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THE USE AND TREATMENT OF FRESHWATER MUSSELS IN THE NORTHEASTERN EUROPEAN LOWLANDS AND THE EASTERN BALTICS

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Freshwater shells appear repeatedly in animal bone assemblages at Late Bronze Age settlements. This is not only the case in the inland, but also in regions fairly close to the Baltic Sea shore. Significant amounts of freshwater mussels are known especially from Polish and Northeastern German fortified settlements as well as in the Lithuanian lowlands. Several large shell finds from Late Bronze Age fortified settlements in these regions have been published recently, shedding new light on the use of aquatic resources.

The majority of the freshwater mussels found belong to the Unio type, whose occurrence is particularly common in contexts of the Lusatian culture. Apparently, these mussels were intentionally selected for certain purposes. However, new excavations in Lithuania show that these selection processes can be observed over a much larger area than previously assumed. This article aims to present a brief overview of freshwater mussel gathering and consumption, analyzing such behavior in a wider context, with a focus on the consumption of mussels by Late Bronze Age communities in specific regions of Northeastern Europe. The significance of mussels as a resource is placed in a larger spatial context based on analogue finds.

Keywords: mussels, Late Bronze Age, fortified settlements, Northern Germany, Baltic region

Vėlyvojo bronzos amžiaus gyvenviečių archeozoologinėje medžiagoje gausiai aptinkama gėlavandenių midijų kriauklių. Taip yra ne tik žemyninėse dalyse, bet ir regionuose, esančiuose netoli Baltijos kranto. Nemažai jų randama Lenkijos ir Šiaurės Rytų Vokietijos įtvirtintose gyvenvietėse bei Lietuvos žemumose. Neseniai publikuoti vėlyvojo bronzos amžiaus įtvirtintų gyvenviečių moliuskų radiniai atskleidžia naujas vandens išteklių naudojimo galimybes.

Dauguma rastų gėlavandenių midijų priklauso Unio tipui, kurio paplitimas ypač dažnas Lužitėnų kultūroje. Šios midijos neabejotinai buvo tikslingai atrinktos ir turėjo skirtingą paskirtį. Nauji atradimai Lietuvoje rodo, kad šie atrankos procesai gali vykti kur kas didesniame regione, nei manyta anksčiau. Šio straipsnio tikslas – pateikti trumpą gėlavandenių midijų rinkimo ir vartojimo apžvalgą, analizuojant šį procesą platesniame kontekste, daugiausia dėmesio skiriant midijų vartojimui vėlyvojo bronzos amžiaus bendruomenėse Šiaurės Rytų Europos regionuose. Midijų, kaip maisto išteklių, reikšmė pateikiama platesniame erdviniame kontekste, remiantis analogiškais radiniais.

Reikšminiai žodžiai: midijos, vėlyvasis bronzos amžius, maisto vartojimas, įtvirtintos gyvenvietės, Baltijos regionas

INTRODUCTION

Marine shellfish has been consumed in coastal regions all over Europe, whereas freshwater shells for the most part were utilized inland. Publications that mention freshwater mussels from archaeological contexts are few and far between. It might be true, that mussels occur "… en masse in prehistoric

settlements" (Frank 1990, 65), but actual research concerning species, numbers, consumption and use is mostly lacking.

Given this situation, it is particularly interesting that at Late Bronze Age fortified settlements in Northeastern Europe, large accumulations of freshwater mussels have been repeatedly found in recent years. Among the more prominent examples are the settlements of Mineikiškės and Garniai 1 in Eastern Lithuania (Micelicaitė et al. 2023), Wrocław-Osobowce and Kamionka Nadbużna in Northern Poland (Ślusarska 2021, 181), the sites at Lanke (Nessel 2021; 2022; Nessel/Schopper 2023), and Lossow (Beilke-Voigt 2014) in Northeastern Germany (Fig. 1). The most dominant freshwater mussel is the Unio species, which is also the focus of this article. I present a brief overview of significant freshwater mussels finds from Late Bronze Age fortified settlements, and discuss similarities in find circumstances and deposition patterns.

Large assemblages of freshwater mussel remains were found at all mapped sites, and probably some more. The assemblages seemingly have a similar species composition possibly due to a comparable environment. However, the use of the natural resources differed significantly between various regions. A sedentary agricultural economy was adopted in the Northeastern German-Polish lowlands from 5200 till 3800 BC. However, agricultural societies coexisted with Mesolithic groups at least until the 4th millennium BC (Wetzel 2019). The introduction of agriculture had a large impact on the view of the food spectrum, especially when one considers that aquatic animals played an important role in human nutrition. Nonetheless, agriculture and livestock farming drastically reduced the proportion of aquatic resources in the diet (Benecke 1994; Bartosiewicz 2013).

