L I E T U V O S

ARCHEO*logija* 50

Lietuvos istorijos institutas

L I E T U V O S

ARCHEO*logija* 50

LIETUVOS
ISTORIJOS
INSTITUTAS

VILNIUS 2024

Leidybą finansavo
LIETUVOS MOKSLO TARYBA
PAGAL VALSTYBINĘ LITUANISTINIŲ TYRIMŲ IR SKLAIDOS 2016–2024 METŲ PROGRAMĄ
(Finansavimo sutarties numeris S-LIP-22-44)

Redakcijos adresas / Editorial Board address:
Lietuvos istorijos institutas, Archeologijos skyrius
Tilto g. 17, LT-01101 Vilnius
Tel. (+370) 5 2614436, fax (+370) 5 2611433
e-mail: lietuvosarcheologija@gmail.com;
civilytea@gmail.com

Žurnalas registruotas: EBSCO Publishing: Central and Eastern European Academic Source European Reference Index for the Humanities and Social Sciences (ERIH PLUS)

ISSN 0207-8694

TURINYS / CONTENT

DISKUSIJOS / DEBATES

KITAIP APIE ARCHEOLOGIJĄ / ALTERNATIVE PERCEPTIONS OF ARCHAEOLOGY

IN MEMORIAM

LIETUVOS ARCHEOLOGIJA. 2024. T. 50, p. 27–67. ISSN 0207-8694
https://doi.org/10.33918/25386514-050004

FROM INSIDE AND OUTSIDE: CONTEXTUAL, MACROSCOPIC AND MICROSCOPIC ANALYSIS OF BRONZE AND PRE-ROMAN IRON AGE BURIAL POTTERY FROM THE EASTERN BALTIC

VANDA HAFERBERGA[1*], JOAKIM WEHLIN[2], UWE SPERLING[3]

[1] University of Latvia Faculty of Humanities, Department of History and Archaeology, Aspazija blv. 5, Riga, LV-1050, Latvia
[2] Uppsala University, Department of Archaeology, Ancient History and Conservation, Engelska parken, Thunbergsvägen 3H, Sweden
[3] Rostock University, Heinrich Schliemann-Institute of Ancient Studies, Schwaansche Str. 3, 18055 Rostock, Germany
* Corresponding author: vanda.haferberga@lu.lv

The article is devoted to the traditions and technological aspects of Bronze Age and Pre-Roman Iron Age burial pottery in the eastern Baltic. Three types of cemeteries were investigated – flat cemeteries, barrows and stone ship settings. In total, pottery from 13 cemeteries was analysed macroscopically, microscopically and in context.

The results of the study show that funerary pottery had different meanings – urns, grave goods, and probably part of a general funerary rite not associated with specific graves. Urn burials followed the main trends of inhumation and cremation burials and were placed in either stone structures or pits. Grave goods – cups and medium-sized pots - were found in inhumations and cremations, mainly placed in the head area of the deceased. The techno-stylistics of the vessels indicate that although the clay paste recipes were similar to those used for household vessels, the funerary pottery did not follow the general trends in shape and surface treatment of household vessels.

Analogies to some funerary pottery can be traced in the Sambian peninsula and Scandinavia.

Keywords: Bronze and Pre-Roman Iron Age, burials, pottery, eastern Baltic

Straipsnis skirtas bronzos ir ikiromėniškojo geležies amžiaus laidojimo paminkluose randamos keramikos tradicijoms ir technologiniams aspektams rytinėje Baltijos jūros regiono dalyje apžvelgti. Ištirti trijų rūšių kapinynai: plokštiniai, pilkapynai ir vietovės su laivo formos akmeninėmis konstrukcijomis. Analizuojant medžiagą iš 13 kapinynų pasitelkti makroskopiniai, mikroskopiniai ir kontekstiniai tyrimai.

Gauti rezultatai rodo, kad keramika kapinynuose galėjo turėti skirtingas funkcijas – keramika galėjo būti naudojama kaip urnos, kaip įkapės arba galėjo būti dalis laidojimo ritualo, nesusieto su konkrečiomis kapavietėmis. Nustatyta, kad palaidojimai urnose sutampa su pagrindinėmis griautinių ir degintinių laidojimų tradicijomis – urnos buvo laidojamos akmeninėse struktūrose arba duobėse. Įkapės – puodeliai ir vidutinio dydžio puodynės – rastos griautiniuose ir degintiniuose kapuose, daugeliu atvejų padėtos mirusiojo galvos srityje. Rastų indų technostilistika rodo, kad nors molio masės sudėtis yra panaši į buitinių indų molio masę, tačiau keramika randama laidojimo paminkluose skiriasi nuo įprastų buitinių indų formos ir paviršiaus apdirbimo tendencijų.

Kai kurių laidojimo paminkluose rastų indų analogų aptinkama Sambijos pusiasalyje ir Skandinavijoje.

Reikšminiai žodžiai: bronzos ir ikiromėniškasis geležies amžius, kapai, keramika, Rytų Baltijos jūros regionas

INTRODUCTION

Cemeteries are powerful sources of information that provide insight into the belief systems of past societies. For this reason, eastern Baltic Bronze and Pre-Roman Iron Age cemeteries are quite well studied in terms of their typology, chronology and general tendencies (for example, Grigalavičienė 1995; Graudonis 2001; Lang 2007; Legzdiņa et al. 2020; Vasks et al. 2021; Muradian 2017, 2022, 2024).

Overall, these studies do not focus on the role of grave goods when it comes to pottery and urns used in cemeteries. This could be explained by the general lack of grave goods in the burials of this period and region, making them seem more like a reflection of the status of individuals within past societies (Ciglis et al. 2021, 259–260). However, some data from the excavations suggest a much wider meaning and use of pottery in burial rites, not always associated with the social status of the individual (for example, Ģinters 1931; Stepiņš 1943). In this respect, an analysis of the contextual tendencies and techno-stylistics of funerary pottery between different types of cemeteries would allow us to broaden our understanding of the specific tendencies and differences in the meanings of this group of artefacts in funerary rites.

In this study we examined the pottery of three specific Bronze and Pre-Roman Iron Age burial types in the eastern Baltic - barrows, flat cemeteries and stone ship settings (Graudonis 2001, 145–161; Grigalavičienė 1995, 64–88; Lang 2007, 147). The pottery comes from different funerary contexts and represents different techno-stylistics, indicating not only the diversity of its application and use in funerary rites, but also its appearance (morphology) and production technology.

Therefore, the aim of this study is to distinguish the role and techno-stylistics of funerary ceramics of the Bronze and the PRIA of the eastern Baltic. Through such a study we believe that it is possible to gain a better understanding of the role of ceramics in funerary rites and the differences in their use in different burial practices.

CHARACTERISTICS AND CHRONOLOGY OF THE SITES ANALYSED

Burial pottery from the cemeteries was analysed: eight barrow cemeteries, three stone ship settings and two flat cemeteries (Fig. 1). These sites were chosen because of the differences in funerary practices, chronology and geographical location, which made it possible to distinguish the overall development of the role and techno-stylistics of funerary ceramics in the region and during the different periods of the Bronze and PRIA. Thus, it is crucial to analyse the earliest cemeteries, even if no pottery is found within the specific burial itself, but in the overall context of the cemetery, as in the case of the Pukuļi barrow cemetery.

Each cemetery offers different types of information, depending on its type, chronology and state of research. In order to successfully interpret the role of the burial pottery and its techno-cultural aspects, the context of the sites must be examined. Brief information about each cemetery can be found in the Appendix 1.

Below is a brief overview of the sites mentioned and included in the study. The selected cemeteries cover a wide time range from 1400–1 BC, and the majority of the cemeteries yielded ^{14}C dates (with the exception of Bērzkalni, Mušiņas, and Strīķi).[1]

There are grave types that can be considered typical and widespread in the Bronze and PRIA eastern Baltic, such as the Reznes barrows. On the other hand, the ship cemeteries and the flat cemeteries

[1] All of the ^{14}C dates have been recalibrated in 2022 by using OxCal 4.4. IntCal20. OxCal 4.4. Bronk Ramsey (2021). Atmospheric data from Reimer et al. (2020).

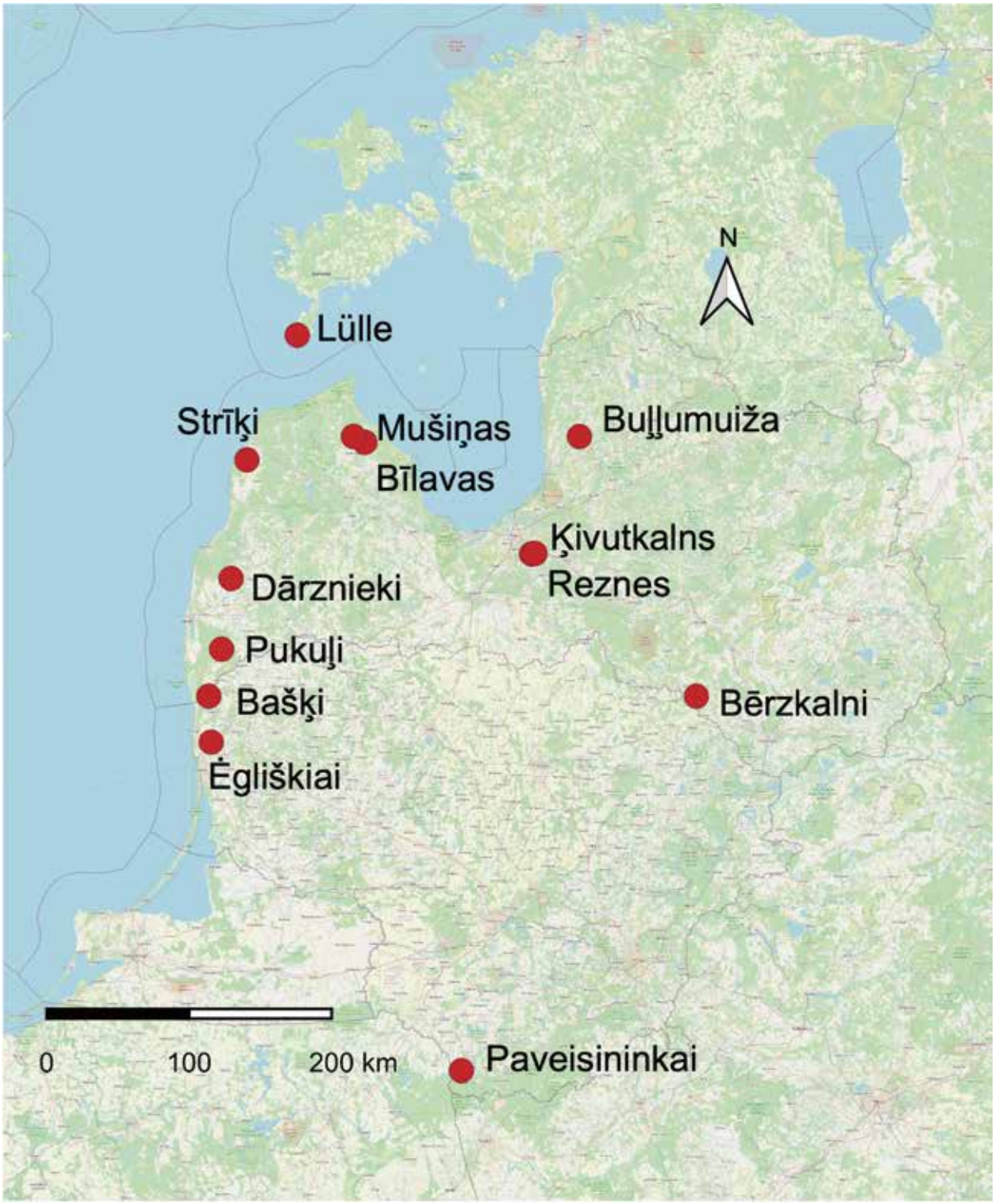

Fig. 1. Location of the cemeteries analysed in this study (created with QGIS, base: OpenStreetMap)
1 pav. Šiame tyrime analizuojamų kapinynų geografinė padėtis (sukurta naudojant QGIS, OpenStreetMap pagrindu).

on hilltops (later hillforts) are more specific, but suitable for research on funerary and domestic pottery. The sites mentioned below illustrate the individual and sometimes unique features of the burial rites of the cemeteries in question. The study also reveals the complex picture of regionally divergent grave goods and burial rites in the eastern Baltic Bronze and PRIA (see Sperling, Lang 2021). These regional and small-scale developments and formations do not allow for straightforward archaeological typo-chronological labelling or categorisation as in the case of the *Urnfield* or *Lusatian* culture groups in Central and eastern Europe. Nordic or Scandinavian influences are mainly limited to the material culture of a few settlement sites (pottery, bronze work) and ship settings in the coastal areas of present-day Estonia and Latvia.

The burials or grave goods in the eastern Baltic in the given period can be described or characterised by certain features in the construction of the burials or graves (see barrows), but hardly in terms of the funerary rites – which speaks for the occurrence of both inhumations and cremations (together) or for the peculiar inconsistency in the number and/or composition of the grave goods.

Barrows

The Pukuļi barrows are the earliest known barrows in the eastern Baltic, established during the EBA and used until the beginning of the LBA (Legzdiņa et al. 2020, 1866). Most of the barrows investigated were made of ploughed soil, with additional stone pavements at various levels, entrances and cists (Vasks 2000b, 100–101). The entrances were mainly made of stone, but in some barrows they were made of wood (ibid., 100). Their size range was from 10–15 m in diameter, but the height did not exceed 1,2 m (ibid.). The inhumations in the Pukuļi barrows have not been preserved, but the deceased were placed in stone cists or pits, or the bones were scattered on the ground in heaps. The exact number of burials is not known (Ibid., 101–102).

According to ^{14}C data, during the second half of usage of Pukuļi, Reznes barrow cemetery was established (Legzdiņa et al. 2020, 1866). The barrows created were larger than ones in Pukuļi, being 20 – 24 m in diameter and reaching height of three metres (Graudonis 1961, 19–30). Unlike the barrows in Pukuļi, Reznes barrows were made of sand (not plough soil) and stones, sometimes placed in pavement, only in one stone ring was distinguished (Graudonis 1970, 21). Just like in Pukuļi, inhumations and cremations were distinguished in Reznes, reaching total of 433 burials (Graudonis 1961, 19–30; Graudonis 1970, 21).[2] Inhumations were placed in stone cists, although cremations, just like in Pukuļi, were either in cists or on ground. Notably, some burials (inhumations and cremations) were placed above artificial layers of red clay (Graudonis 1961, 24). Ritual structures such as pits filled with red clay were also distinguished in several barrows (Graudonis 1970, 22). Secondary burials in Reznes took place from LBA until historical times (Vasks et al. 2021, 26).

According to ^{14}C dates, the Pukuļi and Reznes barrows belong to the earliest burials analysed in this study (Ciglis, Vasks 2017, 1. tabula, 53–55; Legzdiņa et al. 2020, Table 1, 1851–1853). Due to disturbances in these graves already before excavations in the 19th century, the precise original context of the burials is partially lost, and secondary interment as in Reznes barrows cannot be ruled out (Vasks 2000, 37; Vasks et al. 2021, 26). There is also the possibility of MRE in the radiocarbon-dated calcined bones, since fish was one of the main food sources during EBA–LBA (Zariņa et al. 2023).

[2] The precise number of burials found in the researched barrows is not known due to the lack of information from Anton Buchholtz excavations and partly damaged 2nd barrow (see Graudonis 1961).

During the beginning of LBA, the barrow necropolises of Buļļumuiža and Dārznieki have been established (Ciglis, Vasks 2017, 1. tabula, 54, 56–57). The Buļļumuiža cemetery consists of at least thirty barrows, whereas in Dārznieki is only one single barrow is known (Šturms 1929, 1–2; Ģinters 1930, 4–10; Graudonis 1966, 20). The latter shows typical barrow constructions made of sand and stones, with dense pavement, but without ring structure (Šturms 1944, 2). The stone cists contained inhumations without any bones preserved. There was one single cremation burial, placed in an urn (Ibid., 1–4), besides secondary burials dated to the 18th century AD (Ibid., 4). The barrows in Buļļumuiža are more diverse in structures and size, ranging from two to thirty m in diameter and heights reaching up to three metres (Vasks 2021a, 273). The barrows are made of sand and dense stone pavements, with some barrows having stone circles (Šturms 1929, 1; Ģinters 1930, 3–11; Graudonis 1966, 20). Quite exceptional among barrow cemeteries are the Buļļumuiža double barrows (Ginters 1931, 423). It has been suggested that the large barrows in Buļļumuiža contained stone cists with both inhumations and cremations and the smaller ones mainly cremations (Ibid., 428–431).

