) Kongemose culture emerge in Lithuania. In particular, attention was paid to the types of rhombic points that are typical of this culture. Their existence was discovered in seven places. They are located in different regions of Lithuania, so it is worth considering that the phenomenon was much wider in context.

I

STONE AGE
IN NORTHERN
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Fig. 1. Map showing the locations of sites mentioned in the text: 1–3 Daktariškė 5, Dreniai and Spiginas grave 1; 4–5 Kretuonas 1C and Pakretuonė 4; 6 Gribaša 4; 7 Katra 1 (compiled by Tomas Rimkus).

The existence of Kongemose technology also confirms the handle cores which were used for blade pressure technique. In northern Europe, these are the main criteria that distinguish Kongemose culture sites (Blankholm 2008, 112; Larsson 1980, 20).

Material and methods

For this research, archaeological material was used from the following sites: Daktariškė 5, Dreniai, Spiginas grave 1 (Telšiai district), Katra 1, Gribaša 4 (Varėna district), Kretuonas 1C, and Pakretuonė 4 (Švenčioniai district) (Fig. 1). In total, 12 rhomboid-shape arrowheads were identified that are characteristic

of the technology of Kongemose culture. The archaeological excavations and material from these sites have been published several times (Butrimas 1989, Fig. 2; 1990; 1992; 1998, 122-123; 2012, Fig. 78; 2016a, 86-95; Česnys, Butrimas 2009, 3; Girininkas 1990; 2008; Grinevičiūtė, Ostrauskas 2000; Grinevičiūtė 2002; Ostrauskas 1996, 204).

The use-wear method in this study was adapted for the functional analysis of rhomboid points. This research was carried out at the University of Klaipėda, in the laboratory of experimental archaeology and use-wear. An Olympus SZX16 stereoscopic microscope with an attached Olympus DP72 camera was used for the research. With this microscope, the image of an object

can be increased from seven to 690 times. Pictures of captured traces were processed by Image-pro Express 6.3 software.

The sites

The **Daktariškė 5** settlement (Telšiai district, west Lithuania) was found in 1986, and excavated in the 1987–1990 seasons (Butrimas 2016b, 22). The excavations revealed numerous Neolithic amber, flint, bone, antler and pottery artefacts. Two rhombic points characteristic of Kongemose culture were found in the cultural layer of the settlement (Fig. 2. 1, 2). According to radiocarbon data, the beginning of the Daktariškė 5 settlement should be dated to the Early Neolithic: 4468–4246 cal BC and 4360–4250 cal BC (Butrimas 2016b, 23). This is also confirmed by the latest excavations and AMS dating of the material (Piličiauskas et al. 2017).

The **Dreniai** Stone Age site (Telšiai district, west Lithuania) was excavated in 1993. After short excavations, it was established that the flint material is in mixed layers and cannot be considered as homogeneous (Ostrauskas et al. 1994, 27). The cultural layer was completely ruined by farming activity. However, some Pulli-type arrowheads show the early occupation of the site. The later part of the site should be related to the use of geometric microliths and one-platform conical cores. The material is not dated by radiocarbon; however, on the basis of technical and morphological flint tool features, the authors of the excavations date the site to the Mesolithic (Ostrauskas et al. 1994). One typical Kongemose technology rhombic point was found in the abundant flint inventory (Fig. 2. 3).

The **Gribaša 4** settlement (Varėna district, south Lithuania) was found in 1998, and excavated in 1999 and 2000 (Grinevičiūtė, Ostrauskas 2000). The settlement was on the shores of the former Lake Duba. Archaeological excavations revealed an abundant series of flint and pottery artefacts. The technical features of the material enabled the settlement to be fitted into a long chronology: Final Palaeolithic to Late Neolithic (Grinevičiūtė 2002, 7). Three rhombic arrowheads were found in the settlement's flint inventory (Fig. 2. 4–6).