It is therefore important to mention that recent studies suggest that crop agriculture came quite late to the Eastern Baltic, as the earliest cereal grains are dated to 1409–1229 cal BC. The implementation of these new techniques marked an important economic turning point for the region and occurred at the end of the Early Bronze Age and the beginning of the Late Bronze Age. A broad variety of crops and pulses in Lithuania is known from fortified settlements dated between 900–400 BC (Micelicaitė et al. 2023, 333). I.e., an intensive agriculture was only adopted in the early Late Bronze Age (Piličiauskas et al. 2021; Podėnas et al. 2023), and therefore the use of aquatic resources in the Bronze Age played over a longer period a much more important role in the Eastern Baltics than in regions where agricultural economy was adopted at an earlier time. The best-known example for a pre-agricultural site in the Eastern Baltic region is the sub-Neolithic settlement of Riņņukalns in Northern Latvia, where a large number of freshwater mollusks were deposited in a shell midden in the late 4th millennium BC (Rudzīte et al. 2012). Large quantities of mollusk remains were also found in the Neolithic settlements in Narva Riigiküla, as well as several settlements along the Narva River in Estonia (Bērziņš et al 2014). As in other European regions, there are far fewer studies on Bronze Age mussel utilization at eastern Baltic settlements than for the Neolithic period.

In addition to fish, shellfish (including crustaceans and mussels) were among the most consumed aquatic animals during the Late Bronze Age. In particular, freshwater mussels from rivers and lakes in inlands areas were easily accessible for nearby settlers and travelers. Against this background, the total number of excavated settlements with Bronze Age mussel finds is surprisingly low. In a previous paper, the author stated that the deposition of larger shell assemblages of freshwater mussels in fortified settlements is a phenomenon mainly limited to the central and eastern parts of Poland and the Northeastern German plain (Nessel et al. 2022, 78–79). However, new evidence from excavations

