Stone Age Research in the Narva–Luga Klint Bay Area in 2005–2014

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Abstract

The Narva–Luga micro-region, situated on the border of Estonia and Russia in north-eastern Europe, has been the target of international and interdisciplinary research conducted annually between 2005 and 2014. During this time, altogether 42 new archaeological sites have been discovered, and many sites have also been excavated – in addition, a large amount of natural scientific data has been collected. All in all, over 60 Stone Age and Bronze Age sites are currently known in this micro-region. The sites date mostly between the late 6th and late 3rd millennia calBC, that is, to the cultural contexts of Narva Ware, Comb Ware, and Corded Ware. In this paper, some of the main results of the archaeological studies made during the last decade are briefly summarised.

1 Introduction

The Narva–Luga micro-region is located on the south-eastern coast of the Gulf of Finland of the Baltic Sea, in the Estonian–Russian border area. It is named after the two major rivers –Narva and Luga – cutting through the research area, which occupies the territory of the geologically old Klint Bay (Fig. 1). The region consists of two main landscape areas: the northern coastal lowlands, dominated by marine and fluvial sediments, are sharply contoured to the south and east by a plateau formed by the Cambrian/Ordovician Baltic Klint. During much of the Holocene, transgressions and regressions of the Baltic Sea, which were caused by glacio-isostatic land uplift and eustatic changes of the sea level, were a central factor in shaping the environment. They affected specifically the coastal lowlands, which were characterised by extensive lagoonal systems during most of the Neolithic – towards the end of the period and

the Early Bronze Age the lagoons were overgrown and the natural environment took a different appearance (for a detailed hydrological and geological history, see Rosentau et al. 2013).

The first Stone Age sites and intriguing stray finds (including the remains of a fishnet) were discovered already in the 1930s and 1940s in the Narva–Luga Klint Bay area (Indreko 1932; 1948). In the 1950s, 1960s, and 1980s, large-scale excavations were carried out on the Estonian side of the border (Efendiyev 1983; Gurina 1967; Jaanits 1955; 1965; for a detailed research history until 1995, see Kriiska 1996a). A new phase of intensive research started in the 1990s and has been going on until the present day (Kriiska 1995a; 1996b; 1999; 2000; Kriiska & Nordqvist 2007; 2010; 2012; Kriiska & Rappu 2008; Kriiska et al. 2015a; 2015b). In the area on the Russian side of the border, part of which belonged to the Estonian Republic until 1940, archaeological activities have been more modest. However, some surveys and excavations were conducted in the area during the 20th century (Gurina 1961; Indreko 1948; Moora 1957; Petrenko & Efendiyev 1985). In 2005, research intensified also on Russian territory, when the studies done in Estonia were extended to the east in order to obtain a comprehensive investigation of the whole geographical micro-region.

Within the last ten years, research has been conducted annually in the Narva–Luga region by an international crew of scholars from Russia, Estonia, and Finland. In addition to archaeologists, a multitude of specialists from different fields of the natural sciences, including geology, marine geology, limnology, palaeogeography, geomorphology, geochemistry, palynology, and geophysics, have taken part in the studies (Fig. 2). The research done so far has consisted of modern archaeological surveys and (small-scale) excavations (Gerasimov et al. 2012; 2013; Kriiska et al. 2015a; 2015b), as well as various kinds of geological and palaeoecological mapping and sampling (Rosentau et al. 2013; Tšugai et al. 2014). At the time of writing, many analyses are still under way. These include some of the palaeoecological studies, but also analyses of lipids, starch, and phytolites on pottery sherds, as well as the macrofossil analyses of excavated sites. The results of these studies can be expected to come out in the near future.

As a result, over 60 Stone Age and Bronze Age settlement sites are known in the research area. This figure includes the new sites found in 2005–2014 as well as all the previously known sites, which were all inspected during our fieldwork. In addition, a large amount of natural scientific data has been collected. In this paper, we present some of the main results of the archaeological studies made in the area between 2005 and 2014. The treatment, admittedly, remains on a highly descriptive and superficial level, and detailed presentations of the materials, their analyses, interpretations, and contextualisations are left for forthcoming publications.