Excavations in the **Katra 1** settlement (Varėna district, south Lithuania) were conducted in 1998 and 1999 (Girininkas 2000). The settlement is located on the right bank of the River Katra, on a sandy terrace of limnoglacial origin. Like most Stone Age settlements in the southern part of Lithuania, the Katra 1 settlement is a sandy site with mixed material, and has no clear stratigraphy. The abundant archaeological inventory, as in

the Gribaša 4 settlement, enables us to date the site to the Final Paleolithic to Early Bronze Age (Girininkas 2000, 13). One typical rhombic point of Kongemose culture has been found in this place (Fig. 2. 7).

The **Kretuonas 1C** settlement (Švenčionys district, eastern Lithuania) was intensively excavated from 1987 to 1992 (Girininkas 2012, 28). During five seasons of research, a large area of the settlement was explored, and an enormous amount of pottery, bone, antler and flint objects were collected. According to the available radiocarbon data, the settlement dates back to the very end of the Late Neolithic–Early Bronze Age (Girininkas 2009, 257). During the Stone Age, the Kretuonas Lakeland was inhabited from the final Palaeolithic; therefore, it is not surprising that Kretuonas 1C holds flint tools which were mixed from earlier habitations. Two such are rhombic arrowheads that resemble Kongemose technology (Fig. 2. 8, 9).

The **Pakretuonė 4** settlement (Švenčionys district, east Lithuania) was excavated in 1988, 1992 and 1993 (Girininkas 1990; 1994). This is another Stone Age site near Lake Kretuonas. It was dated according to the typology of tools to the Early/Late Mesolithic to Early Neolithic. Only one Kongemose point was found there (Fig. 2. 10).

Spiginas grave 1 was found in 1985–1986, during the survey of an island in Lake Biržulis called Spiginas (Telšiai district, west Lithuania) (Butrimas 1992, 4). The grave was badly damaged by digging trenches during the Second World War. From the disturbed grave, researchers were able to identify a 35 to 45-year-old male. Human bones from the grave were dated to 4355–4266 cal BC (Butrimas 2012, 71). According to the author of the excavations, two typical Kongemose points were found near the grave (Fig. 2. 11, 12).

Technology and use-wear

The author succeeded in finding in Lithuanian museums and scientific literature 12 rhombus-shaped arrowheads in total, which resemble Kongemose culture technology (Fig. 2). All of them are made from blades removed from single-platform cores, often with a bright bluish, reddish or whitish patina. The blades were knapped from light grey and whitish flint nodules, whose natural sources are found in southern and western Lithuania (Baltrūnas et al. 2007). According to the remaining bulbs on the Daktariškė 5 and Kretuonas 1C artefacts, it can be concluded that the blades were removed by pressure technique (Fig. 2. 2, 9). Usually only the middle or lower parts of blades were used for manufacturing arrowheads. One of the items from Spiginas 1 has a retouched bulb, which seems to