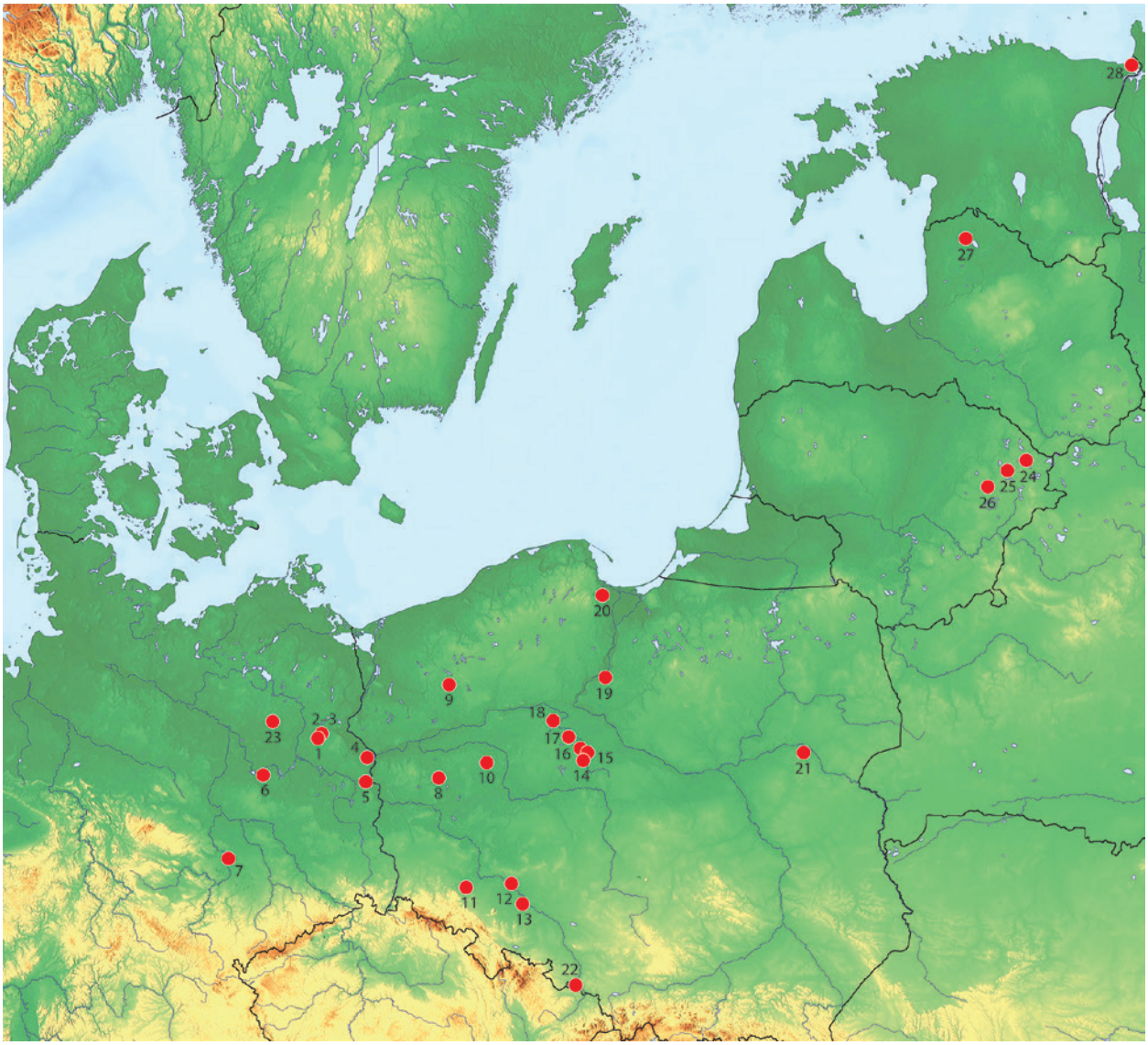

Fig. 1 Distribution of Late Bronze and Early Iron Age freshwater Unio mussels in settlements in Northeastern Germany, the Polish lowlands, and Lithuania and other sites mentioned in the text: 1 Lanke, 2 Finow, 3 Niederfinow, 4 Dolgelin, 5 Lossow, 6 Schmerzke, 7 Zauschwitz, 8 Lutol Mokry, 9 Nowy Łowicz, 10 Komorowo 1, 11 Grzybiany, 12 Wrocław-Osobowce, 13 Wojkowice, 14 Gacanowo, 15 Kruszwica 4/2, 16 Łagiewniki 5/7, 17 Jankowo, 18 Sobiejuchy 1, 19 Ruda 3, 20 Juszkowo, 21 Kamionka Nadbużna, 22 Będzin-Grodziec, 23 Karwe, 24, Mineikiškės, 25 Garniai, 26 Narkūnai, 27 Riņņukalns (neol. site), 28 Narva Riigiküla (neol. site).

1 pav. Vėlyvosios bronzos ir ankstyvojo geležies amžiaus gėlavandenių Unio midijų paplitimas Šiaurės Rytų Vokietijos, Lenkijos žemumų ir Lietuvos gyvenvietėse bei kitose tekste minėtose vietovėse: 1 Lanke, 2 Finow, 3 Niederfinow, 4 Dolgelin, 5 Lossow, 6 Schmerzke, 7 Zauschwitz, 8 Lutol Mokry, 9 Nowy Łowicz, 10 Komorowo 1, 11 Grzybiany, 12 Wrocław-Osobowce, 13 Wojkowice, 14 Gacanowo, 15 Kruszwica 4/2, 16 Łagiewniki 5/7, 17 Jankowo, 18 Sobiejuchy 1, 19 Ruda 3, 20 Juszkowo, 21 Kamionka-Nadbużna, 22 Będzin-Grodziec, 23 Karwe, 24, Mineikiškės, 25 Garniai, 26 Narkūnai, 27 Riņņukalns (neol. vietovė), 28 Narva Riigiküla (neol. vietovė).

point to similar consumption strategies, treatment, and use in settlements in the Eastern Baltic.

METHOD

This article is mainly based on published data from closed settlement contexts. It aims to compare known Late Bronze Age malacological materials, in particular mussels of the Unio species comparing how the mussels were treated. The starting point for this comparison is the mussels from the settlement of Lanke in northeastern Germany. The author excavated, recovered, and identified this malacological material using a comparative collection of mollusks and according to characteristics described by Zettler 2005 and Lundberg/Österling 2016. The comparison in this paper is based on the already published results (Nessel et al. 2022). However, for most finds in this study, it is certain that the entire malacological material was not recovered. For this reason, it is difficult to make precise comparisons about the treatment of the mussels from various sites. Different aims and excavation methods were implemented on the included sites, and the state of publication varies significantly. Thus, the mussel finds are not fully comparable and could not be subject to supra-regional statistics.

RECENT INVESTIGATIONS AND NEW FINDS

Recent investigations conducted at the fortified settlements of Garniai 1 and Mineikiškės (Micelicaitė et al. 2023, 334) show that freshwater mussels were valued, at least occasionally, in the inland Eastern Baltic region.

In the Garniai 1 settlement, only small mussel shell fragments remained, which were therefore not subjected to further analysis. More freshwater mollusks were found in the Late Bronze Age hillfort of Narkūnai, where also a significant amount of worked bone and antler artefacts was found (Volkaitė-Kulikauskienė 1986; Luik/Maldre 2007). Unfortunately, no information is given about the specific find circumstances of the mussels, which is why they cannot be dated accurately. The combination of large amounts of worked animal bones and large mussel assemblages is not only observable at the Garniai 1 settlement, but also present at Mineikiškės.

Excavations at the Mineikiškės fortified settlement were carried out between 2017 and 2020. Besides a large bone and antler assemblage, 500 mollusks remains were discovered. Currently, not much is known about their specific context, but the fact that almost all mollusks were found during the 2020 campaign, indicates a find concentration in a certain area in the southern part of the settlement. Unfortunately, many mussels where not recovered due to a poor state of preservation. The rest of the animal bone assemblage is essentially comparable with similar findings at other Northern European Late Bronze Age sites, in that they mostly consisted of bones from domestic animals such as cattle and horses. Several AMS-dates from grains and charcoal date this settlement to a period between 983 to 388 cal BC (Podėnas et al. 2023; Minkevičius 2023).

Excavations in Northern Germany during 2021 also found large quantities of mussels in the southern part of the Late Bronze Age settlement at Lanke, where a mussel cache was located in a settlement pit under the floor of a building. The settlement is located on a naturally fortified plateau, which overlooks its surroundings by approximately five meters. There is a lake to the south, where the mussels most probably were collected. The find contained 327 freshwater mussel shell halves, which were excavated and investigated by the author. The shells were tightly packed in the southwestern part of the pit and carefully deposited therein, whereby smaller shells were placed in larger ones (Fig. 2).