2 Results

2.1 General description

The results unquestionably show that the Narva–Luga micro-region was densely inhabited at least throughout the later part of the Stone Age, from the Late Mesolithic / Early Neolithic to the Late Neolithic / Early Bronze Age, depending on the preferred periodisation.[1] The 42 settlement sites and one burial ground found in our studies date to the interval 5200–2000 calBC (Fig. 1; Table 1). However, earlier research has revealed also signs of habitation during the pre-ceramic period, dating from 6500 calBC onwards, and some stray finds discovered in buried soil layers on the lowlands also derive from the Mesolithic Stone Age (Indreko 1932; Jaanits et al. 1982: 43–47; Kriiska & Gerasimov 2014: 9–10; Moora 1957; Rosentau et al. 2013: Fig. 5). At this point, it must also be noted that our studies have predominantly focused on the coastal lowlands, which can be assumed to have witnessed much of the Stone Age and Early Bronze Age settlement activities (also elsewhere on the Estonian northern coast, Stone Age habitation has mostly been recorded in the

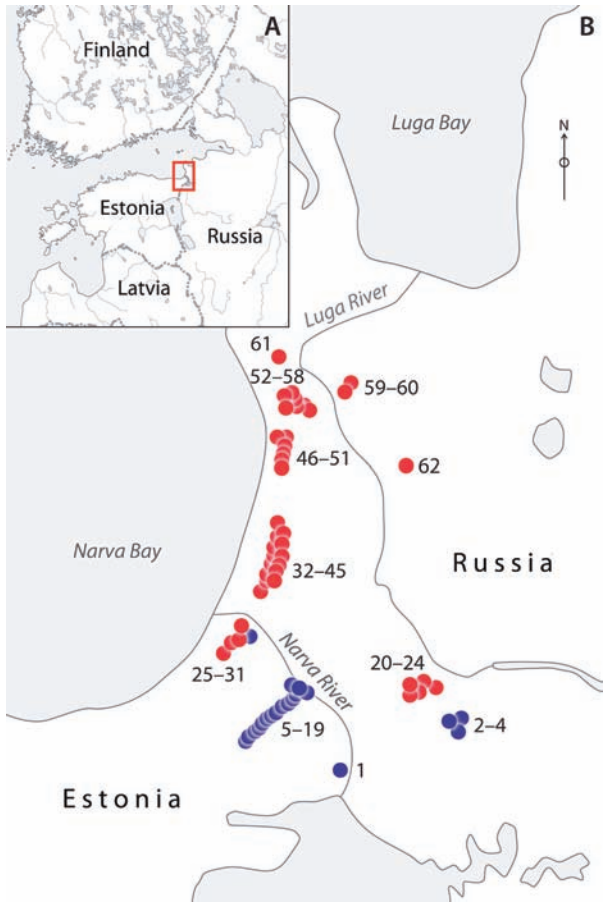


Figure 1. The location of the Narva–Luga interfluve in the eastern Baltic Sea region (A), and the currently known Stone Age and Early Bronze Age sites in this area (B). Sites: 1 – Narva Joaorg; 2–4 – Lommi I, II, and III; 5–19 – Riigiküla I, II, III, IV, V, VI, VII, VIII, IX, X, XI, XII, XII, XIV, and XV; 20–24 – Izvoz 2, 3, 4, 5, and 6; 25–31 – Narva-Jõesuu I, IIa, IIb, III, IV, Viljapea, and Kudruküla; 32–45 – Rosson 1, 2, 3, 4, 5, 6, 7, 8, 8b, 9, 10, 12, 15, and 16; 46–51 – Väike-Ropsu 1, 2, 3, 4, 5, and 6; 52–58 – Kuzemkino 1, 2, 3, 4, 5, 6, and 7; 59–60 – Galik 3 and 4; 61 – Strupovo; 62 – Kurovitsy. Sites known before 2005 marked in blue, sites located within the present studies shown in red. Map: the authors.

Figure 2. Examples of the variety of methods employed in the studies: sediment samples for palaeoenvironmental research are cored near the Rosson settlement site cluster (left), and the area of the possible Corded Ware cemetery is studied through GPR survey at Narva-Jõesuu (right). Photos: K. Nordqvist.