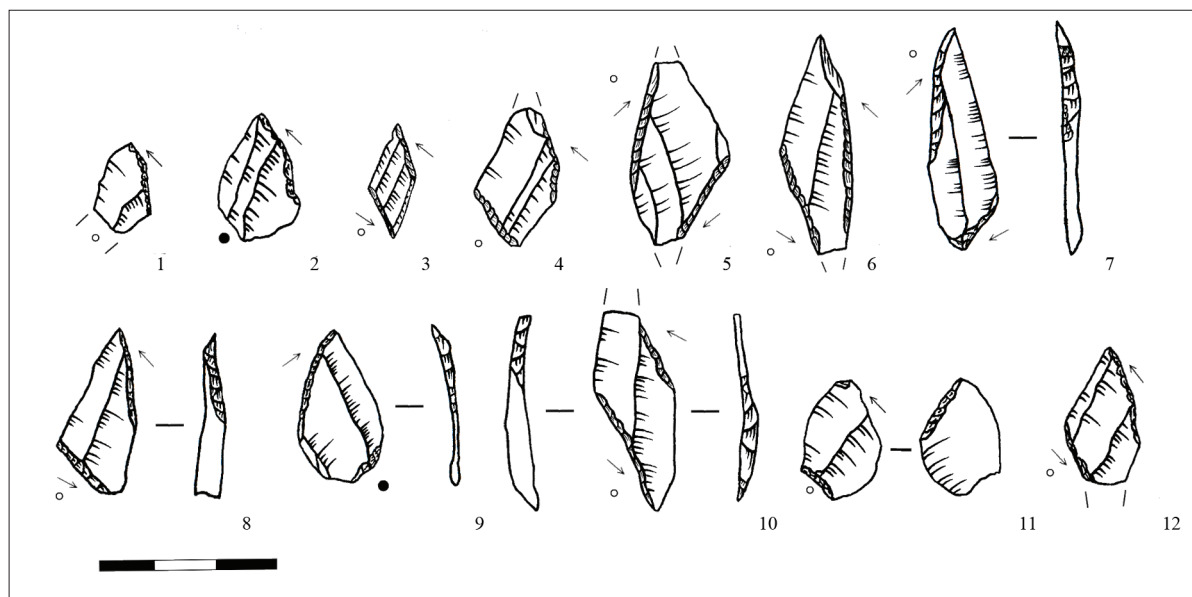


Fig. 2. Rhombus-shaped points from Lithuanian Stone Age sites: 1, 2 Daktariškė 5; 3 Dreniai; 4–6 Gribaša 4; 7 Katra 1; 8, 9 Kretuonas 1C; 10 Pakretuonė 4; 11, 12 Spiginas grave 1 (drawing by Tomas Rimkus).

have been an obstacle for hafting the arrowhead. The blades were truncated by microburin or simple breaking techniques. The latter was identified only on one of the items found in the Daktariškė 5 settlement (Fig. 2. 2). It cannot be assumed that this article is original in shape. Its proximal end could have been formed by microburin method, but this part could have just been damaged and broken after using the article. Fractures occur on the surfaces of all points as the consequence of use. This allows us to conclude that arrowhead tips formed by microburin technique are quite fragile and break quickly. On the other hand, this blade splitting method gives the much-needed sharpness for the arrowhead.

The sides of the arrowheads are additionally worked by perpendicular retouch. In most cases, microburin spalls were also retouched. Retouch was formed from the reverse to the obverse side for all products, except for the specimen found in Spiginas grave 1, which is retouched from the reverse to the obverse (Fig. 2. 11). It is no wonder that in the literature these points are treated as rhombic or oblique arrowheads, since one side of the artefact is always formed diagonally and acquires a rhombus shape (Brazaitis 1998, 94). The best examples of such shapes are from Dreniai and Spiginas grave 1.

The tips of the arrowheads were usually formed at the distal ends of the articles. Exceptions are only visible on one of the tools found in the Gribaša 4 and Katra 1 settlements. Perhaps in this particular case, we cannot detect any technical nuance. The functioning parts of the points have always been chosen as the stronger and

sharper elements of the tool. These parts were further identified using the use-wear method.

Use-wear analysis was carried out on all the rhombic arrowheads. Working traces were best obtained and captured by increasing the image of an object from 20 to 230 times. The identification of many traces was determined by the flint's raw material, its colour, and the state of preservation of the tools. For example, the analysis of one product found at Daktariškė 5 was impossible because the artefact is affected by long-burning (Fig. 2. 1). The intensity of the patina was also a negative factor. On the other hand, during the analysis, the author was able to find technical and functional traces on many articles. First of all, the use of the microburin technique by the use of microscope was confirmed, by which spalls on some tools were removed by retouch (Fig. 3). The investigation of one of the Kretuonas 1C arrowheads showed multi-direction microscopic striations (Fig. 4). They formed due to the shaping of the proximal end by a retouching tool. It also shows that retouch was formed by a hard material, probably antler. None of the tips of the arrowheads have linear traces formed from strong impacts with obstacles. Only one tool found in the Gribaša 4 settlement can be considered as an exception, but the origin of this trace is not entirely clear. On the other hand, traces of impact have been found in the shape of cleavages or micro-retouch. Such traces were found on almost all the studied points (Fig. 5). Stronger cleavages could have been formed from impact with hard animal tissue (e.g. bone) or missing a target. As a result, the arrowhead could have struck a natural obstacle. The finer traces of micro-retouch probably formed from



Fig. 3. Microburin spall on one of the rhombic points from Spiginas grave 1. Magnification 12.5x (photograph by Tomas Rimkus).