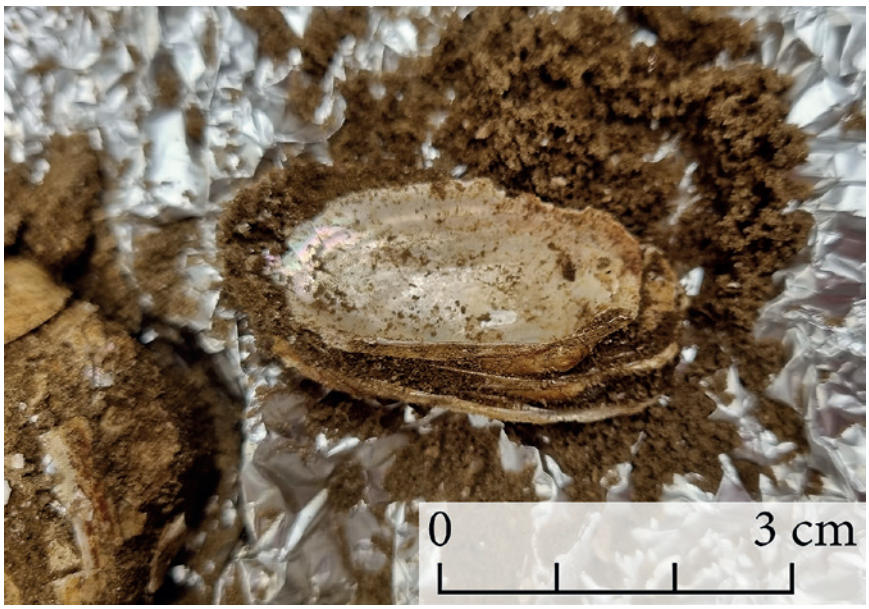

Fig. 2. Three tightly packed clams with overlapping silhouettes from the Lanke find. *Photo by B. Nessel.*
2 pav. Trys glaudžiai suspausti moliuskai su persidengiančiais siluetais iš Lanke. *B. Nessel nuotrauka.*

Associated pottery fragments and 14C-analyses from charcoal shows that the mussels were deposited between 1200 and 1050 BC (Nessel et al. 2022, 72).

SPECIES

From the 500 mollusk remains found at Mineikiškės, only 57 were identified by species. 49 of them belong to Unio crassus, while the remaining eight shells could be identified as Unio tumidus. Both types mostly live in slow-flowing rivers and lakes. In the case of the Mineikiškės settlement, it is assumed that the mussels there were collected from the near Nikajus river (Micelicaitė et al. 2023, 342). Unfortunately, there are no analyses available for the mussels from the Garniai 1 and Narkūnai settlement sites.

Even for the well-preserved mussels from the Lanke settlement, due to fragmentation, the exact number of halves could not be estimated. Only 18 mussels had two shell halves, in two cases, the shells lay on top of each other in an anatomically correct position (Nessel et al. 2022, 72). The identifiable specimens belong to different types of Anadontini and Unionidae, namely Unio crassus, Unio tumidus, Unio pictorum, Anodonta and Pseudanodonta complanata. Most of the mussels belong to Unio pictorum. The mentioned neolithic Riņņukalns settlement predates the others by far, but analyses from bulk samples from that site showed similar types of freshwater mussels were chosen and collected. Although the exact number of freshwater mussels cannot be estimated for sure, but they belong to Unio tumidus, Unio pictorum, Anodonta cygnea and Anodonta anatina (Rudzīte et al. 2012, 49. 51–52). Mussels of Unio spp. are again most common (Rudzīte et al. 2012, 51–52).

Unio mussels have a complex reproduction circle and are in need of a specific environment to build stable populations. Good chances of survival

are only found in sandy sediments with a sufficient flow of oxygenated water. In larger streams or rivers, the mussels often prefer riparian zones. There the root systems of deciduous trees create suitable microhabitats for them and their specific host fish species. Today, Unio mussels are endangered in most parts of Europe because they strongly depend on good water quality and are adversely affected by water pollution (Pilotprojekt 2007, 30).

CONSUMPTION AND USE

Archaeological evidence of mussel consumption consist of finds of shells, which means that only a part of the animal is preserved. Thus, the actual importance of freshwater mussels as a daily dietary item, or any alternate purpose for that matter, is often difficult to assess because further use and treatment of the flesh can only be assumed at best.

In contrast to marine mussels, most types of freshwater mussels have small and thin shells and are therefore much less suitable for use as tools or vessels. Our view is even more clouded by the often poor state of preservation. Some species such as Anadontini, have very low chances of being preserved for thousands of years due to their very thin and fragile shells. In comparison to Anadonta spp., the Unio spp. mussels have rather thick shells, which might be a reason why they are found much more frequently than other species. Detailed information about freshwater mussel find circumstances is still rare, and it is likely that several finds are unreported.

Despite these limitations, the consumption of freshwater mussels is well documented through finds, particularly in the Late Bronze Age Lusatian culture, where they are mostly found in larger fortified settlements (Ślusarska 2021). From this, it seems evident that the mode of mussel consumption in the Northeastern German-Polish lowlands differed from societies in Southern Scandinavia, where large finds of freshwater mussels are absent at Late Bronze Age settlements. The neolithic tradition to pile up large heaps of marine and freshwater shells in or near settlements (Benecke 1994, 44; Milner et al. 2007) does not occur in the Late Bronze Age. The further south one looks, the smaller the shell finds in Late Bronze Age settlements become. Compared to the situations in the Northeastern German-Polish lowlands and Southern Scandinavia, Urnfield Culture settlements usually have very limited amounts of freshwater mussel shells (???), which cannot be explained by a lack of access to freshwater mussels in regions such as Southern Germany or Austria.