No	Site	Found	Excavations	Pottery	^{14}C date (BP)	Lab-index	Reference for the dating
1	Viljapea	2005	-	CW	4315±30	Poz-59063	This study
2	Narva-Jõesuu I	2008	2009	CW, CoW	-	-	
3	Narva-Jõesuu IIa	2009	2010	CW, CoW	4557±34 ; 3931±35	Hela-2741; Hela-2740	Kriiska & Nordqvist 2012; Rosentau et al. 2013: Table 2
4	Narva-Jõesuu IIb	2009	2011–2014	CW, CoW	4500±35; 4215±35; 3755±30	Poz-58915; Poz-58913; Poz-58914	Kriiska et al. 2015; this study
5	Narva-Jõesuu III	2009	-	CW, CoW	-	-	
6	Narva-Jõesuu IV	2009	-	CW, CoW	-	-	
7	Kuzemkino 1	2005	-	NW	5090±40	Hela-1945	Gerasimov et al. 2012: 246
8	Kuzemkino 2	2005	-	NW	-	-	
9	Kuzemkino 3	2010	-	-	-	-	
10	Kuzemkino 4	2014	-	NW	-	-	
11	Kuzemkino 5	2014	-	NW	-	-	
12	Kuzemkino 6	2014	-	NW	-	-	
13	Kuzemkino 7	2014	-	CW	-	-	
14	Izvoz 2	2006	2008	NW, CW	6212±48	Hela-2742	Rosentau et al. 2013: Table 2
15	Izvoz 3	2006	2012	CW	-	-	
16	Izvoz 4	2007	-	CW	-	-	
17	Izvoz 5	2007	-	CW	-	-	
18	Izvoz 6	2007	-	CW	-	-	
19	Galik 3	2006	-	NW	5442±45	Hela-2743	Rosentau et al. 2013: Table 2
20	Galik 4	2006	-	CW	-	-	
21	Kurovitsy	2006	-	CW	-	-	
22	Strupovo	2010	-	-	-	-	
23	Väike-Ropsu 1	2010	-	CoW	3607±31	Hela-2516	Rosentau et al. 2013: Table 2
24	Väike-Ropsu 2	2010	-	CW	-	-	
25	Väike-Ropsu 3	2010	-	CW	-	-	
26	Väike-Ropsu 4	2010	-	CW	-	-	
27	Väike-Ropsu 5	2010	-	NW	-	-	
28	Väike-Ropsu 6	2013	-	CoW	-	-	
29	Rosson 1	2011	-	CW, CoW	3725±40	Hela-2744	Rosentau et al. 2013: Table 2
30	Rosson 2	2011	-	CoW	-	-	
31	Rosson 3	2011	-	CoW	-	-	
32	Rosson 4	2012	-	CoW	-	-	
33	Rosson 5	2012	-	CW, CoW	-	-	
34	Rosson 6	2012	-	CW	-	-	
35	Rosson 7	2012	-	CW, CoW	-	-	
36	Rosson 8	2012	-	CoW	-	-	
37	Rosson 8b	2012	-	CoW	-	-	
38	Rosson 9	2012	-	CW, CoW	-	-	
39	Rosson 10	2013	-	CoW	-	-	
40	Rosson 12	2013	-	CoW	-	-	
41	Rosson 15	2013	-	CW	-	-	
42	Rosson 16	2013	-	CW	-	-	

Table 1. Stone Age sites found in the Narva–Luga micro-region in 2005–2014. NW – Narva Ware; CW – Comb Ware; CoW – Corded Ware.

Figure 3. Archaeology aficionados of the *Ango* association participating in the excavations at the settlement sites of Narva-Jõesuu IIb (left) and Rosson 9 (right). Photos: K. Nordqvist.

zone between the Klint and the seashore; e.g. Kadakas et al. 2010; Kriiska et al. 2009). Areas on top of the plateau (the Klint) have been meagrely studied and exhibit individual sites and finds only.

In the studies conducted during the last decade, find materials belonging to all three early ceramic complexes, typical for the eastern Baltic Sea area, are present: Narva Ware (dated in Estonia and western Russia ca. 5500–3900 calBC), Comb Ware (ca. 4000–2000 calBC), and Corded Ware (ca. 2800–2000 calBC). In addition, also finds of later periods (Iron Age and historical era) have been recorded and investigated.