The barrow cemeteries of Bašķi and Ėgliškiai, both in distance of around 45 km, have been established more or less contemporarily. The barrow construction follows the same principles as others – made of sand and stones, rings and pavements (Stepiņš 1943, 3–5; Grigalavičienė 1979, 6–28, 1995, 66–78; Ciglis 2021, 271–272). Ėgliškiai appears to have complex burial structures, i.e. with three merged barrows, possibly erected simultaneously (Grigalavičienė 1995, 66–78; Muradian 2022, 172). The Ėgliškiai and Bašķi necropolises, eight barrows with 48 burials and three with seven burials, respectively, have each double stone rings and cremation burials in piles and cinerary urns (Grigalavičienė 1995, 67; Stepiņš 1943, 3). There are no clear indications if Bašķi had cists and inhumation burials (Ciglis 2021, 271).

Some ^{14}C dates obtained from Ėgliškiai cemetery dates fall into the Hallstatt Plateau (Muradian 2022, 172), whereas the dates from Bašķi are not affected (Ciglis, Vasks 2017, 1. tabula, 57). There are similarities within the find assemblages, although Ėgliškiai had a wider variety of finds from the PRIA (e.g. tutuli-spiral pendants; Grigalavičienė 1979, 17; Ciglis 2021, 271; Muradian 2022, 163). The barrows have a likely time-span in the middle of the PRIA, ca. 3rd–2nd centuries BC (Grigalavičienė 1979, 31–32; Ciglis 2021, 271).

The two barrow necropolises of Bērzkalni and Strīķi are broadly applicable to PRIA (500–1 BC), but based on the typo-chronology of the finds. Bērzkalni barrow (partly damaged) is made of sand and stones, in between fine clay and soil pan layers were distinguished (Šnore 1976, 4–5). The Bērzkalni barrow contains inhumations only; three of them are of PRIA date (Šnore 1977, 62–63, Vasks 1994, 76). From the Strīķi barrow cemetery (main structure unknown) there is only one burial (skeletal) certainly applicable to this period (Riekstiņš 1932a, 6; Vasks 2003, 149). Like Bērzkalni, there are no indications of cremation burials in Strīķi. The finds obtained in this burial belong to the middle – end of PRIA, ca. 200–1 BC (Balodis 1956, 76; Vasks 2003, 144).

Ship settings

There are few exceptional groups of Scandinavian stone ship graves that have been found only in coastal areas of Courland, Saaremaa and North Estonia. The Courlandic ships of Bīlavas and Mušiņas, as well as the ones from Lülle (Saaremaa) resemble some of the renowned Gotlandic counterparts in size, form and setting (Wehlin 2013; 2022). Moreover, the preserved grave goods such as pottery and bronzework add to these Nordic influences in funerary rites.

The Bīlavas and Mušiņas graves each consist of two subsequent, connected stone ships oriented in NW-SE direction (Šturms 1931, 111, 115). The stone

constructions outline the shape and size of ships, but are characteristic in their stone pavements and chambers from slab stones that contain cremated individuals either in urns or without them (Ibid., 115–116). The Courlandic ships are quite monumental in size, with Bīlavas being slightly larger than Mušiņas: 15.45 x 4.5 m and 14.95 x 3.05 m, respectively (Ibid., 116). The stone grave of Bīlavas had chambers in three levels, whereas Mušiņas had only one (Ibid., 111–116), although their size and setting resemble the Gotlandic type 1 category ships (in detail see Wehlin 2013, 58–62).

As the radiocarbon analyses from Bīlavas indicate, the burial practice in stone ship settings took place during the second half of the EBA (Wehlin 2013, Tabell 4.2., 64), thus partly overlapping with the barrow cemeteries. The Bīlavas calcined bone samples from two burials of the SE ship show a quite wide time-span between ca. 1400–1050 cal BC (3001±48 BP, Ua-42246) and ca. 980–800 cal BC (2726±39 BP, Ua-42247) (Ibid.).

Urns found in Bīlavas and Mušiņas (detailed further in the article) are similar (in shape and ornamentation) to one found in the stone ship setting of Stenkyrka 48 (type 4), Gotland, which might indicate a similar chronology. Stenkyrka 48 is dated with ca. 1200–1000 cal BC (Ibid., Tabell 4.2., 64). This could indicate that the Bīlavas[3] and Mušiņas burials have been established at the end of EBA/beginning of LBA (most likely 1100–900 BC).

The stone ship settings of Lülle at the island of Saaremaa are more likely from the advanced LBA. Similar to Bīlavas and Mušiņas, there are two (smaller) ships aligned, but oriented in NE-SW direction (Lõugas 1970, 111–112). The Lülle burials also contain two cists of limestone slabs (ship I) and a cist-like stone box (ship II), both ships densely filled with stone material. In ship I (2nd cist) a ceramic cup, bronze pincer and sheet (razor fragment?) have been found. Ship II contained the scattered fragments of a coarse striated ceramic vessel (urn container?). The stone ship size and features of Lülle are applicable to Gotlandic type 4 and in accordance to the ^{14}C-date and the artefact chronology they have been erected before or around 900 BC (Wehlin 2013, 58–62, 201, tab. 4.2., 64).

Flat cemeteries

The Ķivutkalns (present-day Latvia) and Paveisininkai (Lithuania) flat cemeteries are also included in the study. Both flat burial grounds have been established on hilltops that were used as hillfort settlements during the LBA and Roman IA (Oinonen et al. 2013; Kulikauskas 1970, 230; Vasks, Zariņa 2014, 6). Ķivutkalns contained 268 burials with inhumations and cremations either in cists or wooden coffins with ochre, sand or red clay base. In Paveisininkai, there were distinguished cremation burials only (min. 27 individuals) in cinerary urns, stone cists or piles (Kulikauskas 1970, 230; Denisova et al. 1985, 10). The Ķivutkalns burials show a great variety of single or few grave goods of bone, amber, bronze and ceramic, whereas in Paveisininkai, besides the cinerary urns, no grave goods or stray finds have been found in or around the burials (Kulikauskas 1970, 231–234; Denisova et al. 1985, 40–45).

The Ķivutkalns hillfort (fortification system, thick cultural layers and find assemblages) must have been erected and occupied quite soon after the abandonment of the necropolis, both occupation phases date within a relatively short time frame of the LBA. The find material (i.e. bone- and antler-work, pottery) from the burials and settlement is typo-chronologically diagnostic for the LBA and most of the obtained ^{14}C-dates point to the 800–400 cal BC

[3] In the account of Julius Dörings' excavations in Bīlavas in 1863, there was a *bronze dagger* that is not preserved or recorded any more (Šturms 1931, 116).

Hallstatt Plateau (Oinonen et al. 2013). However, concerning the stratigraphy and the radiocarbon dates, it has been assumed that the Ķivutkalns burial ground has been in use somewhere between 800–680 cal BC (Vasks, Zariņa 2014, 13–14).[4] The Paveisininkai burials, according to ^{14}C data, were likely used in the same period (Piličiauskas et al. 2011).

MATERIAL AND METHODS

Material

In this study, ceramic vessels and urns are being analysed in both a contextual and a technological sense. Thus, the documentation of the excavations and state of preservation of pottery itself is crucial.

Five of the cemeteries analysed were researched or partly excavated during the second half of 19th century. Therefore, in the majority of cases there is either a lack of documentation, or it is quite vague and does not give a meaningful insight of the context of the burials. Notably, no documentation can be traced on earliest excavations of Ėgliškiai, Reznes and Strīķi cemeteries. In the case of Strīķi, even the report of excavations conducted in 1930's does not contain sufficient information (Riekstiņš 1932b). Luckily, archaeologist Francis Balodis (1882–1947), a coeval of Hugo Riekstiņš (1904–1998), has given insights of burial context of this cemetery as far as possible (1956, 76–77). In turn, no information regarding the excavation in 1900 in Reznes cemetery by Anton Buchholtz has been found (Graudonis 1970, 21). The Bīlavas and Mušiņas stone ship settings are in a better situation, as relatively detailed documentation has been published (Döring 1864; Grewingk 1878).

Several cemeteries have been researched or repeatedly excavated in the late 1920's and 1930's. There is much more detailed information available regarding context and descriptions of burials, including sketches, photographs, as well as list of finds (Šturms 1929, 1933, 1935; Ģinters 1930; Stepiņš 1943). This helps us to understand the context and role of the pottery as a grave good or as a burial place. However, in some cases, the coordinates of the finds are quite vague, only indicating cardinal directions or none; occasionally the depth of the finds is added, but that is not a common practice in some documentations.

The middle – end of the 20th century was an active period for research in the cemeteries, as the majority of them were restudied as well as newly discovered and excavated. Due to the development of archaeological science, the information gathered from these excavations was well documented and also published in several articles, either as a case study or in a wider context.

Several of the cemeteries (Bērzkalni, Bīlavas, Buļļumuiža, Dārznieki, Pukuļi, Reznes) were damaged due to human activities, either by ploughing, melioration works or simply by breaking out stones (Šturms 1931, 1944; Graudonis 1961, 1966; Šnore 1977; Vasks 2000b). Thus, the full context of these sites is unknown.

Regarding the preservation of pottery, it varies depending on the cemetery. In some cases, whole vessels are preserved, for example, extraordinary preservation is seen in Paveisininkai where the majority of vessels are either slightly damaged (and has been restored) or practically whole (Kulikauskas 1970). In other cases, the majority are pottery sherds of different sizes, where it is not possible to reconstruct a whole vessel. For example, Ķivutkalns and Renzes pottery assemblages mainly consists of single sherds (Graudonis 1961; Denisova et al. 1985). Notably, some vessels of the cemeteries were not available for detailed analysis, some, e.g., Bīlavas assemblage, are lost, thus data from documentation, publications

[4] Available stable isotope data of individuals from Ķivutkalns cemetery does not indicate to an impact of MRE in data interpretation, although FRE might have influenced the dates of separate burials (Zariņa et al. 2023, 19).

or museum cartography was considered. Therefore, some information regarding typology is missing due to the differences of methods applied.

Techno-stylistic analysis

Analysis of pottery techno-stylistics include all macroscopically distinguishable features of the vessel – tempering, surface treatment, ornamentation, wall thickness, size and shape. These variables were analysed based on previous studies of Bronze Age pottery (Vasks 1991; Visocka 2022):

1) Temper. The largest grain size was measured in the clay paste of the vessel. Therefore, it is possible that smaller-sized grains were also in the clay paste of the vessel. In such case, if there were more than one grain in similar size, the largest was measured and counted in the statistics;
2) Surface treatment. The main classification of the vessels in this study is based on surface treatment to compare it with Eastern Baltic settlement pottery, which is quite uniform regarding this variable, i.e., the dominant is striated pottery, other types occur only in few cases (Vasks 1991; Grigalavičienė 1995);
3) Ornamentation. If the ornamentation was distinguished on the vessel, it was characterised by its type (pits, lines, etc.) and motif (if distinguishable) and measured if it was possible;
4) Profile forms. The classification of profile forms is quite challenging as vessels of this period are made without potters' wheel; thus, displacement is common (Orton et al. 1993, 77). However, general forms can be traced, even if they differ in some way from one another. The profile form classification is based on system created by Rimute Rimantienė (1920–2013) classification (2005, 45), with several additions (Vasks 1991, 239; Visocka 2022, 65): IC (barrel-shaped vessels); CS (slightly profiled neck); S (strongly curved neck); IK/K (biconical vessels).

To create a uniform statistical analysis, variables were recorded based on Birgitta Hulthén's methodology (1974): a) sherds from one vessel were counted as one unit; b) thickest part of the vessels wall was measured; c) height was measured only for whole and restored vessels; d) food crust and soot if distinguishable were recorded.

Ceramic petrography

In order to distinguish tempering tendencies, the quality of the clay as well as firing conditions, pottery thin sections were prepared and analysed. Samples were chosen by the following criteria: known context, distinguishable surface treatment, and wall thickness and firmness, i.e., fragile sherds were not selected. Overall, fourteen pottery thin sections from seven sites were prepared and analysed.

Thin sections were prepared according to the standard set out by Patrick S. Quinn (2013, 23–27) with a few additions (Visocka 2022, 69):

1) Sherds were cut manually with a motorised hand saw (*4000 Dremel*) in a vertical position to the vessels' rim (or its potential vertical position to rim);
2) The chosen side of the cut sample was polished by using Silicone carbide powder (abrasives: 150–800 grits) and after drying, the surface was impregnated with epoxy resin, which was previously heated in 50 ˚C on a heating plate;
3) After the resin hardened, it was polished with Silicone carbide powder and after drying, the sample was glued to the microscope slide;
4) The excess of the glued sherd was cut, leaving a 1–2 mm thick sample, which was manually grinded and polished with Silicone carbide powder to a thinness of 30 microns.

Prepared samples were analysed with polarised light microscopy (*Bresser Science MPO 401*). The micrographs were taken with a smartphone camera in a panorama setting by using an adapter to microscope. The size of the temper was measured with a ruler in ocular; however, the volume of the temper was measured from a micrograph, by putting on it a grid.[5]

POTTERY IN BURIAL CONTEXT

Pottery in the context of burials and cemeteries have various possible placements and *relationships* – either they are containers (graves) for the cremated individuals, assets (grave goods) of the deceased, or a part of the funeral rite not connected to the burial, but to the cemetery as a whole.

Before addressing the context of the funerary ceramics, one must mention that in several cases (Bašķi, Buļļumuiža, Pukuļi and Reznes) pottery sherds have been found in the filling of the barrow/s or among the outer stone constructions of the burials (Ģinters 1931, 431; Stepiņš 1943, 4; Graudonis 1961, 36–37; Vasks 2000b, 102). This could point to secondary funerary rites, post-depositional alteration or later human activities. However, due to lack of the data, this topic will not be discussed further.

Urns

The majority of the cemeteries analysed in this study contained burials in urns (Bašķi, Buļļumuiža, Dārznieki and Ėgliškiai barrows, Bīlavas, Lülle and Mušiņas stone ship settings and Paveisininkai flat cemetery).

The largest assemblage of urns is found in Paveisininkai cemetery, representing seventeen urns (Kulikauskas 1995, 27–29). However, in the literature, thirteen burials are mentioned that contained urns (Kulikauskas 1970, 232). According to the documentation, stone cist burials no. 3, 12 and 14 also contained urns, while burial no. 20 consisted of two urns. (Kulikauskas 1995, 27–29).

Regarding Ėgliškiai cemetery, in two cases, the vessels were found either in inhumation with no cremated remains in it, or in cremation burial, but without burial in it, thus, these were not counted as urns, therefore this cemetery is represented by twelve urns (Grigalavičienė 1974, 17–18, 29).

Within this study, 43 funerary ceramics can be interpreted as urns for the deceased. By their placement, urn burials can be divided into two major groups: 1) placed into pits; 2) placed in/between stone constructions. Similarly, the placement of urns was divided by Pranas Kulikauskas (1913–2004) when describing Paveisininkai burials (Kulikauskas 1970, 232). However, a more detailed description is necessary in order to distinguish overall patterns of these burials. Thus, the elements of urn burials in stone constructions were distinguished as follows: a) cist; b) box; c) placed on stone (base stone); d) stone placed on urn (stone lid); e) other stone construction (Table 1).

A total of fifteen urns were simply dug into pits. Such burials are common in all the cemeteries analysed, the only exception being the stone ship settings. The majority of urns were covered with sand or soil, although in rare cases the pit was filled up with sand mixed with charcoal or ashes. Such cases are distinguished in Ėgliškiai (barrow 3 cremation 1) and Paveisininkai (burial 20, in table "20a") cemeteries (Grigalavičienė 1974, 11–12; Kulikauskas 1970, 232). Unfortunately, detailed information of the filling of urn pits is lacking in most of the documentation and studies.

Some of the urns were dug into the filling of the barrow itself. Such case is seen in Bašķi cemetery,

[5] Such an approach was not applied in Visocka 2022, thus the data published in thesis are not as accurate and does not correspond with the reanalysed petrographic data in this study.

Table 1. Cemeteries with urn burials and their context.
1 lentelė. Kapinynai, juose rasti palaidojimai urnose ir jų aplinka.