The condition of freshwater mussels found at archaeological sites varied significantly. The finds from the Lanke settlement are a very good example for this, as they demonstrated that mussels were treated and prepared in different ways. A part of the mussels from Lanke shows characteristic breakage patterns on the rear end of the shells, while others were left completely intact without any traces of manipulation (Nessel et al. 2022, 74–75).

Similar breakage patterns are observable on the mussel shells from Mineikiškės. Shells that are complete, broken in half, or with roughly a third broken off at the rear end of the mussel body, were also present (Fig. 3). The type of breakage in the rear part of the shells, or directly at their upper opening, indicates that the mussels were forcibly opened and consumed raw (Aldeias et al. 2019, 390).

However, due to their muddy habitat, freshwater mussels usually have a corresponding flavor that distinguishes them from seashell species. The muddy taste can be mitigated by keeping the animals in clean water for a few days. A similar partially mitigating effect may be achieved by boiling the mussels (Falkner 1969, 127).

But these breakage patterns do not necessarily imply that they were eaten raw by humans. Freshwater mussels can just as easily be used as bait for fishing (Pickard et al. 2017, 184–185; Mougne

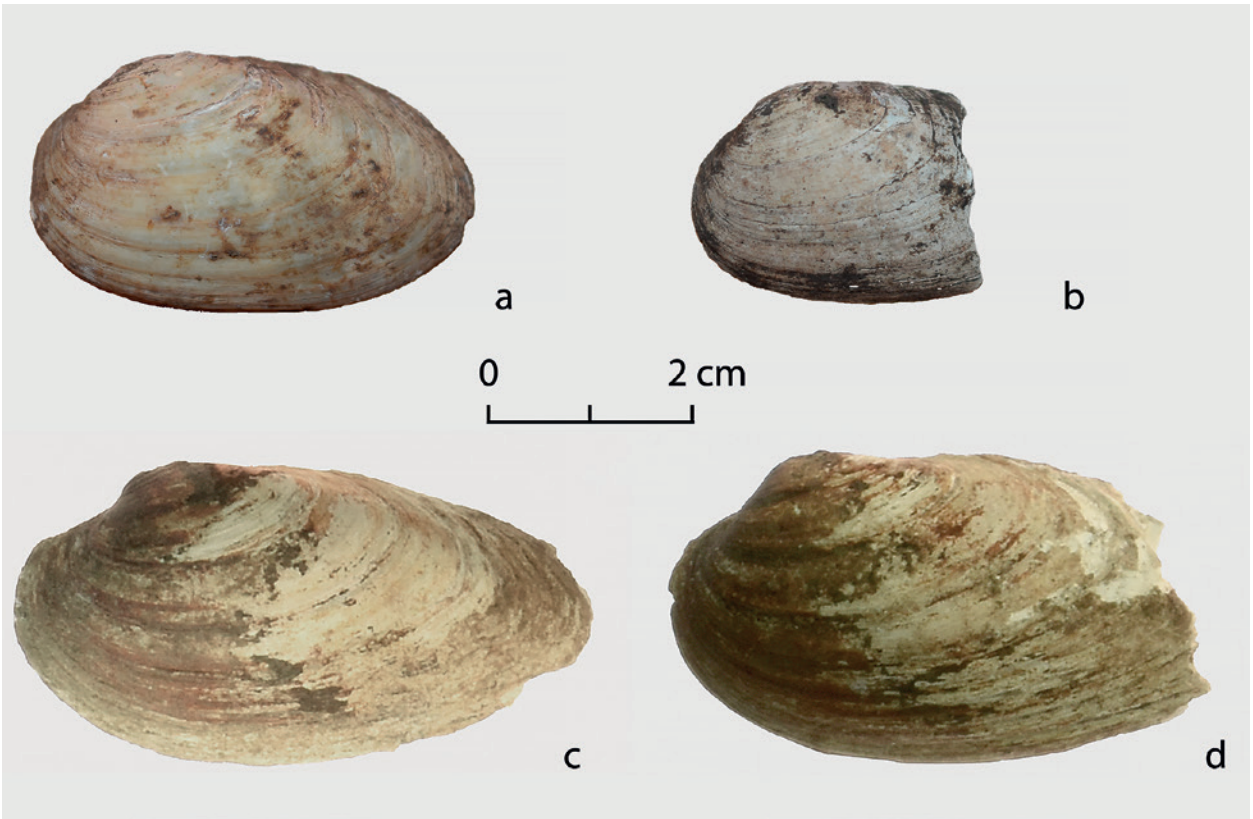

Fig. 3 Clams with similar breakage patterns: a-b) Unio crassus and Unio tumidus from Mineikiškės (after Micelicaitė et al. 2023, Fig. 2); c-b) Unio pictorum and Unio crassus from Lanke. *Photos by B. Nessel.*
4 pav. Moliuskai su panašiais lūžių požymiais: a-b) Unio crassus ir Unio tumidus iš Mineikiškių (pagal Micelicaitė et al. 2023, 2 pav.); c-b) Unio pictorum ir Unio crassus iš Lanke. *B. Nessel nuotraukos.*

et al. 2014), or as food for domestic animals such as pigs or turtles. Their use as fishing bait, in particular, often entails fracturing the rear end of the mussel body. In addition, the preparation or use of shells as tools may also explain the corresponding breakage patterns (Falkner 1969, 127).