The general trends of the Stone Age in the Narva–Luga micro-region were partially outlined already in the studies made in the Narva area between the 1950s and the 1990s. However, the settlements and burials discovered during the recent fieldwork allow considerably more detailed and diverse investigation of prehistoric habitation and land use – studies of settlement, subsistence, material culture and technology, as well as spiritual culture and contacts. Also more accurate chronologies can be constructed by combining the information from radiometric datings of archaeological materials with the palaeoecological data. Further, the Narva–Luga region was not unique in terms of its environmental settings, and corresponding lagoonal systems existed during that time also elsewhere in the eastern Baltic Sea area, including the areas of Sindi-Lodja, Lavassaare, and Tolkuse in south-western Estonia (e.g. Kriiska & Lõugas 2009; Rosentau et al. 2009), and, to some extent, the territory of present-day St Petersburg and Sestroretsk in the eastern Gulf of Finland (Gusentsova & Sorokin 2012: 184–185; Kulkova et al. 2014). Therefore, the meticulous research carried out in the micro-region provides material for producing predictive models for other coastal areas of the Baltic Sea, too. In addition, the current studies have also confirmed many old interpretations, which, at their time, were based on scarce material.

The Narva–Luga area is one of the most thoroughly studied micro-regions in Estonia and north-west Russia: it has been extensively surveyed, and also relatively many excavations have been conducted. The level of detail can, in fact, be presented as one of the essential points of the research described in this paper. Another central achievement is the seamless and recip-

Figure 4. Riigiküla VI, a settlement site of the Narva Ware period, was excavated in 2007–2008. Photo: A. Kriiska.

rocal combination of various fields of research with archaeological studies. This cooperation has resulted in well-founded palaeogeographical models, which allow not only the accurate monitoring of long-term changes in the natural environment, but also the study of contemporary developments in human activities and land use patterns in relation to these changes. All of the above forms a good basis for future research: the addition of new, well-dated sites and finds into the existing data will further refine the detail of our models, and, thus, further clarify the image of the past in the Narva–Luga area.

In addition to scientific goals, the popularisation of research has played a considerable role in our work. Public archaeology has been very prominent especially on the Estonian side, but also in Russia. Laymen, particularly Finnish archaeology enthusiasts, have also taken part in the excavations annually over the last decade (Fig. 3), in addition to which the results have been presented through local media (e.g. Korsten 2014) and public lectures, as well as in magazines popularising archaeology (e.g. Kriiska et al. 2014; Nordqvist et al. 2014).

In the following, the results of studies made in 2005–2014 are presented, sorted, and arranged according to the main pottery types.

2.2 Narva Ware

Currently, altogether 21 settlement sites with Narva Ware are known in the Narva–Luga area, eight of which have been discovered between 2005 and 2014 (Table 1).[2] Two Narva Ware sites have been excavated in the course of the present studies: Riigiküla VI in 2007–2008 (Fig. 4) and Izvoz 2 in 2008.

The oldest known settlements in the Narva–Luga coastal lowlands date to the Narva pe-

riod. Based on the available ^{14}C data, the area was settled (or re-settled) soon after the transgression maximum of the Litorina Sea, ca. 5200 calBC (Table 1) – as noted above, older finds have been made in soil layers buried by the transgression. The closest known pre-ceramic settlement, Narva Joaorg, is located just on the edge of the Klint (see Jaanits et al. 1982: 43–46; Kriiska 1995b). The datings obtained from the research area are among the oldest dates related to Narva Ware in the area of the Gulf of Finland and all of Estonia. However, also the youngest Narva-Ware-related dating – ca. 3800 calBC (Table 1) – derives from the Narva–Luga area. This provides grounds to suggest that the production of Narva Ware and the subsequent Comb Ware had a considerable temporal overlap in the northern part of the eastern Baltic Sea area.

The settlement during this period took place in an extensive system of lagoons surrounding the Narva–Luga Klint Bay (Gurina 1967: Fig. 97; Kriiska 1999: 174; Rosentau et al. 2013: Fig. 7). The diverse ja variable environment – apparently – provided people with ample possibilities for settlement and subsistence. Settlements seem to have been clearly shore-bound and were commonly located on lagoonal spits and islands, as well as at the mouths of rivers discharging into the lagoons – however, open seashores seem to have been avoided. The varying locations and areal extents of the sites, as well as the differences in the thickness of their cultural deposits and amount of finds, strongly indicate the presence of many types of settlements and camp sites.