CEMETERY	LOCATION	CONTEXT OF URN BURIALS						FINDS	NOTES	REFERENCES
		C	B	BS	SL	OSC	P			
BAŠĶI	Barrow 1, Urn I						x		In filling of barrow	Stepiņš 1943
	Barrow 1, Urn II						x		In filling of barrow	
	Barrow 1, Urn III				x?		x		Impossible to determine wether the stone was put on the urn intentionally or accidentally	
	Barrow 1, Urn IV						x		In filling of barrow	
BĪLAVAS	SE ship		x					x	Box filled with sand and soil; calcined bones with pottery sherds and bronze dagger	Šturms 1931
	NW ship					x			Chambers filled with sand, calcined bones and pottery sherds and handle	
BUĻĻUMUIŽA	Barrow 3, cist I	x								Ģinters 1930
	Barrow 4, cist II	x								
DĀRZNIEKI	Barrow 1, in the centre	x			x					Šturms 1944
ĖGLIŠKIAI	Barrow 1, cremation 3					x			Pile of stones	Danilaitė 1970; Grigalavičienė 1974, 1975
	Barrow 2, cremation 5				x	x			Construction is semi-circle-like, vessel put on ashes	
	Barrow 3, cremation 1						x		covered in grey soil	
	Barrow 3, cremation 5						x		In filling of barrow	
	Barrow 3, cremation 9, urn 1				x				Double urn burial	
	Barrow 3, cremation 9, urn 2		x	x	x					
	Barrow 5, cremation 1		x							
	Barrow 5, cremation 3		x							
	Barrow 5, cremation 4			x	x					

CEMETERY	LOCATION	CONTEXT OF URN BURIALS						FINDS	NOTES	REFERENCES
		C	B	BS	SL	OSC	P			
	Barrow 5, cremation 5		x					x	Burnt bronze fragments of unidentifiable artifact	
	Barrow 5, cremation 6			x	x					
	Barrow 5, cremation 7		x							
LÜLLE	NE ship					x			stone ring like structure	Lõugas 1970
MUŠIŅAS	SE ship, SE chamber		x	x	x				Bones from deceased were merged in both urns of SE ship, leftowers from tar and ashes were distinguished; soot/tar on the vessel	Šturms 1931
	SE ship, SW chamber		x	x	x				Urn with inv.no. 1303:I:1	
	NW ship, SE chamber		x	x	?					
	NW ship, NW chamber		x	x	?				Urn with inv.no. 1303:i-1-II:3	
PAVEISININKAI	Burial 1			x						Kulikauskas 1970, 1995
	Burial 3	x								
	Burial 4						x			
	Burial 5					x			stone ring like structure	
	Burial 7						x			
	Burial 9						x			
	Burial 11						x			
	Burial 12	x								
	Burial 13						x			
	Burial 14	x								
	Burial 15						x			
	Burial 17						x			
	Burial 19			x						
	Burial 20a						x		Burial consists of two urns next to each other; 20a - in a pit filled with charcoal	
	Burial 20b				x					
	Burial 21			x	x					
	Burial 22						x			

C – cist; B – stone box; BS – base stone; SL – stone lid; OSC – other stone construction; P – pit

where, according to documentation, urn I was dug into central area of the barrow in the depth of 25 cm from upper soil (Stepiņš 1943, 2–4). Notably, urns II and IV were distinguished in depth from 25 to 55 cm, thus also could be dug into the filling (Ibid., 4). Another such urn was found in Ėgliškiai cemetery, where it was dug in depth of 20 cm from upper soil of barrow 3 (Grigalavičienė 1974, 13).

The majority of urns (28) were placed in, on, or in-between different stone constructions. The complexity of these stone structures differs either by having one of the elements or combination of them. The most common stone structures among the rest are stone boxes – flat stones put around the urn creating box-shaped containers. These structures sometimes have additional elements – a base stone and a stone lid, fully covering the urn. The stone boxes have been distinguished in three cemeteries – Bīlavas, Ėgliškiai and Mušiņas (Šturms 1931; Grigalavičienė 1974, 1975).

In a number of cases, relatively simple stone constructions were distinguished, consisting of either a stone lid put on top of the urn, or of a base stone – or the combination of both. Those kinds of constructions occur in two cemeteries – Ėgliškiai and Paveisininkai.

Urns were also placed in cists and similar stone burial constructions (Buļļumuiža, Bīlavas, Dārznieki, Ėgliškiai, Lülle and Paveisininkai). Only in few cases, the cists and other constructions were supplemented with stone lids (Dārznieki, Ėgliškiai). According to P. Kulikauskas, in Paveisininkai urns in cists were placed either on bedrock or on base stone, although documentation is lacking on this aspect (Kulikauskas 1970, 233).

Bīlavas' stone ship setting stands out from all of the rest. Here, in the NW ship, urn/s were possibly placed within the stone chamber, as a large number of calcined bones and pottery sherds were found in them (Šturms 1931, 116–117).

In two cases, double urn burials were distinguished – Ėgliškiai and Paveisininkai. In both cases, the urns were never placed in the same manner, just the opposite, it was ensured that they are separated, i.e., in Ėgliškiai one urn was put in the stone box with base stone and lid and other only had stone lid without any other stone constructions. In Paveisininkai, one of the vessels was buried in the pit (Grigalavičienė 1974, 21–22; Kulikauskas 1970, 232).

From all the analysed cases with urns, additional grave goods have only been distinguished in two: in Bīlavas, a bronze dagger was found in a stone box together with calcined bones and shattered urn (ibid., and in Ėgliškiai there was a burnt bronze artefact together with calcined bones in the urn (Grigalavičienė 1975, 11).

Vessels as grave goods

In several cemeteries (Bērzkalni, Ėgliškiai, Ķivutkalns, Lülle, Reznes and Strīķi), ceramic containers have been placed in the course of a funerary custom. However, compared to the large number of burials, pottery and other artefacts, these appear quite rarely as grave goods. In Ķivutkalns and Reznes cemeteries, pottery sherds have been seemingly found in various probable burial contexts (Graudonis 1961; Denisova et al. 1985). However, some of these sherds in Ķivutkalns stem from post-Corded Ware vessels, and their occurrence might be accidental, due to the EBA settlement/s nearby. In the case of Reznes, the situation might be similar, but some sherds might correspond to the earliest occupation of the cemetery. In this aspect, only vessels with reliable context information are analysed as burial pottery.

Vessels in burials are found in both inhumations and cremations and the tendencies of choice and intention behind ceramic deposition will be analysed.

Inhumations with pottery have been found Bērzkalni, Buļļumuiža, Ėgliškiai, Ķivutkalns and Strīķi, reaching a total of six burials. Three burials have been found in good condition, one burial from Ėgliškiai has been damaged. The Buļļumuiža and Strīķi inhumations haven't been preserved at all. In

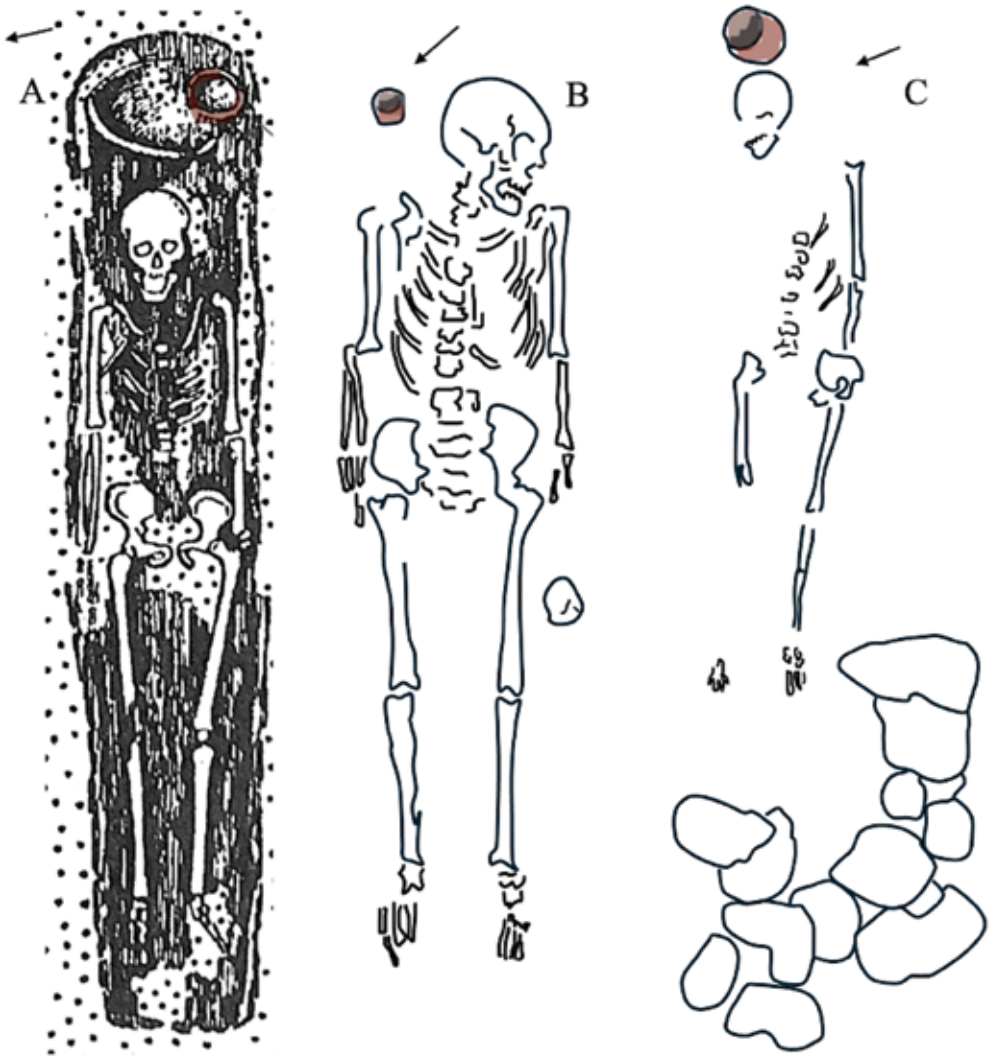

Fig. 2. Placement of vessels in inhumations (A – Ķivutkalns burial no. 204 (from: Graudonis 2001); B – C – Bērzkalni burial no. 2 and 3 (re-drawn by V. Haferberga after Šnore 1976, plan no. 3 and 4, LU AMK VIAA: 863)).
2 pav. Indų išdėstymas griautiniuose kapuose (A - Ķivutkalns kapas nr. 204 (pagal: Graudonis 2001); B - C - Bērzkalni kapai nr. 2 ir 3 (perpiešė V. Haferberga pagal Šnore 1976, planas nr. 3 ir 4, LU AMK VIAA: 863)).

all cases, the vessel has been placed in the head area of the deceased (Fig. 2). This seems to be a case of Ėgliškiai burial (inhumation no. 6 of barrow no. 3) as well, where a vessel was placed on the SE side of the skull remains (Grigalavičienė 1974, 17–18). However, in case of the one Buļļumuiža burial, it is impossible to determine the placement of the vessel. Inhumations of Bērzkalni and Ķivutkalns with vessels have probably been placed on their back, oriented in E-W or SE-NW direction (Denisova et al. 1985; Šnore 1976). In case of Buļļumuiža, Ėgliškiai and Strīķi burials, the orientation of the deceased is not clear. In two cases (Bērzkalni, burial no. 2, Strīķi burial) the vessel has been put on the right side of the deceased (Šnore 1976, 6; Graudonis 2001, 155). In Ķivutkalns (burial no. 204) it has been placed on the left side and in Bērzkalni burial no. 3, right above the head (Šnore 1976, 6–7; Denisova et al. 1985, 36).

All these burials in question have their own characteristics dividing them from each other. The Ķivutkalns inhumation, like many others in this cemetery, has a wooden coffin. The clay vessel was placed into a carved depression at the head area, containing a white substance (Fig. 2: A) (Denisova et al. 1985, 36). A bone pin was also found on the right side of the upper area of the chest (ibid.).

Another burial with vessel as well as other finds were found in Strīķi, where the skeletal remains have not been preserved. In this burial, a large stone was placed on the left side of the inhumation, presumably the head area. On the right, there was a vessel close to remains of soot and charcoal (Balodis 1956, 76–77). The deceased had a bronze neck ring with widened taurus-shaped ends around the neck, including an amber bead on the chest (ibid.).

In Buļļumuiža cist II of barrow 1, the sherds of a clay vessel were found within the burial, in addition to some bronze fragments and large lumps of charcoal (Šturms 1929, 4).

In Bērzkalni burial no. 3, a semi-circular stone structure was found in the leg area, and burial no. 2 contained a bone figurine placed in a ceramic vessel (Fig. 2: B–C) (Šnore 1976, 1977).

Lastly, there have been traces of bronze jewellery in the inhumation no 6 (barrow 3) in Ėgliškiai (green oxidation on the bones) (Grigalavičienė 1974, 17).

Cremations with vessels as grave goods have been distinguished in four cemeteries, in Buļļumuiža, Ėgliškiai, Lülle and Reznes, with up to six burials. In Buļļumuiža (burial no. 2 barrow 4) the cremation was placed in a cist, together with a textile-impressed vessel on its NW part. The burial also contained a bone artefact with perforation (Ģinters 1931, 431, 435, Tafel VIII).

In the Ėgliškiai cemetery there are two cremations (barrow 2 no. 6 and barrow 3 no. 13) with vessels as grave goods. The cremation no. 6 was distinguished in the central structure of the barrow 2, together with other burials (Grigalavičienė 1974, 8–9). A small, partly crushed clay cup was found in the same level as scattered calcined bones and two iron jewellery (?) fragments (Ibid., 9). In cremation no. 13 in barrow 3, a vessel was put between stone structures and the calcined bones of the deceased were scattered between stones and a ceramic jug (Fig. 3: A) (ibid., 29). This vessel, however, might have been a cinerary urn rather than a grave good, i.e. the find context being the result of post-depositional processes. Notably, such types of jugs have been used as urns in the south-eastern Baltic, making it quite likely to serve this very purpose (Hoffmann 2000; Muradian 2024).

In the case of the Lülle stone ship setting, some bronzes such as a lancet, tweezers and parts of a razor have been found next to a small ceramic cup in ship I, in the second stone box together with calcined bones (Lõugas 1970, 112). Although urns are quite common in stone ship settings, the cup seems more like a grave good to the deceased than an urn, especially in view of its small size.

In Reznes, a small vessel was found in the cremated burial no. 26 (barrow 2), in a cist together with cremated bones (Fig. 3: B) (Graudonis 1961, 24). No other finds were found within this burial.

Overall, it seems that pottery follows a more specific pattern in skeletal burials compared to cremation burials, i.e. when being placed in the head area. Nevertheless, one could argue that the precise position of the vessel placement is less known in cremation burials. However, other grave goods occur only in rare cases of inhumations and cremations containing ceramic vessels.

TECHNOLOGICAL ASPECTS

Clay and Temper

Petrographic analysis of pottery thin sections shows a great variety of clay paste recipes (Appendix 2). Overall, nine fabrics were distinguished among 14 thin sections. Four of these fabrics can be considered

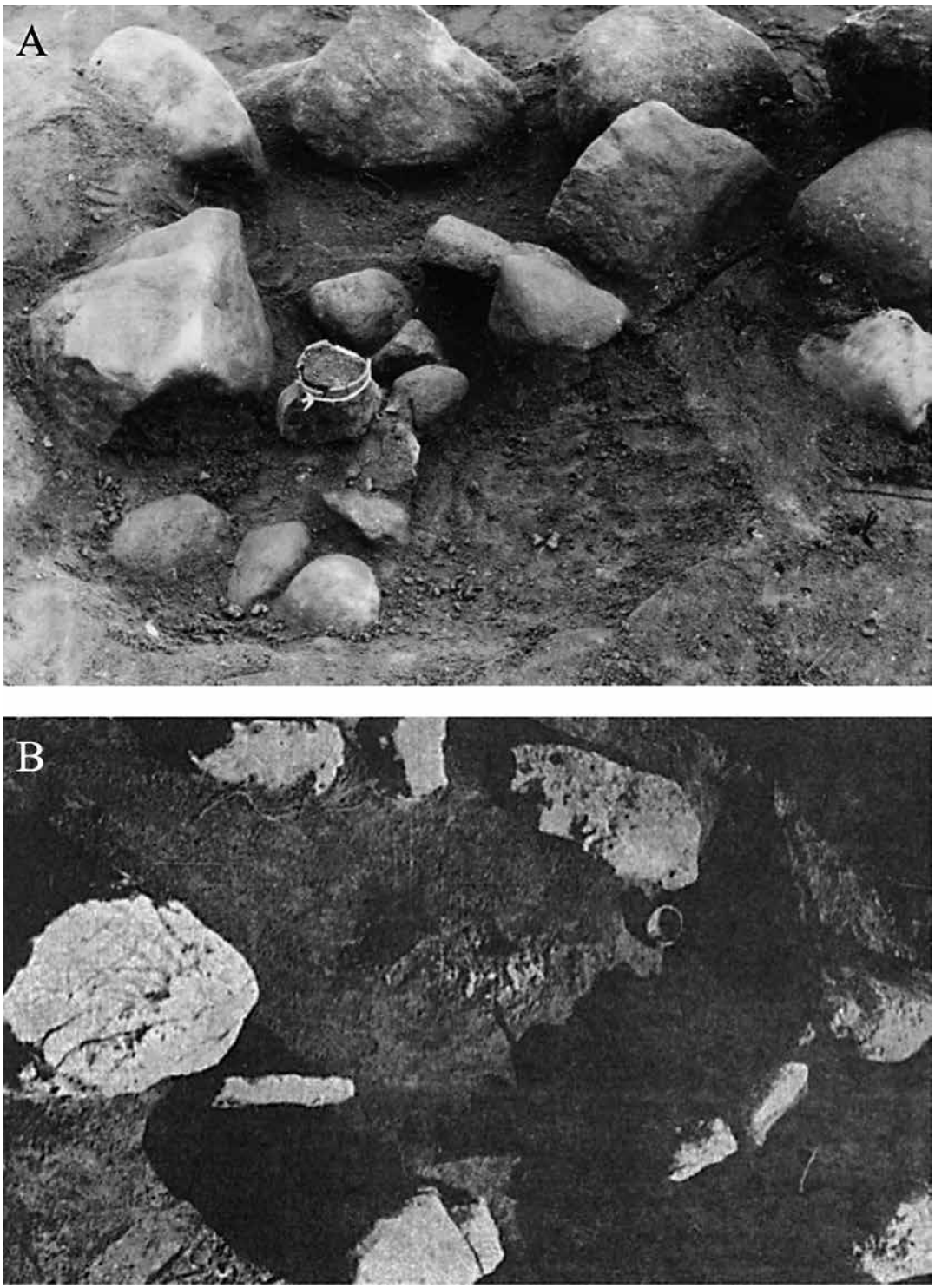

Fig. 3. Placement of vessels in cremations (A – Ėgliškiai barrow 3 cremation no. 13 (photo: E. Grigalavičienė; from: Grigalavičienė 1974, 48); B – Reznes barrow 2 burial no. 26 (*photo: E. Šturms*; from: Balodis 1956, 60)).
3 pav. Indų išdėstymas degintiniuose kapuose (A - Ėgliškių pilkapis nr. 3, degintinis kapas nr. 13 (E. Grigalavičienės nuotrauka, pagal Grigalavičienė 1974, 48); B - Reznes pilkapis nr. 2, kapas nr. 26 (*E. Šturms nuotrauk*a, pagal Balodis 1956, 60)).