On the other hand, numerous shells of the mussels from Lanke were well preserved and had clean(ed) shells (Nessel et al. 2022, 78). These mussels were more likely boiled. The likelihood that clean mussels were actually boiled increases when several shells with such traces occur together (Falkner 1969, 131; Frank 1990, 188). Yet, it remains possible that they were cleaned for different reasons.

As aforementioned, the mussel find from the Lanke settlement also contained two mussels, which did not open during treatment and remained in an anatomically correct alignment. These two specimens were deposited together with all other consumed mussel shells. They were likely already dead and did not open when they were cooked. Therefore, we may conclude that in Lanke mussels were, at least in part, cooked and not eaten raw.

Other mussels from the find show strong, oblique staining on the outside shells, which most likely derives from the sediment they lived in. Since these mussels also have no traces of burning, they might have been dried in the sun until they opened.

Experiments have shown that it is more effective to dry shellfish in the shell. Besides smoking and pickling, this is an effective method to preserve shellfish for rehydration and boiling at a later point (Mougne et al. 2014).

Although none of the mussels from Lanke had traces of burning, mussels from other settlements do occasionally show these signs. Freshwater mussel shells are sometimes found in or close to cooking pits, such as in the settlement of Kamionka Nadbuzna (Ślusarska 2021, 181), making it likely that some were exposed to fire. When used as a source of nutrition, they were either boiled in vessels on a hearth, roasted directly in hot ashes next to a fire (Falkner 1969, 131), or cooked on hot stones (Mougne et al. 2014; Aldeias et al. 2019). We cannot determine whether some of the mussels from Mineikiškės or the other settlements in Lithuania were roasted.

Shells were also used for other purposes such as tempering clay vessels (Pickard et al. 2017, 187). They reduced the susceptibility to cracking and increased the temperature resistance of clay products (Eramo 2020, 164). Some of the pottery of Mineikiškės is indeed tempered with mussel shells; however, it is not analyzed if certain species, or any shells, were used for pottery tempering. As the material from Riņņukalns shows, this tradition was established at least in Neolithic times, if not earlier, in the Eastern Baltic region, where a large proportion of the pottery is shell-tempered (Rudzīte et al. 2012, 55). On the other hand, shell temper in the territories of Lusatian culture was uncommon in the Late Bronze Age for reasons that are yet to be fully understood.

Most European freshwater mussels have rather small and thin shells. Nevertheless, there is evidence that the shells were used before and after consumption to make tools for certain activities such as fur and clay processing (Falkner 1969, 133). Shells of Unio spp. were also worn as jewelry, e.g., in the form of pendants with one or two perforations. But such perforations are not frequently observed in the Late Bronze Age in the Northern German-Polish lowlands or in the Eastern Baltic region. The use of Unio shells as tools for decorating ceramic surfaces, that was documented in a Neolithic settlement in Ukraine (Motuzaite Matuzeviciute 2012, 14), is not observed in the Late Bronze Age of Northeastern Europe.

CONTEXTUALIZATION OF FRESHWATER MOLLUSKS ASSEMBLAGES

Larger finds of freshwater mollusk remains are rare in Late Bronze Age zooarchaeological assemblages. This applies to the German-Polish lowlands and the Eastern Baltic region alike. At Mineikiškės, mollusks account for only 6.2% of the analyzed zooarchaeological material (Luik et al. 2022, 240). The mussels found there are interpreted as an additional source of protein in times of food shortage, which is generally the most common assumption for this type of food (Micelicaitė et al. 2023, 340; Mannino/Thomas 2002).

The dietary patterns of communities reflect their subsistence, economy, and livelihood. At the Mineikiškės settlement and in Lusatian Culture settlements, almost all animal bones belong to domesticated species. The small number of wild animals present in the bone assemblages (Micelicaitė et al. 2023, 340) points to a minor role in hunting. A similar economy based almost entirely on domestic animals can be observed in the bone assemblages from most Late Bronze Age settlements in the German-Polish lowlands (Bartosiewicz 2013).

Nonetheless, it remains surprising that the settlements of Mineikiškės, Garnai 1, and Narkūnai are the first Lithuania settlements where mollusk remains were found in large quantities. In fact, almost all fifty known fortified settlements are located close to rivers and/or lakes (Fig. 4). As such, it is unclear why those communities would not have