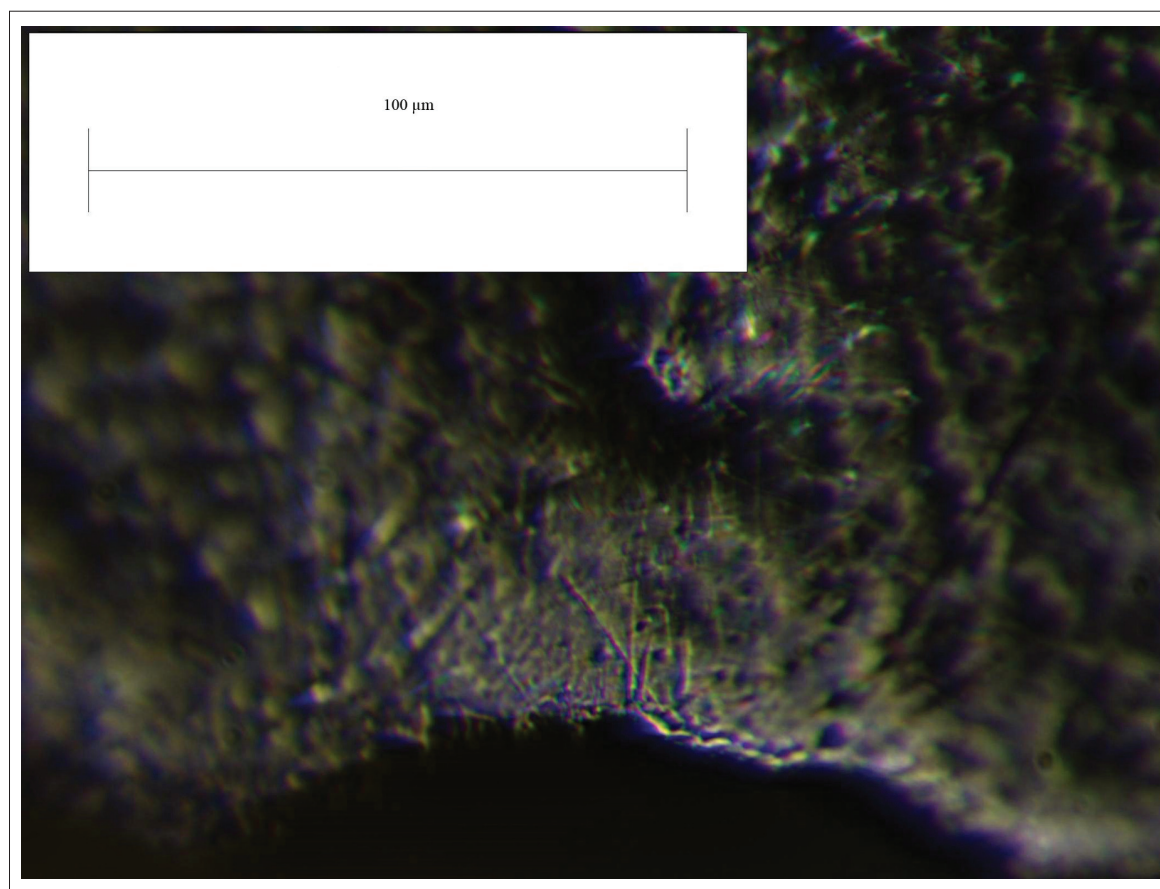


Fig. 4. Striations caused by retoucher in the proximal part of Kretuonas 1C rhombic point. Magnification 230x (photograph by Tomas Rimkus).



Fig. 5. Use-wear traces from contact with hard material. Arrowhead from Spiginas grave 1. Magnification 16x (photograph by Tomas Rimkus).