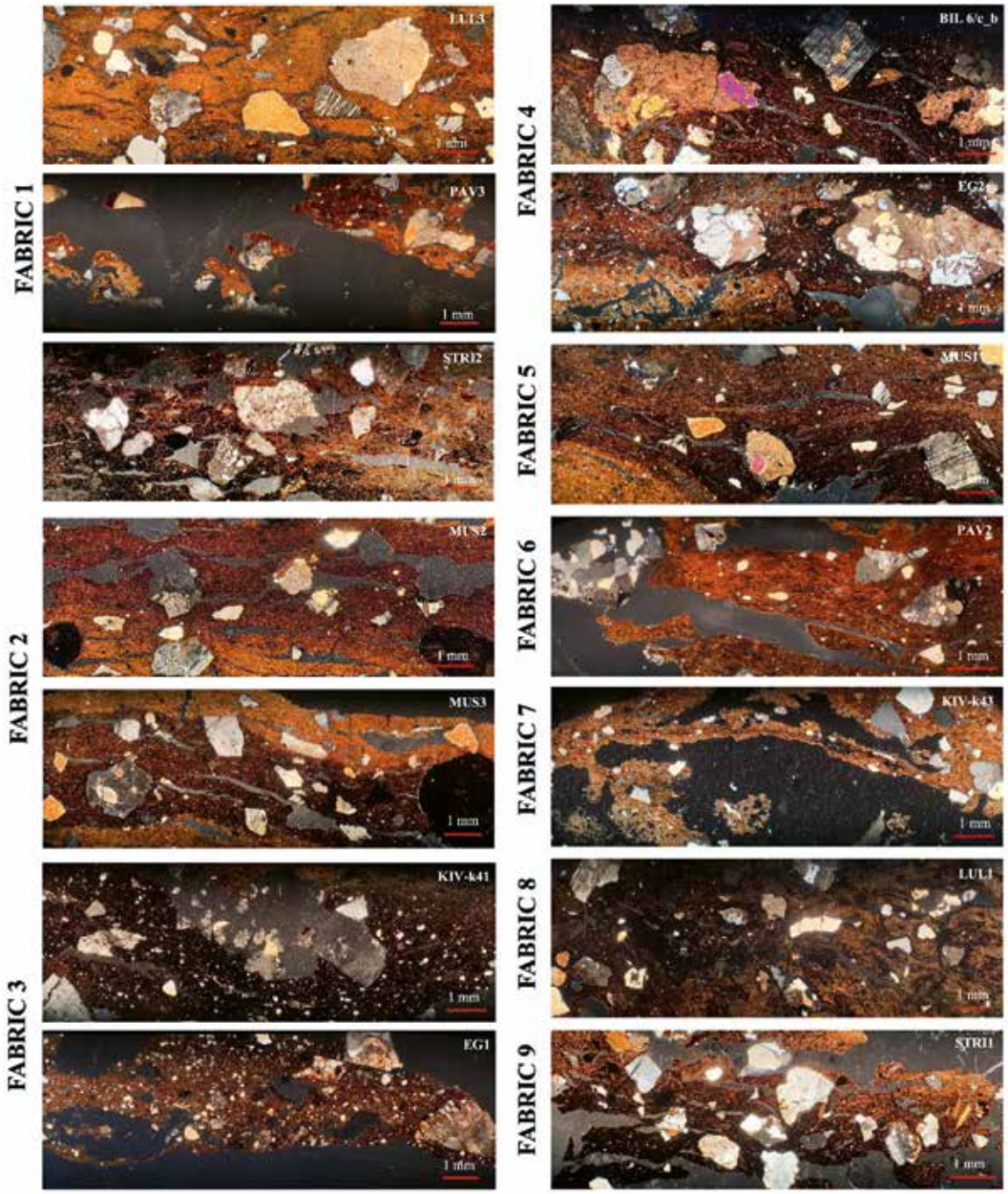

Fig. 4. Micrographs of pottery thin sections divided in fabrics distinguished within study (XPL, *author: V. Haferberga*).
4 pav. Mikrošlifų mėginiai suskirstyti pagal keramikos masės rūšis (XPL, *autorius: V. Haferberg*a).

as loners as they contain only one sample. However, the rest of the fabrics also contain a few samples each (Fig. 4).

Fabric 1 can be considered the most common as it contains three samples from Lülle, Paveisininskai and Strīķi cemeteries. All three samples are striated ware and are made of medium coarse semi-coarse – coarse clay abundant in fine sand, coarse sand, silt and mica are also common. Characteristic are iron compound concretions (described in detail later). All of these samples have been abundantly (up to 20,5% in paste) tempered with crushed medium coarse granite reaching up to 2,3 mm.

Fabric 2 consists solely of Mušiņas stone ship setting pottery, although they represent two different wares (striated and coarse-slipped). These vessels, similarly, as in the fabric 1, have been made with medium coarse clay with abundant silt and various-sized sand, rich in mica and iron compound concretions. Crushed granite has been used as a tempering material; although it has been added to clay paste in much less volume, reaching a maximum of 9,3%. Grain size of the temper is slightly finer than fabric 1. Notably, in Mušiņas thin section a separate layer has been distinguished, indicating that the vessel might be coloured.

Fabric 3 contains two samples from Ėgliškiai and Ķivutkalns cemeteries, with both having a smooth surface. Unlike the other two fabrics, these vessels have been made from coarse clay with significantly more abundant silt and various-sized sand. Crushed granite tempering has been used in similar volume as in fabric 2, although temper size is somewhat larger than the other two fabrics.

Fabric 4 also contains two samples from Bīlavas and Ėgliškiai, with each sample featuring a different surface treatment (smooth and rusticated). Just like fabric 1 and 2, it has been made with medium coarse clay, however with abundant admixture of silt and fine sand, less coarse sand. Crushed granite has been used as a temper in high volume (up to 28%), however, unlike the rest, the size of it is fairly larger, reaching up to 4,3 mm. Notable slip of the rusticated ware has also been distinguished in the thin section.

Fabrics 5 to 9 are loners as each contains just one sample, i.e., does not group with the other samples. Quite similar are fabrics 5 and 6 being made of medium coarse clay with abundant silt and fine sand grains, volume of the temper added is also the same – 11,3%. However, there is a significant difference between tempering materials used. In case of Paveisininkai, feldspar quartzite has been used as a tempering material, in turn in Mušiņas granite. Charcoal has also been distinguished in Mušiņas sample.

Fabric 7 is represented by polished vessel from Ķivutkalns. Although polished vessels are usually considered to be fine ware, in this particular case medium coarse clay with admixture of silt and fine sand has been used. Coarse sand has been used as a tempering material; however, it has been added in small amounts reaching only 3,5% in the clay paste.

Fabric 8 is represented by polished ware from Lülle. Because its composition of clay and temper significantly differs from the rest, the vessel has been made with fine sorted clay common in silt, although sand is sparse. Additionally, clay has been tampered with a mixture of sand, crushed granite and grog in volume of 12,6%. The largest grain reached up to 2,7 mm.

Lastly, Fabric 9 is one sample of smooth pottery from Strīķi cemetery. This sample follows the main tendencies of the majority of the fabrics. It is especially similar to fabric 5, however, unlike it, this sample contains iron compound concretions.

By the results of petrographic analysis, several tendencies are seen. Vast majority of samples are made of medium coarse clay with silt and various-sized sand and tempered with medium sized crushed granite. Although Bronze – PRIA household pottery is mainly made with coarse clay, medium coarse clay together with crushed granite temper are also

Fig. 5. Impurities distinguished in the clay paste of the pottery. 1 – iron compound concretions (Mušiņas, TÜ 1303:i:); 2 – food crops (Dārznieki, LNVM A 8848:4); 3 – charcoal fragment in thin section (PPL) from Mušiņas (*photos and micrograph: V. Haferberga*).
5 pav. Keramikos molio masėje išskiriamos priemaišos. 1 – geležies junginių konkrecijos (Mušiņas, TÜ 1303:i:); 2 – maistiniai augalai (Dārznieki, LNVM A 8848:4); 3 – anglies fragmentas matomas mikrošlifo mėginyje fotografuotame plokščiai poliarizuojančioje šviesoje (PPL)(Mušiņas) (*nuotraukos ir mikrofotografija: V. Haferberga*).

characteristic for the eastern Baltic region (Visocka 2022, Table 3, 97–100). In this manner, cemetery pottery follows the main tendencies of fabric types. Likewise, abundance of various-sized sand and silt in the clay paste indicates that till clay was used in pottery production.

Macroscopic evaluation of the temper was possible on 57 pottery fragments or vessels (Appendix 3). Here a larger variety is seen in temper size, reaching even 7 mm in various cases (Bīlavas, Ėgliškiai and Ķivutkalns).

Additionally, in some samples from Ėgliškiai, clay pellets were distinguished, indicating that the clay was not kneaded well enough before pottery production.

Impurities in the clay paste

In some pottery samples, impurities (accidental material) in the clay paste have been distinguished. Overall, three types of impurities can be found in the pottery samples analysed – iron compound concretions, food crops and charcoal remains (Fig. 5).

The most common impurity in the analysed samples are iron compound concretions, which have been distinguished in Ķivutkalns, Lülle, Mušiņas, Paveisininkai and Strīķi cemeteries. These ferrihydrite group lumps varied in size and colour, in some samples they were in size of less than one millimetre, however in others reached up to three mm. The shape of these lumps can be round or sub-angular while their hardness varies from fragile and crumbling (usually light reddish-brown) to level of 4,5 (dark reddish-brown) (Visocka 2022, 93). Origin of these concretions are more likely to be limonite iron ore (Ibid., 94). In the clay paste of analysed samples, only a few grains can be distinguished and their emplacement in the clay paste indicates that this material was already in the clay before adding temper, thus it is more likely to be accidental than intentional.

Charcoal has been found in two samples from Mušiņas stone ship setting. Based on the structure, the charcoal might be a leftover from wood. Unfortunately, it is impossible to distinguish the species due to the position of these impurities. It is likely that pieces of charcoal got into the clay paste during the preparation of the vessel, but this is not fully known.

Food crops in the clay paste has been found only in one pottery sample from Dārznieki cemetery (Visocka 2022, 94). In this sample, possibly four different species of imprints were distinguished in the clay paste. However, at the moment they have not

been identified yet. Food crops in the pottery fabric have been found quite frequently in the living site pottery (Ibid., 94–96). Usually, the number of crops in the clay paste is sparse, thus it is more likely that they have gotten in the clay accidentally rather than intentionally during the preparation of the vessel.

EXTERIOR

Size and shape

From all analysed vessels to 38 it was possible to determine the size, and the wall thickness was also documented for 27 of them (Appendix 3). Vessels and urns were of various sizes. Some of the pottery was miniature reaching 5,6 cm in diameter (Ėgliškiai), others were much larger, reaching even 36 cm in diameter (Paveisininkai).

Statistical data from measurements of the diameter and the wall thickness of the vessels indicates that larger vessels, just like living site pottery, had thicker walls (Fig. 6: A). Notably, there are some exceptions, where larger vessels have finer walls. One such case is seen in Ėgliškiai urn of 5th cremation from barrow 5. Generally larger vessels need thicker walls in order to gain stability, thus the result is not surprising (Visocka 2022, 106). A similar situation is seen regarding the ratio between height and size of the vessels (Fig. 6: B). Although the general trend is for larger vessels to be taller, this is not always the case. In the graph, it is seen that vessels whose diameter varies from 10–20 cm, height variation is similar. Also, non-standard cases where diameter is smaller than the height can be explained by the fact that mouth diameter of the vessel was considered, which in cases where the middle of the vessel is larger than mouth area creates such an error.

Urns are more uniform and larger in their size (12,5–36 cm in diameter) than vessels which have been used as a custom to the deceased. These household vessels also have greater variety in their size, i.e., miniature and large vessels were distinguished.

Generally, in burial pottery mostly slightly profiled and profiled (CS, S) vessels were distinguished (Fig. 6: C; Fig. 7: 1–2,7,12–17,19–20). However, individual tendencies were determined as well. Thus, in Ķivutkalns and Reznes vessels were dominantly barrel-shaped (IC) (Fig. 7: 5–6,8), in turn in Mušiņas, they were only biconical (IK) (Fig. 7: 11) urns were distinguished. Notably, non-standard shapes were also distinguished – two cups (Lülle, Ėgliškiai) and a jug (Ėgliškiai) (Fig. 7: 9–10,18).

By analysing the ratio between shape and size of the vessels, it is seen that size of CS shaped vessels varies from 6,3 cm to 36 cm, dominant being 11–17 cm. In turn, S shaped vessels were much larger, varying from 17–23 cm in diameter, only in one case, a miniature/small vessel was distinguished (Strīķi). A larger number of miniature and small vessels were istinguished in IC shaped vessels (six samples), although larger vessels up to 18 cm in diameter were also determined. IK shaped vessels were only ones where miniature vessels were not distinguished, sizes varied from 12,5–24,5 cm. Cup shaped vessels did not exceed 12 cm in diameter, in turn the upper rim of the jug was only 8,5 cm, although the diameter size of the body was larger at 18 cm (Grigalavičienė 1974, 39).

Surface treatment and ornamentation

Burial pottery represents a great variety of surface treatments – striated, smooth, coarse-slipped, rusticated, polished and textile, all of which are distinguished in the archaeological sites of Eastern Baltic EBA–PRIA.