Find material dating to the Narva Ware period is fairly repetitive and consists mostly of potsherds (Fig. 5). The Narva vessels are made of clays principally tempered with some organic fibrous matter, less often with crushed shell or rock debris, or with combined admixtures. Based on similarities in pottery, the Narva–Luga area can be included into a cultural area covering northern and north-eastern Estonia (Kriiska 1997: Fig. 6). However, like elsewhere in the eastern Baltic Sea region of the 6th–5th millennia calBC, the other raw materials used in the Narva–Luga micro-region do not display significant contacts with other regions (Gerasimov et al. 2010: 45). Lithic material consists almost entirely of local quartz, usually split using the bipolar knapping technique, as flint does not occur naturally in the region. Bone material is preserved only in exceptional cases, and generally only as small burned fragments.

2.3 Comb Ware

Comb Ware is known at 28 settlement sites in the Narva–Luga area – 24 of these have been found in recent studies. Between 2005 and 2014, excavations have been conducted at five Comb Ware sites: in 2006–2007 at Riigiküla II (Kriiska & Rappu 2008), in 2009 at Narva-Jõesuu I (Kriiska & Nordqvist 2010), in 2010 at Narva-Jõesuu IIa (Kriiska & Nordqvist 2012), in 2011–2014 at Narva-Jõesuu IIb (Kriiska et al. 2015a; 2015b) (Fig. 3), and in 2012 at Izvoz 3 (Fig. 6).

The radiocarbon datings obtained from Comb Ware sites fall between ca. 4100–2750 calBC (Table 1; see also Tšugai et al. 2014: Table 1). However, the oldest dating can be questioned. It derives from the Riigiküla II site, where a stoneless, partially dug-in fireplace was studied in the course of salvage excavations (Kriiska & Rappu 2008: 17). Two samples of different materials found within this fireplace were AMS dated: crust on a pottery sherd gave a median of ca. 4100 calBC (5220±50 BP; Hela-1863; $\delta^{13}C$ -28.7‰; Kriiska & Nordqvist 2012: 27), and wood charcoal from the fireplace of ca. 3650 calBC (4872±38 BP; Hela-3256; $\delta^{13}C$ -28.9‰). This implies the presence of freshwater reservoir effect in the dating of crust, although the $\delta^{13}C$ value is equally low also in the dating of wood charcoal. Finds from the fireplace included pieces of both Typical and Late Comb Ware, which indicates their contemporary or overlapping use. These pottery types have been in use simultaneously also at the Narva-Jõesuu IIa site (Kriiska & Nordqvist 2012: 24–26), where a burned animal bone from a Typical/Late Comb Ware context was dated

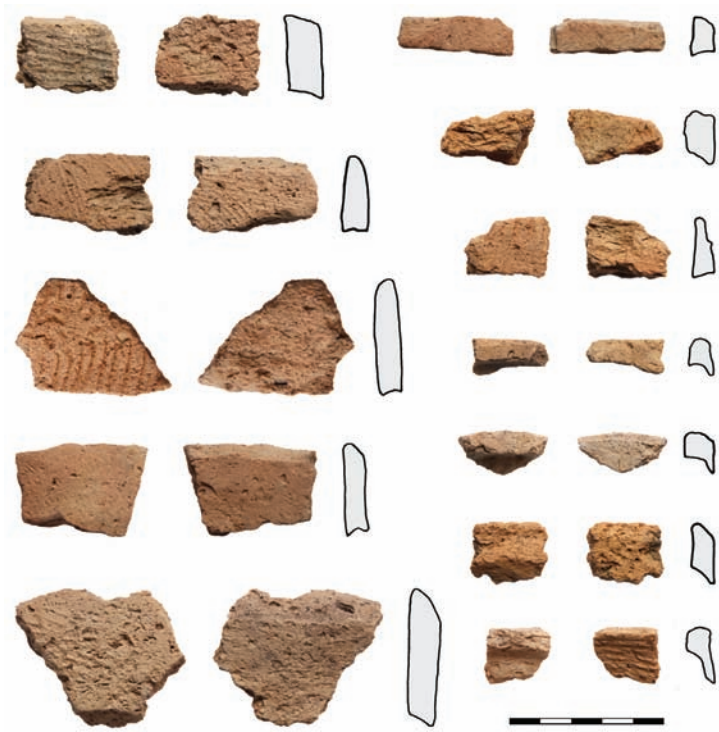


Figure 5. Fragments of Narva Ware from the Riigiküla IV site. Photos: K. Roog.