Fig. 6. Use-wear traces similar to knives on the edge of the Dreniai rhombic point. Magnification 32x (photograph by Tomas Rimkus).

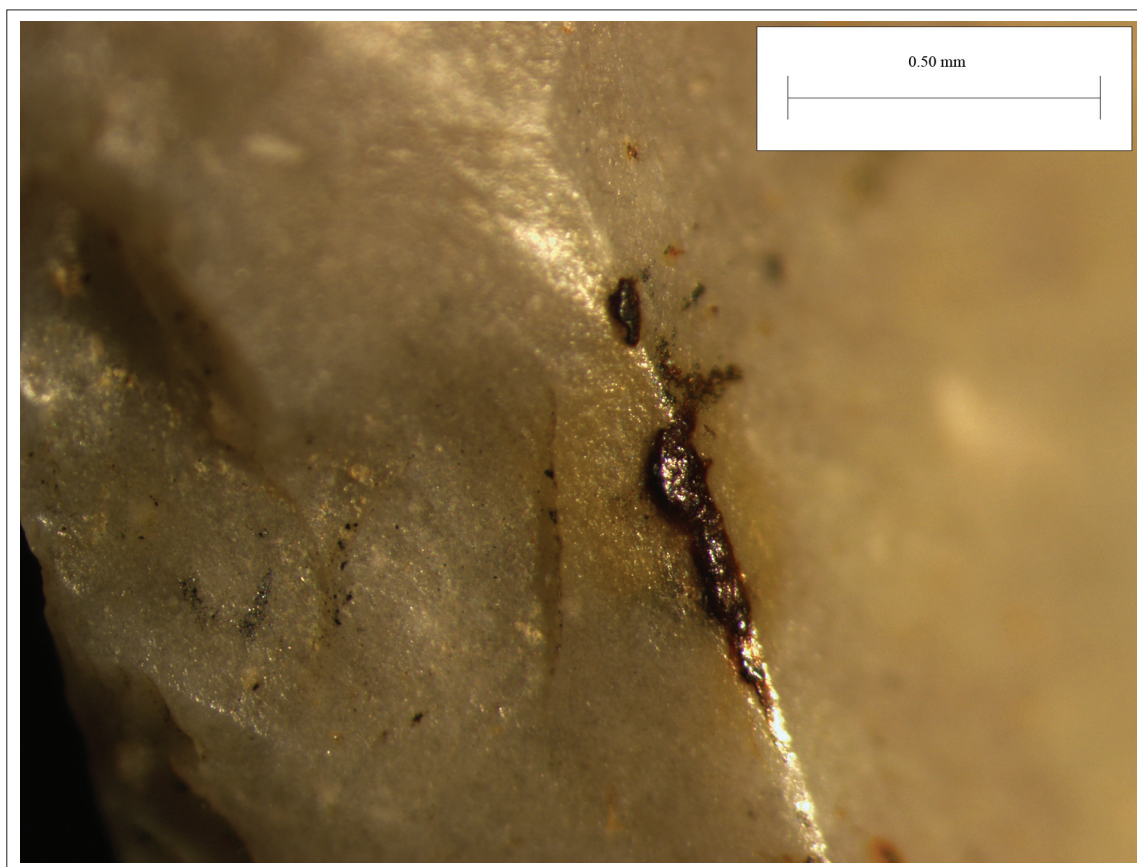


Fig. 7. Pitch residue in the proximal part on one of the points from the Gribaša 4 settlement. Magnification 25x (photograph by Tomas Rimkus).

long-term use and constant contact with animal skin and meat.