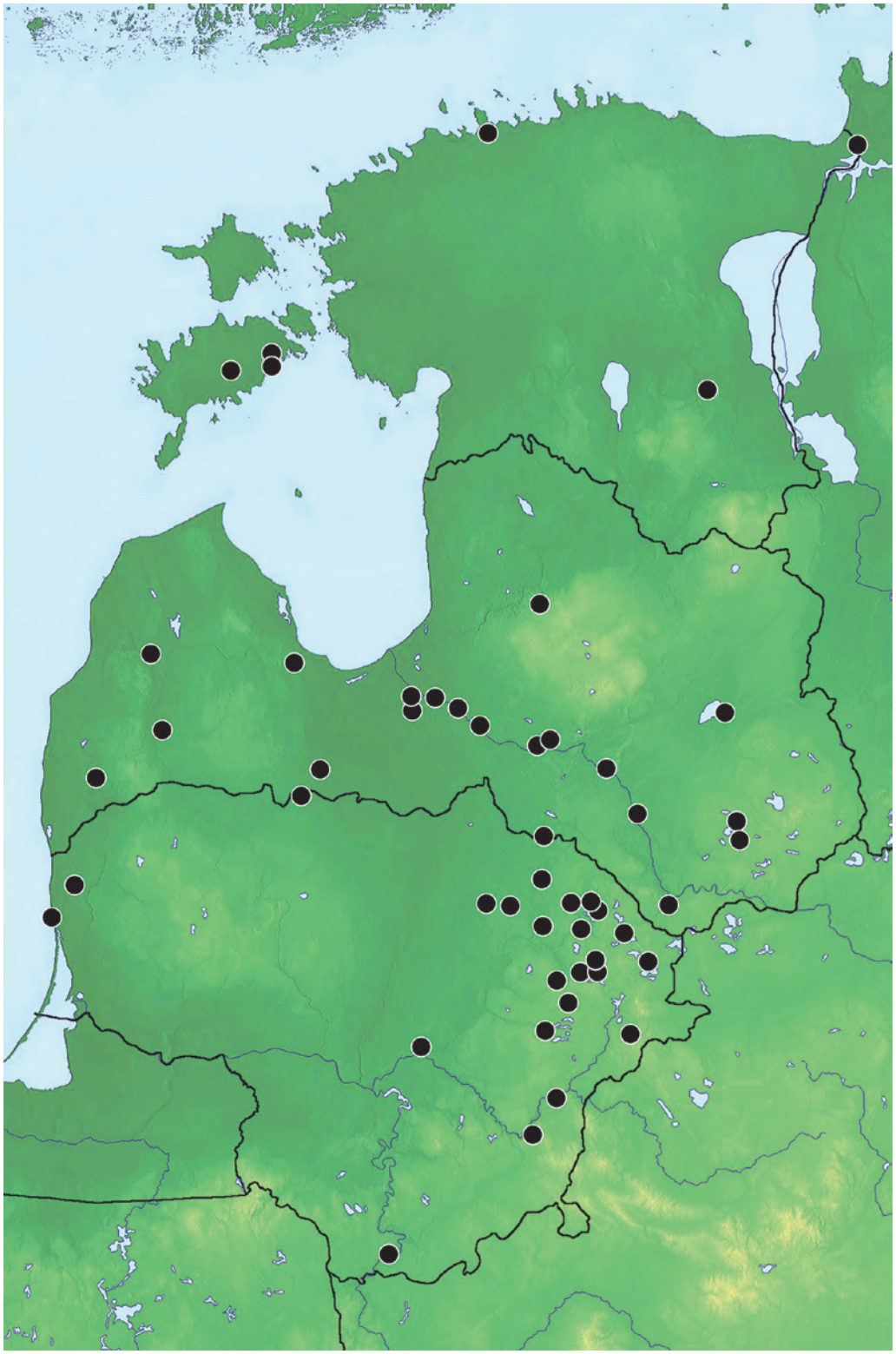

Fig. 4 Fortified settlements in the Eastern Baltic region (after Čivilytė et al. 2022, Fig. 1)
4 pav. Rytų Baltijos regiono įtvirtintos gyvenvietės (pagal Čivilytė et al. 2022, Fig. 1).

used mussels as a resource on a large scale. Although new investigations may alter our understanding, a significant amount of archaeological research has already been conducted (Podėnas et al. 2022), and we witness a similar situation on the German-Polish lowlands.

Considering that freshwater mussels were used for different purposes, specimens of Unio spp. seem to have been deliberately chosen since almost all freshwater shells found at the mentioned sites are of this species. Although the same does not generally hold for Neolithic settlements, Rudzīte and colleagues came to a similar conclusion for the Unio spp. remains at Riņņukalns (Rudzīte 2012, 52).

In contrast, similar looking but larger species such as Margaritana margaritifera ("Mother of Pearl") are hardly ever found in Late Bronze Age settlement contexts (e.g., Teichert 1964, 858; Müller 1975, 178). But their presence in Late Bronze Age graves (Simon 1972, 21–39, 80, 85, 87; Simon/Franz 1978, 76. 81. 87; Metzner-Nebelsick 2023), it may be assumed that certain shell types were deliberately selected to fulfil certain requirements. This indicates that the Late Bronze Age populations were extensively familiar with mussels as a natural resource (Teichert 1964, 858; Müller 1975, 178).