Short clarification of classification of surface treatments is needed in order to characterise the main tendencies. Striated pottery is represented by the texture of strokes on the vessels, created while smoothing walls with such tools as twig brush, grass bundle, wooden or bone comb, etc. (Visocka 2018,

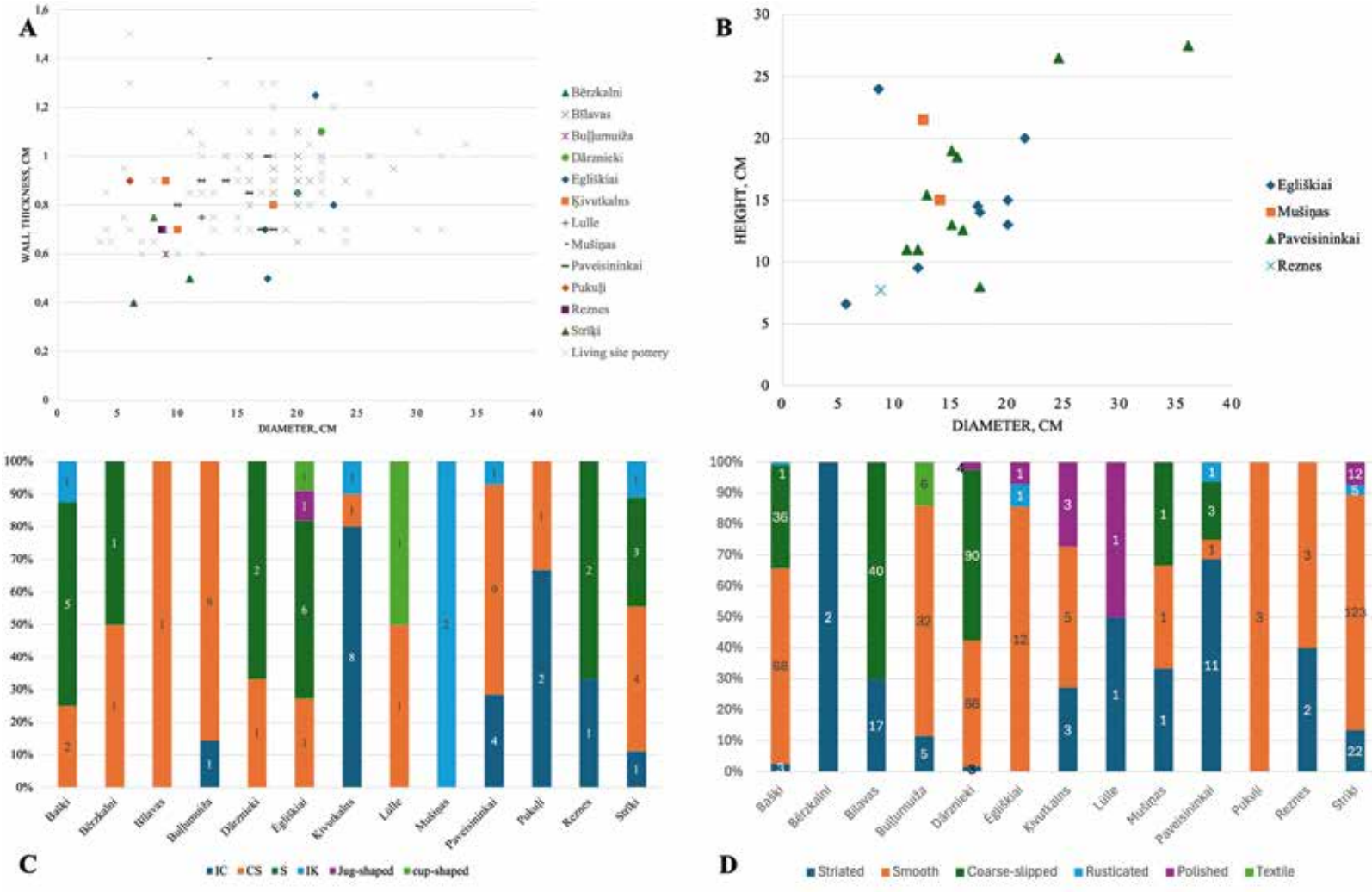

Fig. 6. Graphs of properties of the burial pottery (A – ratio between wall thickness and diameter; B – ratio between height and diameter; C – statistical data of profile forms; D – statistical data of surface treatments (besides this study, data are based on several sources: Šturms 1931; Kulikauskas 1962; Grigalavičienė 1974, 1975; Butėnienė
1985; Vasks 1991; Griciuvienė 2005).

6 pav. Kapuose rastos keramikos savybių grafikai (A – sienelių storio ir skersmens santykis; B - aukščio ir skersmens santykis; C – profilo formų statistiniai duomenys; D – paviršiaus apdirbimo statistiniai duomenys (be šio tyrimo, naudotąsi duomenimis ir iš kitų šaltinių: Šturms 1931; Kulikauskas 1962; Grigalavičienė 1974, 1975; Butėnienė 1985; Vasks 1991; Griciuvienė 2005).

Fig. 7. Selection of pottery found in cemeteries analysed in this study (1, 8 – Reznes, LNVM A 11769:11, burial no. 26, LNVM A 8378, from: Graudonis 1961; 2, 4–5 – Ķivutkalns, burial no. 32, LNVM VI 120a: 24, burial no. 70 (?), 204, LNVM VI 120a; 3 – Bīlavas, NW ship, from: Šturms 1931; 6, 19 – Bērzkalni, burial no. 2 and 3, LNVM, VI 210: 5, 7; 7 – Bašķi, LNVM A 10086: 9; 9 – Lülle, TLÜ AI 4409: 33, reconstruction: U. Sperling; 10, 16, 18 – Ėgliškiai, barrow 2, cremation no. 6, barrow 3, inhumation no. 6, cremation no. 13, drawings by: E. Grigalavičienė, from: Grigalavičienė 1974; 11 – Mušiņas, NW ship, TÜ 1303:I:1-II:3, reconstruction: V. Haferberga; 12, 20 – Buļļumuiža, barrow 4, area D, LNVM A 9961: 5, barrow 4, burial no. 2, from: Ģinters 1931; 13–15 – Paveisininkai, burials no. 20, 13, 12, LNM AR 440: 19, 14, 13, drawing by: P. Kulikauskas, from: Kulikauskas 1970; 17 – Dārznieki, LNVM A 8848: 2, 4), *photos: V. Haferberga*.

7 pav. Atrinkti keramikos pavyzdžiai iš tyrimo metu analizuotų kapinynų: 1, 8 – Reznes, LNVM A 11769:11, kapas nr. 26, LNVM A 8378, pagal Graudonis 1961; 2, 4–5 - Ķivutkalns, kapas nr. 32, LNVM VI 120a: 24, kapas nr. 70 (?), 204, LNVM VI 120a; 3 - Bīlavas, šiaurės-vakarinis laivas, pagal Šturms 1931; 6, 19 – Bērzkalni, kapai nr. 2 ir 3, LNVM, VI 210: 5, 7; 7 – Bašķi, LNVM A 10086: 9; 9 – Lülle, TLÜ AI 4409: 33, U. Sperling rekonstrukcija; 10, 16, 18 – Ėgliškiai, pilkapis nr. 2, degintinis kapas nr. 6, pilkapis nr. 3, griautinis kapas nr. 6, degintinis kapas nr. 13, E. Grigalavičienės brėžiniai, pagal Grigalavičienė 1974; 11 - Mušiņas, šiaurės-vakarinis laivas, TÜ 1303:I:1-II:3, V. Haferberga rekonstrukcija; 12, 20 – Buļļumuiža, pilkapis nr. 4, plotas D, LNVM A 9961: 5, pilkapis nr. 4, kapas nr. 2, pagal Ģinters 1931; 13–15 – Paveisininkai, kapai nr. 20, 13, 12, LNM AR 440: 19, 14, 13, P. Kulikausko brėžinys, pagal Kulikauskas 1970; 17 – Dārznieki, LNVM A 8848: 2, 4), *V. Haferberga nuotraukos*.

11–25) (Fig. 7: 11,13–15). In turn smooth pottery does not have such a texture as the previous type, although it can be either quite smooth (but not shiny) or rugged , depending on the intensity of temper (Vasks 1991) (Fig. 7: 7–10,12,16,19). Rusticated and coarse-slipped can be assumed as one type, with different variations. In both cases, after evening out walls of the vessel a layer of clay was applied. In case of rusticated pottery, clay was mixed with organics or small amount of temper (sand, rarely crushed granite), creating a vein-like texture, in turn for coarse-slipped clay was mixed with sand, crushed granite or organic material, application also differed as there are no vein-like texture (Dumpe 2021, 501) (Fig. 7: 17). Polished vessels are characterised by a very smooth, fine and sometimes even shiny surface, temper usually is very fine (Ibid.) (Fig. 7: 18). Lastly, textile pottery is characterised by imitation of textile-like impressions, created by different sizes and knotting techniques of cords wrapped around the stick (Dumpe 2006) (Fig. 7: 20).

Statistical data of surface treatment types shows that the dominant surface treatment in the majority of cemeteries is smooth pottery, especially in Bašķi, Buļļumuiža, Ėgliškiai, Pukuļi and Strīķi (Fig. 6: D). Only in Bērzkalni and Paveisininkai, striated pottery was the dominant type. In turn, coarse-slipped pottery is dominant in Bīlavas and Dārznieki, although many are found in Bašķi cemetery as well. At the same time, rusticated ware is found in small amounts in Ėgliškiai, Paveisininkai and Strīķi cemeteries. In five settlements, polished pottery has been distinguished, although only in small numbers. Buļļumuiža is the only cemetery where textile pottery has been found. In Ķivutkalns and Reznes as previously mentioned, post-Corded Ware sherds were also found, however, considering that they were most likely accidental, they were not included in the statistics.

Out of all 79 pottery sherds/vessels analysed in this study, 24 were ornamented (Appendix 3). Additionally, textile vessel from Buļļumuiža and pottery sherd from Bīlavas (not documented in detail in this study) also had ornamentation, making it up to 26 vessels (Ģinters 1931, Tafel VIII; Vasks 2000a).

In the majority of cases, (11) vessels were ornamented of different sizes of pits. Although mostly the upper part of the vessel was ornamented, in one particular case (Paveisininkai, burial no. 13) the urn was completely covered in pits (Fig. 7: 13–14,18,20). This kind of ornamentation was distinguished in Buļļumuiža, Ėgliškiai and Paveisininkai cemeteries.

A fairly common pattern (in 10 cases) was nail impressions used as an ornamentation (Fig. 7: 7,11). They can be either vertical or inclined. In the case of Bīlavas, Mušiņas and Strīķi vessels, they are placed on the shoulder area on the break or curve of them. The placement on Bašķi vessels was different as nails were impressed on upper inner and outer rim. Seemingly, this ornamentation is more characteristic to the Courland region.

In a few samples (4), line incisions were distinguished (Fig. 7: 1–2). In case of Ķivutkalns and Reznes they were vertical going down from upper part of the vessel. In turn in Pukuļi, lines were applied in vertical position. Vessel from Strīķi cemetery had line incisions on the upper rim area of the vessel.

In one sample from Strīķi, a cemetery cord impression was distinguished. By the pottery shape and fabric, it is not applicable to post-Corded Ware. However, it is questionable whether this sherd is applicable to the period of this study as well.

Quite unique for the region is a jug from Ėgliškiai cemetery (13th cremation from barrow 3) (Fig. 7: 18). The vessel was ornamented below the handle in the bottom area, with vertical and inclined lines, partly crossing each other, creating an "X" like motif separated by vertical lines and small inclined incisions. Above this motif small incisions in a wedge shape created fir needle like ornamentation. The handle is also ornamented in small incisions in a wedge shape, positioned vertically.

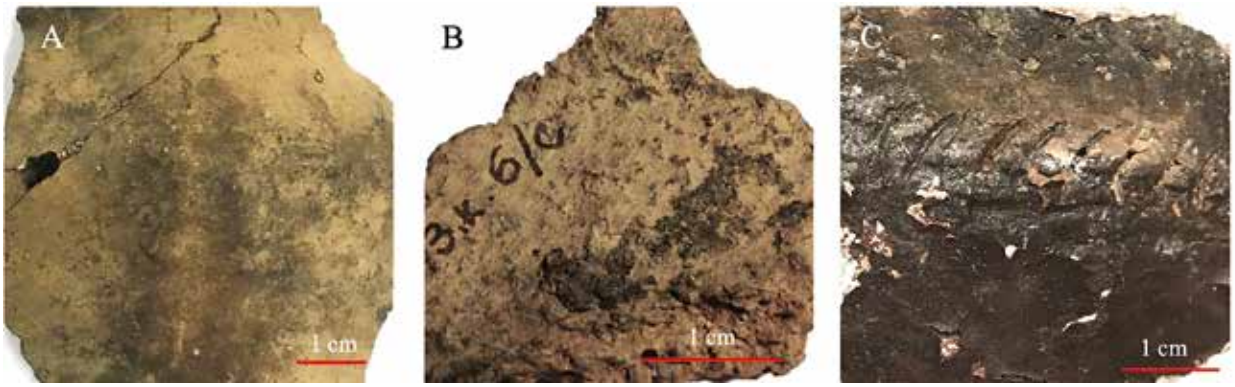

Fig. 8. Traces of macroscopic residues on pottery (A – soot, Strīķi, LNVM A 16811: 109; B – food crust, Bīlavas, LNVM VI 325: 6; C – tar (?) residue, Mušiņas, TŪ 1303:I:1-II:3), *photos: V. Haferberga*.
8 pav. Makroskopinių liekanų pėdsakai ant keramikos (A suodžiai, Strīķi, LNVM A 16811: 109; B - maisto degėsiai, Bīlavas, LNVM VI 325: 6; C - deguto (?) likučiai, Mušiņas, TŪ 1303: I:1-II:3), *V. Haferberga nuotraukos*.

Plastic elements

Few vessels (7 cases) have added plastic elements – either knobs or handles. The last have been found in majority of cases, only two vessels from Ķivutkalns and Mušiņas had knobs. In the case of Bīlavas and Mušiņas, handles were added to urns, although in Lülle and Ėgliškiai household vessels included cups and a jug (Fig. 7: 3–4,9–11,18).

Handles and knobs had similar placement as they were added to the neck area of the vessel, although handles were larger and reached the middle of the vessel as well. The main difference between the two is that handles have wider holes than knobs. The last is also thicker – more massive.

As previously described, the handle of the Ėgliškiai jug was ornamented which is not typical for other such plastic elements. However, handles found in Bīlavas and Lülle are similar as they have kind of protrusions on the surface (Šturms 1931, Tafel V; Lõugas 1970, Joon 5, 112).

TRACES OF USAGE

Macroscopic traces of usage can be distinguished in the few of the vessels (8 cases), mostly soot and food crust, although some substances were also distinguished (Appendix 3, Fig. 8: A–C). Notably, the majority of use traces were distinguished in/on urns, not household vessels.

Food crust has been found in two urns, in one case it was on the outer surface (Bīlavas), on other – inner (Ėgliškiai). In two cases (Dārznieki, Paveisininkai) soot was distinguished in the inner wall of the vessel, in turn in Strīķi – on the outer wall. Notably, seemingly residue from tar-like subsistence was distinguished on the striated urn from Mušiņas stone ship setting (Šturms 1931, 112). At the moment, this subsistence is not yet identified but could indicate processing of the vessel before using it as an urn. Lastly, in the vessel from burial no. 204 in Ķivutkalns, a white subsistence was found (Denisova et al. 1985, 36) (Fig. 7: 5). Based on chemical analysis, the white mass is calcium carbonate.[6]

No other macroscopic traces of use were distinguished in the material analysed.

[6] Identification was done by chemist of LNVM M.sc.chem Indra Tuņa in 2020. Used methods: microscopy, thermocontrol, microchemical/histochemical reactions and Raman spectroscopy. Protocol no. 2797/20.

DISCUSSION AND CONCLUSIONS

Although attributes to graves in the form of artefacts was not a dominant practice at all during Eastern Baltic Bronze and Pre-Roman Iron Age, the gathered data indicates that it plays a significant role in burial rites of some individuals in each cemetery analysed. Widespread interpretation within studies regarding this aspect is social hierarchy, where richer and more significant individuals within society have richer and more carefully made burials than the rest (Vasks 2015, 158). Evidently this is seen even by the typology of burials themselves, where some are placed within more or less carefully made stone cists or other structures, while the remains of others are simply scattered or put into a simple pit.

Regarding the burial pottery itself, two roles can be distinguished – a vessel for the remains of the deceased (urn) and grave goods given to the deceased. Urns logically serve the purpose only for cremations, while in turn grave goods were distinguished in both inhumations and cremations. Urns were generally larger in their size than custom vessels as there was a need for larger space for the cremated remains. In several burials, small or even miniature sized vessels were given with the deceased. Those were likely either cups or larger vessels, probably for drink and a meal given with the deceased in the afterlife. This could explain why the vessels were put in the head area of the deceased, i.e., for food and drink to be closer to the mouth of the individual. Although food is usually associated with pottery, in several coffin burials in Ķivutkalns, space was either carved or left above the head of the deceased, presumably for putting various type of food in it (Denisova et al. 1985). Such a practice could be applicable for other burials as well, although at that time soil from burials was not sampled, thus we lack precise data on this aspect. Cups and vessels found in the burials might be the property of the individual, and had been used in everyday life then symbolically given to the deceased in the afterlife similarly as other items. Such a practice – adding drinking and medium sized vessels to burials, was common in Mälardalen (central Sweden) during the Middle – Late Bronze Age as well (Eriksson 2009, 223–232). Meal as a custom as well as the pottery sherds found in the surroundings could indicate a burial feast, as this practice had a significant role in the Bronze – Pre-Roman Iron Age societies overall (Eriksson 2008, 2009).

Another interesting aspect related to burial traditions is the relationship between burial pottery and finds. Overall, other finds together with burial is more common in cases where a vessel has been used as a custom to the burial. Of particular interest here is Bērzkalni cemetery where a bone artefact (figurine?) was placed into a vessel. A possible analogy there is from Lipši cemetery with an LBA skeletal child burial: a small, striated vessel in association with an amber pendant, probably placed inside (Daiga 1976, 42). In turn, in Ėgliškiai cremation no. 5 (barrow 5) unidentifiable bronze artefacts were placed in an urn (Grigalavičienė 1975). Such a practice – placing artefacts (jewellery, pottery, tools) in an urn with the deceased is seen in other sites in present-day Lithuania, for example, Kvietiniai and Rūdaičiai II (Vengalis et al. 2020; Michelbertas 1963). Notably, this was also a widespread practice in stone ship setting burials in Gotland. However, there are no clear traces of this practice in the ship settings of Saaremaa and Courland (Wehlin 2013).