In the study of the edges of the obverse and reverse sides, traces of soft material cutting were found. These are often finely 'toothed' traces that have shiny polished features (Fig. 6). They should not immediately be considered as signs of knives. Such deformation of edges arose from constant contact with the game meat. The persistent insertion and removal of an arrowhead from the animal's body formed such 'cutting' traces. It has been experimentally proven that it takes only a few trials for them to appear (Rimkus 2016, 39). Other use-wear traces are related to the technique of hafting the articles into the arrow shafts. Obviously, these microliths were one of the components of the composite tools; therefore, they are supposed to have at least the slightest marks of hafting. They were most commonly found in the proximal parts of the articles and in retouched places. The remains of the hafting was indicated mostly by residues of pitch. It has been found in almost all the lower parts of the products, and in retouched places where the pitch residue is best preserved (Fig. 7). However, only individual laboratory tests can determine the composition of this material (Ulozaitė 2013). In addition to the signs associated

with the hafting, polished areas were found in the proximal parts of the articles. Some polished areas are of rather uncertain origin. They can apparently be associated with post-depositional factors, or the storage of articles in one place. Microlithic products had the advantage of small size; therefore, they could be manufactured quite quickly, and it was possible to carry dozens of specimens and immediately replace a worn article with a new one if necessary. On the surfaces of the Gribaša 4 and Katra 1 arrowheads, particular polished areas may also be associated with the transport of articles in a leather bag along with other similar products (Fig. 8). This hypothesis has yet to be confirmed by additional research; however, quite similar traces have been recorded in other studies by other use-wear specialists (Pyżewicz, Gruzdź 2014). All the technical, morphological and use-wear traces prove that these typical artefacts of Kongemose culture had a definite function as arrowheads.

Discussion

The first Mesolithic settlements were found in southern Scandinavia in the 19th century. At that time, finds currently known as Kongemose culture did not bear