RESULTS

The following may be observed from the results of settlement excavations in Northern Germany, Poland, and the Eastern Baltic region:

1. As a resource, freshwater mussels was seemingly subject to regional preferences. For some settlements, even whole regions such as Eastern Poland and central Lithuania (see Fig. 1), there is no evidence of mussel consumption in the Late Bronze Age. On the other hand, on sites where freshwater mussels appear, they were either used occasionally or could have been regularly used, both as a resource and nutritional item, despite its relatively low energy content when compared to other types of meat or even plant-based food (Parmalee/Klippel 1974, 432–433). Conversely, large quantities of mussels were obtainable with little effort and time, and did not require specific preparation or skills. Additionally, they are among the most productive meats for ingesting and synthesizing complete proteins (Erdlandson 1988, 103).

2. Shells are generally found much more often in fortified settlements than at rural sites, although they are more commonly found in the latter. This may partly be due to research foci, but may, on the other hand, also be linked to specific social groups given that a smaller part of a society lived in fortified settlements (Nessel al. 2022, 78–79).

However, the rather low number of freshwater mussels at most Late Bronze Age fortified settlements also indicates that the animals were not a regular part of the locals' daily diets. There are no shellfish remains at numerous settlements despite their proximity to rivers or lakes (Fig. 4), although the animal bone material often shows that fish was frequently consumed. From this, it can be derived that aquatic resources were a regular component of everyday life, but specific mussel species were collected for different purposes.

3. Ethnological observations indicate that freshwater mussels were often part of the diets of less well-off households in the recent past (Falkner 1969, 126–127). However, this does not necessarily apply to Late Bronze Age communities. We often lack sufficient information regarding the investigated settlements and communities to estimate their organizational structure, which is the case for all of the aforementioned settlements. Evaluating the same in the Eastern Baltic region is even more difficult since the reason(s) for fortifying many of those settlements remains debatable (e.g., Čivilytė 2012; Lang 2018). Nevertheless, Late Bronze Age freshwater shell finds usually contain leftovers of a single event. Hence, it is difficult to conclude that

freshwater mussels were consumed on a constant basis, and should not just be regarded as a food supplement in times of need. On the contrary, regarding freshwater mussels as a special food that was only consumed on certain occasions is more concomitant with most archaeological finds.

It should be noted that freshwater mussels, especially the Unio spp., were treated and used in different ways. They may have had a special value and cannot be considered part of the everyday diet. They were, however, preferred to other freshwater mussel species.

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GĖLAVANDENIŲ MIDIJŲ NAUDOJIMAS IR APDOROJIMAS ŠIAURĖS RYTŲ EUROPOS ŽEMUMOSE IR RYTŲ BALTIJOS REGIONE

BIANKA NESSEL

Santrauka

Keliose vėlyvojo bronzos amžiaus įtvirtintose gyvenvietėse Šiaurės Rytų Europoje rasta po kelis šimtus gėlavandenių midijų kriauklių. Dažniausiai tai kriauklės su būdingais lūžio požymiais, tačiau kartais pasitaiko visiškai sveiki egzemplioriai. Kai kuriose vietose jie buvo labai kruopščiai apdoroti. Veikiausiai midijų kriauklių sankaupos yra didesnių žmonių grupių valgių liekanos, kitos galėjo būti naudojamos kaip pašaras naminiams gyvūnams ar masalas žvejybai. Rytų Baltijos regione midijų kriauklėmis buvo liesinama keramika, o tai neįprasta Lužitėnų kultūrai. Skirtingose gyvenvietėse kriauklės neabejotinai buvo apdorojamos ir naudojamos įvairiais būdais. Vienos jų buvo verdamos ir valgomos, kitos tikriausiai džiovinamos ir galbūt konservuojamos. Midijos galėjo būti valgomos ištisus metus, tačiau toks vartojimas galėjo būti nulemtas mitybos įpročių ir (arba) tam tikrų socialinių grupių maisto pomėgių. Vėlyvajame bronzos amžiuje gėlavandenės midijos buvo vartojamos dideliame geografiniame regione. Jos nebuvo skirtos tik maisto papildymui deficito laikotarpiu. Šiandien dar negalima nustatyti, kokia buvo tikroji gėlavandenių midijų svarba daugeliui bendruomenių, tačiau tai yra palanki dirva ateities tyrimams.

THE USE AND TREATMENT OF FRESHWATER MUSSELS IN THE NORTHEASTERN EUROPEAN LOWLANDS AND THE EASTERN BALTICS

BIANKA NESSEL

Summary

Large accumulations of freshwater mussels were recently found in several Late Bronze Age fortified settlements in Northeastern Europe. The finds, each containing several hundred freshwater mussels, mostly consist of shells with characteristic breakage patterns and sometimes even completely intact specimens. At some sites, they were treated very carefully. Some ensembles most likely represent the remains of meals for larger groups of people, others may have been used as fodder for domestic animals or bait.

In the Eastern Baltic region, pottery was also tempered with mussel shells, which is in contrast uncommon in the Northeastern German-Polish lowlands, belonging to the Lusatian territories. Shells in different settlements were certainly treated and utilized in several different ways; some were cooked and eaten and others were probably dried and possibly preserved. Mussels may have been eaten throughout the year – such consumption, however, may be the product of preferences and/or certain social groups. In the Northeastern German-Polish lowlands, mussels were mostly found in bigger Late Bronze Age fortified settlements, which were often of regional importance. For the Eastern Baltic region, this can only be evaluated when further excavation reports are published. Yet, the actual importance of freshwater mussels to many communities cannot be determined at present, but represents fertile grounds for future research.