Notably, some of the urns had macroscopic traces of soot and food crust, indicating that they were used as household vessels before being an urn, i.e., was the property of the deceased. This is especially seen by the organic residue analysis in Bīlavas, where aquatic absorbed residue was distinguished in sherds from an urn (Visocka 2022, 140). However, one must keep in mind that soot traces on vessels might have appeared during practices of burial rites connected with fire, but this is not likely the case with the food crust residues distinguished. Impurities of food crops found in the clay paste of Dārznieki vessel indicates that it was made in the living site where food crops were prepared in the

surroundings. In the inner wall of this vessel, soot was distinguished, however, at the moment it is impossible to determine whether the vessel was purposely made as an urn or was used for household purposes.

Comparing burial pottery to household vessels, it is seen that overall urns and grave goods follow different general patterns regarding profile shape and surface treatment. The majority of household vessels are barrel shaped (IC), only in some regions (CS, S) curved is more common, whereas curved vessels predominate within burial pottery (ibid., 108). A similar situation is seen regarding surface treatment, the striated type is dominant within household vessels, whereas burial pottery is mainly with smooth surface, only in Bērzkalni and Paveisininkai striated pottery is dominant (Ibid., 109).

However, technology-wise the burial pottery was made by the same principals, i.e., medium coarse till clay was predominantly used and tempered with crushed granite, just like in household vessels (Ibid., 97–101). Only in a few cases, clay was finer and a different temper was used – quartzite and grog. Quartzite was distinguished in an urn from Paveisininkai. At the moment, the only analogy with such a tempering material from the region is found in Laukskola settlement, dating from a similar period (Visocka et al. 2021, 85–87). In turn, grog, although rare, was more common in living sites. Such a tempering material has been distinguished in Klaņģukalns, Padure and Paplaka hillforts (Visocka 2022, 92).

Other similarities are seen regarding ornamentation patterns, and in the majority of cases, vessels are not ornamented. However, the ones with ornamentation have simple pits on the upper part of the vessel, in one case the whole body. In a few cases, line incisions or nail impressions have been distinguished. In this aspect, a jug from Ėgliškiai is unique not only by the ornamentation, but shape as well. Closest analogies of such a type of vessel have been distinguished in the Sambian peninsula (Muradian 2024, 132–133).

In a way the ones found in stone ship settings stand out from the rest of the burial pottery. There are similarities among the pottery from stone ship settings of Courland region. Here, the vessels with handles, knobs and curved/biconical shape are common, complemented with nail impressions on the curve/breakage area of it. Notably, similar vessel but without handles or knobs was also found in Zaķi stone ship setting near Bīlavas and Mušiņas (Šturms 1931, Tafel V, upper photo). Among these vessels, next to seemingly non-local elements, local pottery traditions such as striated surface treatment (Bīlavas, Mušiņas) can be distinguished.

These first results of burial pottery analyses show the great potential in interpreting socio-cultural and technological patterns and their meaning in burial rites of eastern Baltic Bronze and PRIA. The data gathered indicates various technological patterns and ideological practices which widens the perspective of understanding the cultural behaviour of past societies. More comparative research in wider scope, fully covering the cemeteries and their pottery in the eastern Baltic region, is needed to distinguish regional techno-stylistic patterns and transmission of burial practices between societies.

Acknowledgements

The study was funded by the University of Latvia project "Past Cognition in Sources and Research: Latvia in the Context of Baltic History II" (AAP2016/B046).

Authors are thankful to staff of National History Museum of Latvia, National Museum of Lithuania, Tallinn University Repository of Archaeological materials, Tartu University Archaeological collection and Repository of Archaeological materials, University of Latvia for their assistance; as well as Faculty of Science and Technology, University of Latvia for allowing to use their facilities to conduct petrographic analysis. Authors are also thankful to the two anonymous reviewers for their helpful recommendations and additions.

Appendix 1. General information of the cemeteries analysed in this study

1 priedas. Bendra informacija apie šiame tyrime aprašomus kapinynus

No.	CEMETERY	LOCATION	EXCAVATIONS	TYPE, DESCRIPTION	FINDS	CHRONOLOGY (RANGE)	REFERENCES
1.	Bašķi	Dienvidkurzeme Munic.; next to Barbāni, Bašķi and Timbri houses, approx. 100 m from river Šventoji, on its right shore	1938, Pēteris Stepiņš	Barrows. Three out of whom two researched; I – diam. – 14 m, h – 0,65 m; II – diam. – 14 m, h – 0,52 m; III – heavily disturbed; I, II – with stone rings and pavement of stones	I – pottery sherds, calcined bones, Late La Tène type bronze brooch (in ploughed level); four urns; II – calcined bones (in stacks without urns), two pottery sherds	800–500 cal BC; 500–200 BC (typology)	Stepiņš 1943; Ciglis, Vasks 2017; Ciglis 2021
2.	Bērzkalni (also Mantu/ Milzu kalniņš)	Jēkabpils Munic.; between houses Ķīves and (ex.) Bērzkalni, next to road Baltezers-Ķīves	1976, Elvīra Šnore	Barrow. Diam. – 18 m, h – 1 m; Due to plaughing it was disturbed and smaller during the excavation, stones were also refracted by locals; made out of sand and stones; Inhumations of LBA/PIA of three individuals; Some Iron Age burial traces were also distinguished	Burial no. 2 – ceramic vessel with bone figurine inside; no. 3 – ceramic vessel; Finds from Iron Age burials (6th to 8th century AD) were also distinguished	500–1 BC (based on typology)	Šnore 1976, 1977
3.	Bīlavas	Talsi Munic.; approx. 300 m to NW of house Vecbīlavas, near highway Nogale-Laube	1861, "excavation" by locals; 1863, Julius Döring; 1999, Andrejs Vasks	Stone ship setting. Two "ships", connected in a row, oriented NW-SE; SE ship – lenght – 15,45, width – 4,5 m, h – 0,91 m; NW ship – 14,95x3,05 m, h – 0,71 m; made of granite and limestones; stone chambers in various levels; urn and non-urn cremations	SE ship – calcined bones, connectable pottery sherds from urn, bronze dagger blade (last not preserved); NW ship – calcined bones, pottery sherds	1400–800 cal BC or 1200–1000 cal BC (based kn analogies)	Šturms 1931; Vasks 2000a; Wehlin 2013
4.	Buļļumuiža	Limbaži Munic.; approx. 300 m from house Dravnieki (ex. Buļļumuiža)	1929, Eduards Šturms; 1930, Valdemārs Ģinters; 1965, Jānis Graudonis	Barrows. 30 barrows in different sizes; During melioration works majority has been destroyed; Archaeologycally researched – six barrows; Size range – diam. from two to 30 m, h – 0,2 – 3 m; with stone rings and pavements, cists; double-barrows; some disturbed by treasure hunters	1 – no finds; 2 – no finds; 3 – pottery sherds; 4 – pottery sherds, bronze bracelet(?) fragment; 4A – no finds; 17. – in the soil piled up on barrow – bronze tool, two iron knifes, fragment of needle and socket-type spear head	970–400 cal BC	Šturms 1929; Ģinters 1930, 1931; Graudonis 1966; Ciglis, Vasks 2017; Vasks 2021a

No.	CEMETERY	LOCATION	EXCAVATIONS	TYPE, DESCRIPTION	FINDS	CHRONOLOGY (RANGE)	REFERENCES
5.	Dārznieki	Dienvidkurzeme Munic.; On the N of river Dubeņa, near house Dārznieki	1935, owner dug a hole; 1936, E. Šturms	Barrow. One barrow with three (?) stone cists, one with urn inside; during historical times six individuals were buried in the barrow	Calcined bones, one sherd, urn with calcined bones	1000–850 cal BC	Šturms 1944; Ciglis, Vasks 2017; Vasks 2021b
6.	Ėgliškiai	Kretinga district Munic.; Left shore of river Dane, on both sides of Klaipėda-Kretinga highway	1895, Alfred Götze; 1898, Adalbert Bezzenberger; 1969, 1974–1975, 1980–1981, Elena Grigalavičienė and Ignas Jablonskis, 2005, Julius Kanarskas	Barrows. Eight barrows, all researched. 1 – 3 merged together (triple barrow); stone rings and structures, cists; inhumation and cremated burials, some in urns; Range of size, diam – 7 to 26 m, h – 0,3 – 2 m	More than 80 finds in all barrows, including pieces of amber, bronze and iron jewlery, including pins, La Tène type brooches, set of temple rings and pin; Urns with cremated bones, household(?) pottery; burned artefacts	800–400 cal BC; 400–200 BC (typology)	Grigalavičienė 1979, 1995; Merkevičius 2014; Muradian 2022; Visocka 2022
7.	Ķivutkalns	Salaspils Munic.; Dole island in river Daugava (now under the water reservoir of HPP of Rīga)	1966–1967, J. Graudonis	Flat cemetery. 247 inhumations and 21 cremation burials; made out of clay and stones; some in wooden coffins, including cremations, some individuals of skeletal graves tied up before put into coffin; Burial pits covered with red clay, ochre or white sand	54 bone pins, eight fragments of amber jewlery, two animal teeth pendants, bone comb, bronze spiral, animal bones and pottery	800–680 cal BC	Denisova et al. 1985; Vasks, Zariņa 2014
8.	Lülle	Saaremaa in Sorve region, near Lülle village	1967, Vello Lõugas	Stone ship setting. Two ships connected in a row, oriented NE-SW; SW ship – lenght – 7,5 m, width – 2,5 m; NE – lenght – 6 m, width – 3,5 m; Stone boxes, cist(?); Granite and Jotnian sandstones	Sherds from two ceramic vessels, bronze arrowhead and tweezers, unidentifiable bronze plate, stone axe and grinding stone	800–500 cal BC	Lõugas 1970; Wehlin 2013
9.	Mušiņas	Talsi Munic.; near village Lube and (ex.) house Mušiņas, near river Roja	1874, Theodor Buchardt	Stone ship setting. Two "ships", connected in a row, oriented NW-SE; SE ship – lenght – 9,45 m, width – 2,55 m, h – 1,2 m; NW ship – lenght – 8,25, width – 3,96 m; both made out of granite and sand; before excavation both were disturbed; Stone boxes, including double-box with capstones in both ships	In each cist of the ships, urns were found, containing ashes and calcined bones	1200–1000 BC (based on typology and analogies)	Šturms 1931

No.	CEMETERY	LOCATION	EXCAVATIONS	TYPE, DESCRIPTION	FINDS	CHRONOLOGY (RANGE)	REFERENCES
10.	Paveisininkai	Lazdijų region; In peninsula next to lake Viesiejo	1962, Pranas Kulikauskas	Flat cemetery. 28(?) cremation burials; Six in pits, eight in cists, two of whom in urns and 14 in urns (pits, covered with stones or in stone boxes); Overall nine were placed in the rampart area, 18 in the plateu	17 burials urns were found	800–550 cal BC	Kulikauskas 1970, 1995; Merkevičius 2014; Piličiauskas et al. 2011
11.	Pukuļi	Dienvidkurzeme Munic.; Near village Bārta, between ex. houses Pukuļi and Stiebri	1962–1963, P. Stepiņš, 1979–1981, A. Vasks	Barrows. 14 barrows; 13 archaeologically studied; Heavily disturbed by works in gravel quarry (6th completely destroyed); Size ranged from 10–13 m in idam., h – 0,6–1,2 m; Base covered in stones, symbolical "enterances" distinguished, stone cists; Cremations, skeletal remains were not preserved, inhumations were only indicated by cists	Fragments of bronze bracelet twisted from segmental-type wire, 15 pottery sherds	1600–1000 cal BC	Vasks 2000b; Ciglis, Vasks 2017
12.	Reznes	Salaspils Munic.; On unnamed small island between river Daugava and Jurupīte (now under water due to construction of Rīga HPP)	1900, Anton Buchholtz; 1933, 1935, E. Šturms; 1958, 1969, J. Graudonis	Barrows. Eight (known) barrows; Six were archaeologically researched; During 1957 one barrow (no. 7) was completely destroyed; Size range – diam. – 20–24 m, h – 1,6–3 m; Stone pavement, ring; Inhumations in cists and without, cremation burials; Ritual structures	48 finds, including amber, bronze, clay and flint jewelry and tools, pottery sherds, almost 150 animal teeth (horse, taurus), stray finds – pottery, amber pendant and fragment of casting mould	1450–550 cal BC	Graudonis 1961, 1970; Ciglis, Vasks 2017; Legzdiņa et al. 2020; Vasks et al. 2021
13.	Strīķi (also Pasiekste)	Ventspils Munic., Vārve parish; Between ex. houses Strīķi and Pasiekste	1869, August Friedrich von Raison; 1888, Karl Boy; 1895, Vladimir Sizov; 1932, Hugo Riekstiņš	Barrow. Damaged, diam. – 20 m, h – 1,3 m; Constructions unknown due to lack of documentation; One PIA inhumation on bedrock; Later Iron Age burials distinguished	Pin (swan neck type), pottery sherds – stray finds, burial – neck ring, amber bead and urn	200–1 BC (based on typology)	Riekstiņš 1932a; Balodis 1956; Mugurēvičš 2000; Graudonis 2001

Appendix 2. Results of petrographic analysis

2 priedas. Petrografinės analizės rezultatai

GROUP	SAMPLE INFORMATION			CLAY							TEMPER					NOTES
	CODE	CONTEXT	SURFACE TREATMENT	COARSENESS	SORTNESS	SILT	F. SAND	C. SAND	MICA	FE CON.	TEMPER	VOLUME, %	MAX SIZE, MM	MAX AVG SIZE, MM	HOMOGENITY	
FABRIC 1	LUL3	4409:18	striated	M	M	+	++	+	*	*	Granite	20,3	2,3	1,44	W	Quartz; K-feldspar – orthoclase, microcline; opaque minerals; accessory minerals
	PAV3	AR 440:17/17th burial	striated	M	U	*	++	+	+	*	Granite	20,5	2,1	1,1	M	Quartz; K-feldspar – microcline, orthoclase; biotite; accessory minerals; opaque minerals
	STRI2	A 10811:109	striated	M	U	+	+	*	+	+	Granite	17,3	2,3	1,24	M	Quartz; K-feldspar + orthoclase with with myrmekitic intergrowths; clay pellets; size of larges Fe concretion – 0,7 mm
FABRIC 2	MUS2	1303:II:3	coarse-slipped	M	M	+	+	+	++	++	Granite	7,3	2	1,4	M	Quartz; K-feldspars – microcline, orthoclase; plagioclase; opaque minerals; accessory minerals; size of largest Fe concretion – 2,2 mm
	MUS3	1303:II:3	striated	M	U	++	++	+	++	++	Granite	9,2	1,95	1,32	W	Quartz; K-feldspar – orthoclase, microcline; biotite; opaque minerals; accessory minerals; charcoal; outer wall coloured? Size of largest Fe concretion – 3 mm
FABRIC 3	EG1	AR 636:48/ Barrow 3, 9th burial	smooth	C	U	++	++	++	*	-	Granite	7,6	2,7	1,18	N	Opaque minerals; sandstone; K-feldspar – orthoclase with myrmekitic intergrowths; quartz; accessory minerals; biotite; few clay pellets
	KIV-k41	VI 120/ 41st burial	smooth, line ornamen–tation	C	U	++	++	+	++	-	Granite	10,6	2,3	1,67	M	Muscovite; quartzs; K-feldspars – orthoclase; plant remains? Within some voids superficial material is distinguished, likely from groundwater