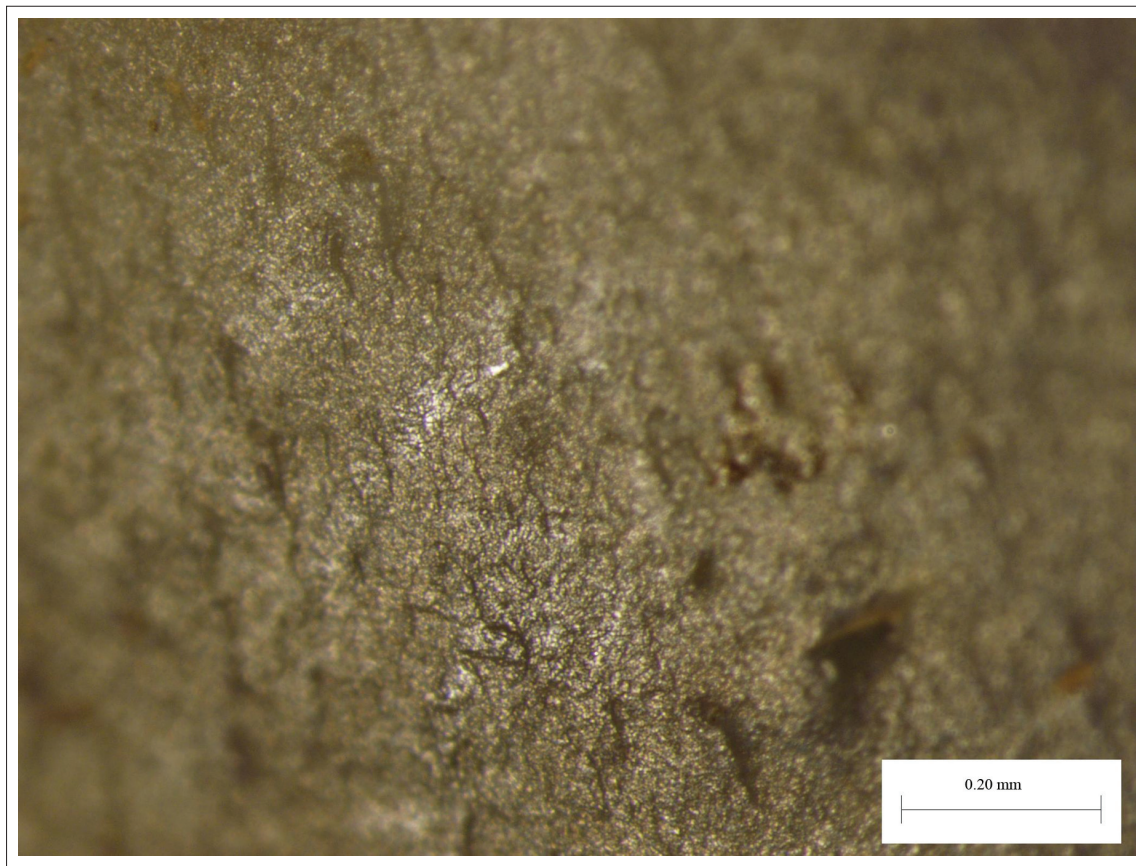


Fig. 8. Post-depositional or possible traces of transport? The rhombic point from the Katra 1 settlement. Magnification 40x (photograph by Tomas Rimkus).

this term. The term Kongemose culture in the archaeology of northern Europe started to be used only from the middle of the 20th century (Brøndsted 1957). The term was applied to a culture which was characterised by handle cores, rhombus and trapezoid arrowpoints (Ballin 2016). Kongemose culture was divided into even more detailed chronological stages on the basis of the chronology and technology of settlements excavated in Zealand (Brinch Petersen 1973). Peter Vang Petersen (1984) identified two phases: Villingebæk and Vedbæk. For the first, rhombus-shaped arrowheads are typical, and in the second stage transverse arrowheads with trapezoid features are distinguished. Later, the earliest stage of Kongemose culture was identified: the Blak phase (Sørensen 1996; 2017, 41). This stage is characterised by the first trapezoid arrowheads. Based on the number of radiocarbon dates and the latest data, Kongemose culture currently fits into the 6550–5400 cal BC period, in southern Scandinavia's Middle Mesolithic period (Larsson 2017b, 19; Sørensen 2017, 36). Later, Kongemose technology arrowheads were gradually changed by the broad trapezes of Ertebølle culture. This concept is characteristic not only in Denmark, but also in the Mesolithic settlements of southern Sweden and northern Germany (Larsson 1990).

Finds of Kongemose culture technology in Lithuania were found in seven Stone Age sites, one of them is also a grave. Geographically, all these places were found in different regions in Lithuania: the west, the south and the east. The lack of radiocarbon data at present does not allow us to make wider conclusions and put these artefacts into chronological frames. Based on the division of Kongemose culture, all these rhombus-shaped arrowheads should belong to the Villingebæk phase (6150–5700 cal BC). At present, radiocarbon dates are available only from two places under consideration: Daktariškė 5 and Spiginas grave 1. In the Daktariškė 5 settlement, the earliest dates go back to almost 4500 cal BC, while Spiginas grave 1 dates back to 4355–4266 cal BC (Butrimas 2016a; 2012; Piličiauskas et al. 2017). At that time in southern Scandinavia, Kongemose culture had already been replaced by the first ceramic communities of Ertebølle culture for several hundred years. It is difficult to evaluate and connect the available dates with these arrowheads. It is very likely that these dates do not reflect the actual chronology of the rhombus-shaped artefacts. The archaeological material in the settlements of Daktariškė 5, Dreniai, Gribaša 4, Katra 1 and Pakretuonė 4 are mixed, and have quite a widely spread chronology, while the Spiginas grave was damaged in the Second

World War; therefore, these tools were not necessarily placed as grave goods. According to radiocarbon records, the Kretuonas 1C settlement dates back to the end of the Late Neolithic and Early Bronze Age, but it is obvious that this place had been inhabited in much earlier times. At present, the lack of radiological and archaeological data does not allow us to provide solid conclusions about the emergence of these artefacts in the eastern part of the Baltic region. On the other hand, the technology of the Villingebæk phase arrowheads in this area could have been adopted much later, although trapezoid points have apparently been known here since the beginning of the Atlantic period. In the fifth millennium BC, Nemunas culture technology is found in Lithuania, of which the microlithic inventory is almost identical to other Late Mesolithic cultures of the Baltic region (Kozłowski, Kozłowski 1975). It is possible that in the second half of the Atlantic, members of this culture were able to adopt the technology of rhombus-shaped arrowheads; however, it is also possible that it developed naturally from lanceolate points. This partly explains the possible late chronology of these products in the eastern part of the Baltic region. The region also contains the commonly used Kongemose culture handle-core technique (Jablonskytė-Rimantienė 1966; Ostrauskas 2002b). This only confirms the use of very similar and sometimes identical flint technology between the Mesolithic and the Early Neolithic technologies of the western and eastern parts of the Baltic Sea.