GROUP	SAMPLE INFORMATION			CLAY							TEMPER					NOTES
	CODE	CONTEXT	SURFACE TREATMENT	COARSENESS	SORTNESS	SILT	F. SAND	C. SAND	MICA	FE CON.	TEMPER	VOLUME, %	MAX SIZE, MM	MAX AVG SIZE, MM	HOMOGENITY	
FABRIC 4	BIL 6/c_b	VI 325:6/ layer 2, q. 6/c	smooth	M	M	+	++	*	+	-	Granite	28	4,2	2,26	W	Biotite; quartz; opaque minerals; accessory minerals; K-feldspars
	EG2	AR 636:5/ Barrow 2, 5th burial	rusticated	M	U	++	+	+	*	-	Granite	18	4,3	1,44	N	Opaque minerals; quartz; K-feldspars; voids from plants? Quite many clay pellets; clay slip (from rustication) distinguishable
FABRIC 5	MUS1	1303	smooth?	M	U	++	++	+	*	-	Granite	11,3	1,9	1,52	W	Quartz; K-feldspar; plagioclase; accessory minerals; opaque minerals; charcoal; plant?
FABRIC 6	PAV2	AR 440:16/15th burial	coarse-slipped	M	U	+	++	+	+	-	Quartzite	11,3	2,9	1,68	W	Quartzite; quartz; K-feldspar – orthoclase, microcline; opaque minerals; accessory minerals; biotite
FABRIC 7	KIV-k43	VI 120/ 43rd burial	polished	M	M	+	+	*	*	*	Very coarse sand	3,5	1,2	0,94	W	Quartz; plagioclase; accessory minerals; plant remain? largest Fe concretion – 0,2 mm
FABRIC 8	LUL1	4409:30	polished	F	S	+	*	*	*	-	Sand + granite + grog	12,6	2,7	1,7	M	Quartz; K-feldspar + orthoclase with myrmekitic intergrowths; accessory minerals
FABRIC 9	STRI1	A 10811:109	smooth	M	U	+	++	+	++	*	Granite	11	1,3	0,98	M	Quartz; plagioclase; accessory minerals; opaque minerals; biotite, muscovite; size of largest Fe concretion - 0,5 mm; similar to Fabric 5, but with iron concretions within matrix

– none; + – common; ++ – rich; * – sparse; C – coarse; F – fine; M – medium; N – not; U – unsorted; W – well; Codes: BIL – Bīlavas; EG – Ėgliškiai; KIV – Ķivutkalns; LUL – Lülle; MUS – Mušiņas; PAV – Paveisininkai; STRI – Strīķi

Appendix 3. Data of macroscopic evaluation of the pottery

3 priedas. Makroskopinio keramikos vertinimo duomenys

Site	Inv.No./Context	Surface treatment	Diameter, cm	Wall thickness, cm	Temper, mm	Shape	Notes	References
BAŠĶI	A10086:10/ Barrow 1	striated-coarse slipped		1	5	S		This study
	A10086:10/ Barrow 1	polished		0,45	2	S	nail impressions on upper rim and outer rim	This study
	A10086:9/ Barrow 1	smooth		0,75	4	S	nail impressions on top of the rim	This study
	A10086:9/ Barrow 1	smooth		0,65	3	CS	nail impressions on top of the rim	This study
	A10086:9/ Barrow 1	smooth		1	4	CS	inner wall coarse slipped	This study
	A 10086:8/ 4th urn	smooth		0,6	2	S	nail impressions on top of the rim	This study
	A 10086:7/ Barrow 1	polished		0,9	3	S	nail impressions on top of the rim	This study
	A 10086:11/ Barrow 1	smooth		0,95	3	IK	nail impressions on top of the rim	This study
BĒRZKALNI	VI210: 5/ 2nd grave	striated	6,3	0,4	5	CS	Bone figurine in the vessel; Inhumation	This study
	VI210: 7/ 3rd grave	striated	11	0,5	5	S	Inhumation	This study
BĪLAVAS	VI325:6/ q. 6/c, layer 3	striated	16	1	7		food crust	This study
BUĻĻUMUIŽA	A 63907:1/ Barrow 4	striated		0,9	3,5	CS	pit ornamentation - diam. 7 mm	This study
	A 9961:5/ Barrow 4, area D	smooth	9	0,6	2,5	IC		This study
	A 63908/ Barrow 4	striated		0,7	2	CS		This study
DĀRZNIEKI	A 8848:2/ depth: 1,10-1,40 cm	smooth	22	1,1	3,5	CS	urn; calcinated bones inside	This study
	A 8848:4	polished		0,7	2,5	S		This study
	A 8848:4	striated coarse slipped		0,95	4,5	S	four fragments one with seed imprints; soot? In the inner wall	This study

Site	Inv.No./Context	Surface treatment	Diameter, cm	Wall thickness, cm	Temper, mm	Shape	Notes	References
ĖGLIŠKIAI	AR 636:5/ Barrow 2, 5th cremation	rusticated	21,5	1,25	5	S	Food crust in the inner wall, h - 20 cm; urn	This study
	AR 636:6/ Barrow 2, 6th cremation	smooth	5,6			cup-shaped	h - 6,6 cm, handle; vessel	Butėnienė 1985, Grigalavičienė 1974
	Barrow 3, 1st cremation	smooth		0,6			Various sherds from one urn	Butėnienė 1985, Grigalavičienė 1974
	Barrow 3, 5th cremation	smooth		0,6			Three sherds	Grigalavičienė 1974
	AR 636:27/ Barrow 3, 6th inhumation	smooth	12,5			CS	h - 9,5 cm; Inhumation	Butėnienė 1985, Grigalavičienė 1974
	AR 636:48/ Barrow 3, 9th cremation	smooth	23	0,8	7	S	2nd urn	This study
	AR 636:49/ Barrow 3, 9th cremation	smooth		0,9			1st urn	Butėnienė 1985, Grigalavičienė 1974
	AR 636:50/ Barrow 3, 13th cremation	polished	8,5			jug-shaped	ornamented with vertical and inclined lines and small incisions; double handle; h - 24 cm	Butėnienė 1985, Grigalavičienė 1974
	AR 636:51/ Barrow 5, 1st cremation	smooth		0,8		CS?	four sherds, one with pit?	Butėnienė 1985, Grigalavičienė 1975
	AR 636:52/ Barrow 5, 3rd cremation	smooth	20	0,85	6,5	S	h - 13 cm	This study
	AR 636:54/ Barrow 5, 4th cremation	smooth	17,5	0,5		S	h - 14 cm	Butėnienė 1985, Grigalavičienė 1975
	AR 636:55/ Barrow 5, 5th cremation	smooth		0,6		CS	three sherds	Butėnienė 1985, Grigalavičienė 1975
	AR 636: 56/Barrow 5, 6th cremation	smooth	17,3	0,7	4	S	h - 14,5 cm	This study
	AR 636:53/ Barrow 5, 7th cremation	smooth	20	0,85	5,5	S	h - 15 cm	This study

Site	Inv.No./Context	Surface treatment	Diameter, cm	Wall thickness, cm	Temper, mm	Shape	Notes	References
ĶIVUTKALNS	VI 120a/ 1st grave	smooth	10	0,7	7	IC		This study
	VI 120a:24/ 32nd grave	striated		1	7	CS	line ornament	This study
	VI 120a/ 41st grave	striated		0,85	7		large mica grains	This study
	VI 120a/41st grave	smooth	18	0,8	3,5	IC		This study
	VI 120a/ 42nd grave	polished		0,65	3	IC		This study
	VI 120a/ 43rd grave	polished		0,7	2	IC	small iron compounds	This study
	VI 120a/ 70th grave ?	smooth		0,8	6,5	IK	knob	This study
	VI 120a/ 75th grave	striated		1,05	4,5	IC		This study
	VI 120a/ 80th grave	polished		0,6	3,5	IC		This study
	VI 120a/ 81st grave	smooth		0,7	2	IC		This study
	VI 120a/ 204th grave	smooth	9	0,9	4,5	IC	white residue inside	This study
LÜLLE	AI 4409:18	striated		1,1	6	CS		This study
	AI 4409:33	polished	12	0,75	4,5	cup-shaped	handle	This study
MUŠIŅAS	NW ship, NW box, 1303:i-1-II:3	striated	14	0,9	4	IK/K	with nail impression ornamentation on neck and handle, tar-like residue on surface, h - 15 cm	This study; Šturms 1931
	SE ship, SW chamber, 1303:I:1	cosrse slipped	12,5	1,4	3,5	IK/K	with knob, iron compound concretions, h - 21,5	This study; Šturms 1931
	AR 440:8/ 1st burial	striated	17,5	1		CS	h - 8 cm	Kulikauskas 1962, Griciuvienė 2005
	AR 440:9/ 3rd burial	striated	36			CS	h - 27,5 cm, pit ornament	Kulikauskas 1962, Griciuvienė 2005
	AR 440:10/ 4th burial	rusticated	10	0,8		IC		Kulikauskas 1962, Griciuvienė 2005

Site	Inv.No./Context	Surface treatment	Diameter, cm	Wall thickness, cm	Temper, mm	Shape	Notes	References
PAVEISININ-KAI	AR 440:11/ 5th burial	striated	12	0,9		CS	pit ornamentation, h - 11 cm	Kulikauskas 1962, Griciuvienė 2005
	AR 440/ 7th burial	striated	15				pit ornamentation, h - 13 cm	Kulikauskas 1962
	AR 440/ 9th burial	striated		0,8			buttom part	Kulikauskas 1962, Griciuvienė 2005
	AR 440:12/ 11th burial	striated coarse slipped	16			C	ornamented, h - 12,6 cm	Kulikauskas 1962, Griciuvienė 2005
	AR 440:13/ 12th burial	striated	15			CS	ornamented with pits, h - 19 cm	Kulikauskas 1962, Griciuvienė 2005
	AR 440:14/ 13th burial	striated	11			CS	fully ornamented with pits, h - 11 cm	Kulikauskas 1962, Griciuvienė 2005
	AR 440:15/ 14th burial	striated coarse slipped	15,5			CS	pit ornamentation; h - 18,5 cm	Kulikauskas 1962, Griciuvienė 2005
	AR 440:16/ 15th burial	striated coarse slipped	14	0,9	3,5	CS?		This study
	AR 440:17/ 17th burial	striated	16	0,85	3,5	CS?	soot on the inside of the vessel	This study
	AR 440:18/ 19th burial	striated	24,5			IK	h - 26,5 cm	Kulikauskas 1962, Griciuvienė 2005
	AR 440:19/ 20th burial	smooth	12,8			CS	ornamentated with pits; h - 15,4 cm	Kulikauskas 1962, Griciuvienė 2005
	AR 440:20/ 21st burial	striated	17	0,7	4,5	IC?		This study
	AR 440:21/ 22nd burial	striated	18	0,7	3	IC?		This study

Site	Inv.No./Context	Surface treatment	Diameter, cm	Wall thickness, cm	Temper, mm	Shape	Notes	References
PUKUĻI	A12493:3/ Barrow 9	smooth		0,8	3	IC	vertical line incisions	This study
	A 12493:4/ Barrow 9, base layer	smooth	6	0,9	3,5	IC		This study
	A 12531:3/ Barrow 11	smooth		0,6	2,5	CS		This study
REZNES	A 11769:10-11/ Barrow 6, 1o-a	smooth		0,95	5	S	vertical line ornament	This study
	A11769:18/ Barrow 6, 3rd burial	striated		0,8	3			This study
	A11769:20/ Barrow 2	smooth		1,5	2	IC		This study
	V8375/ 12th burial	striated		0,65	2	S		This study
	V8378/Barrow 2, burial 26	smooth	8,7	0,7			h - 7,7 cm	Graudonis 1961
STRĪĶI	A10811:109/ Barrow 1	smooth	8	0,75	3	S	iron compound concretions, soot on the outer wall	This study
		smooth		0,8	4,5	CS	motif of cord impressions, soot on the outer wall	This study
		polished		0,8	1	S		This study
		striated		1,1	4,5	IC		This study
		smooth		0,75	1,5	CS		This study
		polished		0,7	3,5	CS	in upper rim line incisions	This study
		smooth		0,95	3,5	S	nail impression ornamentation	This study
		polished		0,6		CS		This study
		smooth		0,65	5	K		This study

REFERENCES

Balodis, F., 1956. *Senā Latvija*. Čikāga: Dzimtā Zeme.

Butėnienė, E., 1985. Cartography of Ėgliškiai barrow cemetery pottery. LNM, AR 636.

Ciglis, J., 2021. Bašķu senkapi. In: eds. Vasks, A., Zariņa, G. *Latvijas arheoloģijas rokasgrāmata*. Rīga: Zinātne, 271–272.

Ciglis, J., Guščika, E., Muižnieks, V., Vasks, A., Vilcāne, A., 2021. Senkapi un kapsētas. In: eds. Vasks, A., Zariņa, G. *Latvijas arheoloģijas rokasgrāmata*. Rīga: Zinātne, 259–268.

Ciglis, J., Vasks, A., 2017. Jauni bronzas un senākā dzelzs laikmeta apbedīšanas vietu datējumi ar radioaktīvā oglekļa metodi. *Latvijas vēstures institūta žurnāls*, 1 (102), 35–61.

Daiga, J., 1976. Izrakumi Lipšu ciemā un kapulaukā. *ZASM par arheologu un etnogrāfu 1975. gada pētījumu rezultātiem.* 39–46.

Danilaitė, E., 1970. *Egliškių pilkapių, Kretingos raj., tyrinėjimai 1969 m*. LII archaeological collection, Inv. No. 270.

Denisova, R., Graudonis, J., Gravere, R., 1985. *Kivutkalnskij mogilnik epokhi bronzi*. Riga: Zinatne.

Döring, J., 1864. Die Teufelsböte in Kurland. In: *Sitzungsberichte der Kurländischen Gesellschaft für Literatur und Kunst aus den Jahren 1850 bis 1863*, Mitau. 154–165.

Dumpe, B., 2006. Agrās tekstilās keramikas faktūru veidošanas īpatnības. *Arheoloģija un Etnogrāfija*, 23, 71–84.

Dumpe, B., 2021. Trauki. In: eds. Vasks, A., Zariņa, G. *Latvijas arheoloģijas rokasgrāmata*. Rīga: Zinātne, 493–509.

Eriksson, T., 2008. Pottery and feasting in Central Sweden. In: ed. Berg, I. *Breaking the Mould: Challenging the Past through Pottery*. Oxford, 47–55.

Eriksson, T., 2009. *Kärl och social gestik. Keramik i Mälardalen 1500 BC–400 AD*. Uppsala.

Ģinters, V., 1930. *Ziņojums par arheoloģiskajiem izrakumiem Buļļumuižā 1930. gadā*. LNVM AA 38.

Ginters, V., 1931. Die Steinkistenhügelgräbern von Buļļumuiža. *Congressus Secundus Archaeologorum Balticorum Rigae,* 19.–23. VIII.1930. Acta Universitatis Latviensis Philologorum et Philosophorum ordinis series, Tomus I, Supplementum I. 423–436.

Graudonis, J., 1961. Reznu kapulauks. *Arheoloģija un Etnogrāfija*, 3, 19–38.

Graudonis, J., 1966. Buļļumuižas uzkalniņkapu arheoloģiskie izrakumi 1965. gadā. *ZASRT par arheologu un etnogrāfu 1965. gada pētījumu rezultātiem*, 19–21.

Graudonis, J., 1970. Reznu kapulauks. *ZASRT par arheologu un etnogrāfu 1969. gada pētījumu rezultātiem*, 20–23.

Graudonis, J., 2001. Agro metālu periods. 1500.–1. g. Pr. Kr. In: eds. Mugurēvičs, Ē., Vasks, A. *Latvijas senākā vēsture. 9. g. t. pr. Kr. – 1200. g.* Rīga: LVI apgāds, 116–185.

Grewingk, C., 1878. *Die Steinschiffe von Musching und die Wella Laiwe oder Teufelsböte Kurlands überhaupt. Eine archäologisch-geologische Studie*. Dorpat.

Griciuvienė, E., 2005. Cartography of Paveisininkai cemetery pottery. LNM, AR 440.

Grigalavičienė, E., 1974. *Ėgliškių pilkapių tyrinėjimai 1974 metais*. LII Archaeological collection, Inv. No. 590.

Grigalavičienė, E., 1975. *Ėgliškių pilkapių tyrinėjimai 1975 metais*. LII Archaeological collection, Inv. No. 591.

Grigalavičienė, E., 1979. Ėgliškių pilkapiai. *Lietuvos Archeologija*, 1, 5–43.

Grigalavičienė, E., 1995. *Žalvario ir Ankstyvasis Geležies Amžius Lietuvoje*. Vilnius: Moklso ir enciklopedijų leidykla.

Hoffmann M., J., 2000. *Kultura i osadnictwo południowo–wschodniej strefy nadbałtyckiej w I tysiącleciu p.n.e*. Olsztyn: Ośrodek Badań Naukowych im. Wojciecha Kętrzyńskiego.

Hulthén, B., 1974. *On documentation of pottery*. Acta archaeologica Lundensia: Series in 8⁰ minore. Lund.

Kulikauskas, P., 1970. Paveisininkų, Lazdijų raj., piliakalnis ir jo tyrinėjimai. *Lietuvos TSR aukštųjų mokyklų mokslo darbai. Istorija,* 11, 227–245.

Kulikauskas, P., 1995. *Paveisininkų k. Piliakalnio ir Gyvenvietės (Kapčiamiesčio spyl., Lazdijų raj.) 1962 m. šukių ir radinių sąrašas*. LII Archaeological collection, Inv. No. 115.

Lang, V., 2007. *The Bronze and Early Iron Ages in Estonia*. Tartu University Press.

Legzdiņa, D., Vasks, A., Plankājs, E., Zariņa, G., 2020. Re-evaluating the Bronze and Earliest Iron Age in Latvia: changes in burial traditions in the light of 14C dates. *Radiocarbon*, 62 (6), 1845–1868. https://doi.org/10.1017/RDC.2020.136

Lõugas, V., 1970. Sõrve laevkalmed. In: eds. Jaanits, L., Selirand, J. *Studia archaeologica in memoriam Harri Moora*. Tallinn: Valgus, 111–118.

Merkevičius, A., 2014. *Ankstyvojo metalų laikotarpio laidojimo paminklai Lietuvoje*. Vilnius: Vilniaus universiteto leidykla.

Michelbertas M., 1963. I a. pr. m. e. – IV m. e. a. Rūdaičių kapinyno (Kretingos raj.) tyrinėjimai. *Lietuvos TSR Mokslų akademijos darbai*. Serija A, 2 (15), 55–72.

Mugurēvičš, Ē., 2000. Arheoloģiskie pētījumi Ventas lejteces apgabala dzelzs laikmeta un viduslaiku pieminekļos. Izrakumi Zlēkās. *Arheoloģija un Etnogrāfija*, 20, 74–87.

Muradian, L., 2017. Vėlyvojo žalvario ir ankstyvojo geležies amžiaus laidosena ir visuomenė Šiaurės vakarų Lietuvoje. *Archaeologia Lituana*, 18, 12–28. https://doi.org/10.15388/ArchLit.2017.18.11689

Muradian, L., 2022. First AMS ^{14}C dating of Bronze and Pre-Roman Iron Age cremated bones from barrows in Western Lithuania: Results and interpretation. *Estonian Journal of Archaeology*, 26 (2), 157–183. https://doi.org/10.3176/arch.2022.2.03

Muradian, L., 2024. *Ankstyvojo metalų laikotarpio laidosena Pietryčių Baltijos regiono vakarinėje dalyje*. Daktaro disertacija. Vilniaus Universitetas, Lietuvos istorijos institutas.

Oinonen, M., Vasks, A., Zarina, G., Lavento, M., 2013. Stones, bones, and hillfort: radiocarbon dating of Kivutkalns bronze-working centre. *Radiocarbon*, 55 (3), 1252–1264. https://doi.org/10.1017/S003382220004816

Orton., C., Tyers, P., Vince, A., 1993. *Pottery in Archaeology*. Cambridge: Cambridge University Press.

Piličiauskas, G., Lavento, M., Oinonen, M., Grižas G., 2011. New 14C Dates of Neolithic and Early Metal Period Ceramics in Lithuania. *Radiocarbon*, 53 (4), 629–643. https://doi.org/10.1017/S0033822200039096

Quinn, P., S., 2013. *Ceramic petrography: The interpretation of archaeological pottery and related artefacts in thin section*. Oxford.

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

Riekstiņš, H. 1932a. Kapukalns, kurā uzglabājusees Latwijas aizwesture. *Jaunākās ziņas*, 169, 01.08.1932. 6.

Riekstiņš, H., 1932b. *Arheoloģiskie izrakumi Vārves Strīķu kapenēs*. LNVM AA 187.

Rimantienė, R., 2005. *Die Steinzeitfischer an der Ostseelagune in Litauen*. Vilnius.

Šnore, E., 1976. *Pārskats par 1976. gada arheoloģiskajiem izrakumiem Jēkabpils raj. Gārsenes c/p "Bērzkalnu" kapu uzkalniņā*. LU AMK VIAA:863.

Šnore, E., 1977. Arheoloģiskie izrakumi Gārsenē. *ZASM par arheologu un etnogrāfu 1976. gada ekspedīciju darba rezultātiem*, 62–63.

Sperling, U., Lang, V., 2021. The Bronze and Iron Age transition in the East Baltic – challenges for research. In: eds. Kaiser, E., Schier, W. *Time and Materiality. Periodization and Regional Chronologies at the Transition from Bronze to Iron Age in Eurasia (1200–600 BCE)*. Prähistorische Archäologie in Südosteuropa 31, Rahden/Westf., Marie Leidorf, 265–281.

Stepiņš, P., 1943. *Pārskats par arheoloģiskajiem izrakumiem Rucavas Bašķu kapulaukā 1938. gadā*. LNVM AA 175.

Šturms, E., 1929. *Ziņojums par izrakumiem Limbažu pag. Buļļumuižā 1929. g.* LNVM AA 372.

Šturms, E., 1931. Bronzezeitlichen Funde in Lettland. *Congressus Secundus Archaeologorum Balticorum Rigae,* 19.–23. VIII.1930. Acta Universitatis Latviensis Philologorum et Philosophorum ordinis series, Tomus I, Supplementum I. 103–144.

Šturms, E., 1933. *Pārskats par izrakumiem Salaspils pag. Reznēs 1933. gadā*. LNVM AA 266.

Šturms, E., 1935. *Pārskats par izrakumiem Salaspils pag. Reznēs 1935. gadā*. LNVM AA 267.

Šturms, E., 1944. *Ziņojums par izrakumiem Cīravas Dārzniekos, 12.–15.09.1936*. LNVM AA 167.

Vasks, A., 1991. *Keramika epokhi bronzi i rannego zheleza Latvii*. Riga: Zinatne.

Vasks, A., 1994. *Brikuļu nocietinātā apmetne: Lubāna zemiene vēlajā bronzas un dzelzs laikmetā (1000. g. pr. Kr. – 1000. g. pēc Kr.)*. Rīga: Zinātne.

Vasks, A., 2000a. Bīlavu "velna laivas" izrakumi un rekonstrukcija 1999. gadā. *Arheologu pētījumi Latvijā 1998. un 1999. gadā*, 35–46.

Vasks, A., 2000b. Bronzas laikmeta kapulauks Pukuļos. *Arheoloģija un Etnogrāfija*, 20, 88–106.

Vasks, A., 2003. Akmeņu krāvuma kapulauki Kurzemē. *Arheoloģija un Etnogrāfija*, 21, 141–153.

Vasks, A., 2015. *No medniekiem un zvejniekiem līdz lopkopjiem un zemkopjiem: Latvijas aizvēstures senākais posms (10500–1. g. pr .Kr.)*. Rīga: Zinātne.

Vasks, A., 2021a. Buļļumuižas senkapi. In: eds. Vasks, A., Zariņa, G. *Latvijas arheoloģijas rokasgrāmata*. Rīga: Zinātne, 273.

Vasks, A., 2021b. Dārznieku senkapi. In: eds. Vasks, A., Zariņa, G. *Latvijas arheoloģijas rokasgrāmata*. Rīga: Zinātne, 274.

Vasks, A., Zariņa, G., 2014. Ķivutkalna pilskalns un kapulauks: jauni dati un jaunas problēmas. *Latvijas vēstures institūta žurnāls*, 3 (92), 5–36.

Vasks, A., Zariņa, G., Legzdiņa, D., Plankājs, E., 2021. New data on funeral customs and burials of the Bronze Age Reznes cemetery in Latvia. *Estonian Journal of Archaeology*, 25 (1), 3–31. https://doi.org/10.3176/arch.2021.1.01

Vengalis R., Piličiauskas G., Pilkauskas M., Kozakaitė J., Juškaitis V., 2020. The Large-Scale Rescue Excavation of a Multi-Period Site at Kvietiniai Sheds Light on the so far little explored Bronze Age in Western Lithuania. *Archaeologia Baltica*, 27, 17–50.

Visocka, V., 2018. Švīkātās keramikas izgatavošanas tehniskie aspekti Latvijas teritorijas pilskalnu materiālā. In: eds. Ķeruss, J., Misāns, I. *Studenti vēstures zinātnē, 1. Pirmās starpdisciplinārās Latvijas jauno vēstures pētnieku konferences materiāli.* Rīga. 11–25.

Visocka, V., 2022. *Pottery production, function and meaning during the Bronze and Pre-Roman Iron Age in the eastern Baltic*. Doctoral thesis. University of Latvia.

Visocka, V., Gunnarssone, A., Kalniņš, M., Plankājs, E., 2021. Between Mighty Hillforts: A Multi-method Study of Laukskola Late Bronze Age Settlement Pottery. *Archaeologia Baltica*, 28, 81–100. https://doi.org/10.15181/ab.v28i0.2283

Wehlin, J., 2013. *Östersjöns skeppssättningar – monument och mötesplatser under yngre bronsålder*. GOTARC Serie B. Gothenburg Archaeological Theses 59. Gothenburg, 2013.

Wehlin, J., 2022. Baltic stone ships. Monuments of a "maritory" in Late Bronze Age northern Europe. In: eds. Hofmann, D., Nikulka, F., Schumann, R. *The Baltic in the bronze age: Regional patterns, interactions and boundaries*. Leiden: Sidestone Press, 373–386.

Zariņa, G., Visocka, V., Legzdiņa, D., Ceriņa, A., Plankājs, E., Meža, J., 2023. Dietary practices during the Late Neolithic and the Bronze Age in the territory of Latvia: A case study of Lake Lubāns Wetland and the Lower Daugava. *Latvijas vēstures institūta žurnāls*, 1 (118), 5–28. https://doi.org/10.22364/lviz.118.01

ABBREVIATIONS

EBA – Early Bronze Age (1800–1100 BC)

FRE – Freshwater Reservoir Effect

HPP – Hydroelectric power plant

LBA – Late Bronze Age (1100–500 BC)

LII – Lithuanian Institute of History (Lietuvos istorijos institutas)

LNM – National Museum of Lithuania (Lietuvos nacionalinis muziejus)

LNVM – National History Museum of Latvia (Latvijas Nacionālais vēstures muzejs)

LU AMK – University of Latvia Repository of Archaeological materials (Latvijas Universitātes Arheoloģisko materiālu krātuve)

MRE – Marine Reservoir Effect

Munic. – Municipality

PRIA – Pre-Roman Iron Age (500–1 BC)

PPL – plane polarised light

TLÜ – University of Tallinn

TÜ – University of Tartu

XPL – crossed polarised light

ZASM – Zinātniskās atskaites sesijas materiāli par […]

ZASRT – Zinātniskās atskaites sesijas referātu tēzes par […]

FROM INSIDE AND OUTSIDE: CONTEXTUAL, MACROSCOPIC AND MICROSCOPIC ANALYSIS OF BRONZE AND PRE-ROMAN IRON AGE BURIAL POTTERY FROM THE EASTERN BALTIC

Vanda Haferberga, Joakim Wehlin, Uwe Sperling

Summary

The study is dedicated to the role and techno-typological analysis of burial pottery during Bronze and Pre-Roman Iron Age in the Eastern Baltic. Thirteen cemeteries were analysed in the study dating from EBA–PRIA. Typologically, three types of cemeteries were analysed – barrows, flat cemeteries and stone ship settings. Burial pottery was analysed by their context, macroscopic features as well as by using ceramic petrography. Fourteen thin sections were prepared and analysed within this study.

Two types of burial pottery were distinguished in the cemeteries – urns and grave goods. Urns were primarily used for cremated individuals. Urn burials overall followed the main tendencies of inhumations and cremations without urns. They were either placed in stone structures (cists, boxes) or simply dug into a pit. There are several occasions where a stone base and/or a lid was distinguished in urn burials. Vessels as grave goods were distinguished in both inhumations and cremations. In inhumations the pottery, in the form of cups and medium sized pots, was placed in the head area of the deceased, seemingly closer to the mouth. It is likely that food and drink was also placed with these vessels, in association with feast or food supply given to the deceased in the afterlife. However, these vessels were usually added to the deceased when placed in

stone structures and in all considered burials only one single vessel was distinguished. Some of the urns show traces of food crust and soot, indicating household use before being buried with the deceased. This is also indicated by organic residue analysis conducted for one of the urns.

Some of the pottery was found outside of the burials. Those were either accidental, while collecting soil for burials, especially barrows, i.e., likely disturbing some earlier settlement area; or intentional – as a result of the burial rite or secondary funerary events.

The analysis of pottery techno-stylistics indicates that clay paste recipes followed general trends similar to household vessels, being medium coarse and with crushed granite temper, with few exceptions where quartzite and grog were determined; whereas they differed in profile shape and surface treatment. Unlike household vessels, burial pottery was dominantly curved (S, CS) and the surface smoothed, although other types were also distinguished. Ornamentation and plastic elements were not the dominant trend at all within burial pottery. In these few cases, pits were used to decorate the vessel, and line incisions and nail impressions also occur.

Analogies for some of the burial pottery can be traced to relatively nearby regions – Sambian peninsula and Scandinavia – indicating the transmission of knowledge, funerary practices and contacts between past societies in the Baltic Sea area.

IŠ VIDAUS IR IŠORĖS: RYTŲ BALTIJOS BRONZOS IR IKIROMĖNIŠKOJO GELEŽIES AMŽIAUS LAIDOJIMO KERAMIKOS KONTEKSTINĖ, MAKROSKOPINĖ IR MIKROSKOPINĖ ANALIZĖ

Vanda Haferberga, Joakim Wehlin, Uwe Sperling

Santrauka

Šis tyrimas yra skirtas keramikos, randamos laidojimo paminkluose Rytų Baltijos jūros regione, reikšmės ir technotipologinei analizei. Analizuojama medžiaga iš 13 kapinynų, datuojamų bronzos ir ikiromėniškuoju geležies amžiumi. Tipologiškai ištirti kapinynai suskirstyti į tris rūšis: plokštiniai kapinynai, pilkapynai ir vietovės su laivo formos akmeninėmis konstrukcijomis.

Keramika, rasta palaidojimuose, buvo analizuojama pagal kontekstą ir makroskopinius ypatumus, taip pat naudojant keramikos petrografiją. Šio tyrimo metu buvo paruošti ir išanalizuoti 14 keramikos mikrošlifų mėginiai.

Kapinynuose išskiriamos dvi keramikos rūšys: urnos ir įkapės. Urnos daugiausia naudotos degintiems palaikams. Nustatyta, kad palaidojimai urnose sutampa su pagrindinėmis griautinių ir degintinių laidojimų tradicijomis. Palaidojimų su urnomis atvejais urnos rastos akmeninių konstrukcijų viduje (cistose, „dėžutėse“) arba tiesiog užkastos duobėje. Keli kapai su urnomis turėjo pagrindą, grįstą akmenimis, ir (arba) buvo užstumti akmeniu. Indai kaip įkapės rasti tiek griautiniuose, tiek degintiniuose palaidojimuose. Degintiniuose kapuose rasti puodeliai ir vidutinio dydžio puodynės daugeliu atveju buvo padėti mirusiojo galvos srityje, regis, arčiau burnos. Tikėtina, kad šalia šių indų taip pat buvo dedamas maistas ir gėrimai, ir tai gali būti siejama su mirusiajam paliekamomis vaišėmis ar maisto atsargomis, skirtomis pomirtiniam gyvenimui. Tačiau beveik visais atvejais šio tipo indai rasti kape įrengtose akmeninėse struktūrose ir kiekviename

palaidojime įdėta tik po vieną tokį indą. Ant kai kurių urnų matyti maisto ir suodžių pėdsakų, liudijančių, kad jos naudotos buityje prieš palaidojant su mirusiuoju. Tai rodo ir rezultatai gauti atlikus vienos urnos organinių likučių analizę.

Kai kurie keramikos dirbiniai buvo rasti už kapo ribų. Tai gali būti arba atsitiktiniai atvejai, kai žemė kasta kitiems palaidojimams, ypač pilkapiams, t. y. greičiausiai suardžius ankstesnės gyvenvietės sluoksnius, arba tyčiniai – laidojimo apeigų ar antrinio laidojimo rezultatas.

Keramikos technostilistikos analizė rodo, kad keramikos, rastos palaidojimuose, masė iš esmės labai panaši į buitinių indų: vidutinio stambumo, su smulkinto granito liesikliu, išskyrus kelis atvejus, kai masėje buvo aptikta kvarcito ir senų molinių indų trupinių (dar vadinamo šamotu). Tačiau buitiniai ir laidojimo paminkluose rasti indai skiriasi profilio formomis ir paviršiaus apdorojimu. Skirtingai nei buitinių indų atveju, kapinynų keramikoje vyravo lenktos formos (S, CS) bei nugludintas paviršius. Tiesa, rasta ir kitų tipų keramikos. Taip pat pastebėta, kad keramika, rasta palaidojimuose, visiškai nepasižymėjo išskirtinais ornamentikos ir lipdytiniais akcentais. Keliais atvejais indo puošybai naudotos duobutės, taip pat pasitaikė tiesių įpjovimų ir nago įspaudų.

Kai kurių laidojimo paminkluose rastų indų analogų aptikta santykiškai gretimuose regionuose – Sambijos pusiasalyje ir Skandinavijoje. Tai rodo žinių, laidosenos ir kontaktų tarp senovės bendruomenių Baltijos jūros regione sklaidą.