All technical aspects and use-wear data confirm these tools as being typical of Kongemose culture. It cannot be argued that this culture existed in Lithuania during the Atlantic period. This still has to be confirmed by more data. In the past, it was believed that this culture existed exclusively in southern Scandinavia, but in recent times great studies have been conducted to prove its existence in northern Germany (Hartz 1985). It is likely that it, or at least its technology, could also have existed in other parts of the Baltic region. The author of this article would suggest that the rhombus-shaped arrowheads found in Lithuania should only be attributed to Kongemose culture technology. There is currently still a great lack of data to prove the existence of the culture itself. Due to changes in water levels in prehistory, most Kongemose culture settlements are now found submerged in southern Scandinavian sea waters (Larsson 2017a). Current underwater surveys in the Baltic Sea by Lithuanian archaeologists hold much promise to discover the first submerged Mesolithic settlements, which may provide data that is not yet found elsewhere (Žulkus, Girininkas 2014).

Conclusions

Material from Mesolithic settlements collected over several decades in Lithuania shows that there are rhombus-shaped arrowheads that are typical of Kongemose culture technology. Technical, morphological and use-wear analysis proved that they are homogeneous with Villingebæk phase arrowpoints. The lack of radiocarbon data does not allow us to make more conclusions about the chronology of these items. Radiocarbon dates from Daktariškė 5 and Spiginas grave 1 do not seem to show the true ages of the articles, and should be treated with caution. It might be assumed that during the Atlantic period, Nemunas culture communities managed to take over or develop naturally the technique of arrowheads of such a type.

The Mesolithic in Lithuania is still very poorly studied. There is still a strong lack of chronology and dated organic archaeological material. It is very likely that in the future, new archaeological research on Mesolithic settlements will provide new material associated with Kongemose culture technology. The same can be said about the storerooms of Lithuanian museums, which contain extremely important data, although it needs to be rediscovered.

Abbreviations

ATL – Archaeological investigations in Lithuania

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KONGEMOZĖS KULTŪROS TITNAGO TECHNOLOGIJA RYTŲ BALTIJOS REGIONE. KELETAS PAVYZDŽIŲ IŠ LIETUVOS AKMENS AMŽIAUS GYVENVIEČIŲ

TOMAS RIMKUS

Santrauka

Straipsnyje pateikiami duomenys apie Lietuvoje dar daugiau nenagrinėtą reiškinį – Kongemozės kultūrą. Išanalizuota 12 rombinių strėlių antgalių iš Dakariškės 5, Drenių, Gribašos 4, Katros 1, Kretuono 1C ir Pakretuonės 4 akmens amžiaus gyvenviečių bei Spigino 1 kapo (1 pav.). Rasti antgaliai technologiškai visiškai atitinka Pietų Skandinavijoje viduriniu mezolitu datuojamo Kongemozės kultūros *Villingsbæk* etapo dirbinius (2 pav.). Trasologiniai tyrimai rodo, kad antgaliai buvo intensyviai naudojami, ir patvirtina jų, kaip medžioklės įrankių, paskirtį. Ant jų smailių randama mikroretušo ir stambesnių išskilimų, kurie rodo, kad dirbiniai kontaktavo su kliūtimis (3–6 pav.). Proksimaliuose jų galuose ir retušo vietose aptikta įtvėrimo pėdsakų – apsišlifavusių plotų ir dervos liekanų (7, 8 pav.). Kol kas per mažą duomenų konkrečioms išvadoms dėl šių dirbinių chronologijos pateikti. Autoriaus teigimu, dirbiniai galėjo būti naudoti atlančio laikotarpiu, o jų technologija buvo perimta arba natūraliai išvystyta Nemuno kultūros atstovų.