Figure 6. Trial excavations underway at the Comb Ware settlement site of Izvoz 3 in 2012. Photo: A. Kriiska.

with a median age of ca. 3300 calBC (Table 1), and at the Narva-Jõesuu I site (Kriiska & Nordqvist 2010: 20).

Palaeoenvironmental reconstructions show that Comb Ware habitation took place both on the lagoon shores and on the river banks further away from the sea (Rosentau et al. 2013: Fig. 7). Settlement was generally shore-bound and occupied the beach zone of these locations. The variation in site size, cultural deposits, and find assemblages clearly shows that in addition to probably year-round villages, many other temporary, seasonal, or special-purpose camps and locations existed in the area.

The find assemblages from Comb Ware sites are much more diverse than before. Pottery-making technology seems to have been quite standardised in the beginning, but especially in the later phases, ceramics start to exhibit varying features (Fig. 7). Also lithic materials and tool types show variation. The use of flint in knapped tool production increases significantly. This raw material was imported to the Narva–Luga region, as well as to the rest of the eastern Baltic and Finland (e.g. Kriiska 2015; Núñez & Franzén 2011), from two regions: (1) the upper reaches of the Volga River and its neighbouring area in central Russia and (2) south Lithuania and/or Belorussia. Other foreign materials were used as well, including Baltic amber (Ots 2003) and Onega metatuffite (Kriiska et al. 2013). In other words, the material culture and other cultural features evidence that by the Comb Ware period, the Narva–Luga micro-region had integrated into the reorganised, extensive social and contact networks that covered much of the eastern European forest zone (see also Nordqvist et al. 2015).

In a wider context, the material dating to the final part of the Comb Ware period, that is, to the end of the 4th and even to the turn to the 3rd millennia calBC, is highly interesting. This period of time is extremely poorly known, as only a handful of such sites have been properly studied in the eastern Baltic Sea area. In the Narva–Luga micro-region, find material and AMS datings place three sites into this time period: Narva-Jõesuu IIa, Narva-Jõesuu IIb, and Viljapea (Table 1). Despite the fact that find assemblages belonging to this phase are fairly small, they nevertheless display characteristics similar to those observed at other contemporary sites in the eastern Baltic Sea area, including the diminishing use of flint and simultaneous wide-scale utilisation of various porphyries (e.g. Edgren 1984: 40; Kriiska 2002: 38; Kriiska & Nordqvist 2012: 27–29; Mökkönen 2008: 129).

2.4 Corded Ware

Recent fieldwork has revealed altogether 19 Corded Ware settlement sites (Fig. 8) and one burial ground (Fig. 9) – a total of 25 Corded Ware sites are now known in the Narva–Luga micro-region. Between 2005 and 2014, several of the newly-found sites have also been investigated through excavations: the Riigiküla XIV site was studied in 2005–2006 (Kriiska & Nordqvist 2007), Narva-Jõesuu I in 2009 (Kriiska & Nordqvist 2010), Narva–Jõesuu IIa in 2010 (Kriiska & Nordqvist 2012), and the Narva Jõesuu IIb settlement and burial site in 2011–2014 (Kriiska et al. 2015a; 2015b) (Figs. 2 & 3, 8 & 9).

The ^{14}C dates obtained from Corded Ware finds and contexts delimit a period of ca. 2800–2000 calBC (Table 1). This suggests a very long duration for this cultural phase, as well as an exceptionally late survival of Corded Ware in the Narva–Luga area (in many areas the end of Corded Ware is commonly placed in ca. 2400/2300 calBC; e.g. Larsson 2009: 17; Włodarczak 2009: 738).

By the time Corded Ware started to be manufactured, the natural conditions had significantly changed from the preceding ones: the lagoons had become completely isolated from the sea and were in many cases already overgrown. Thus, by the early 3rd millennium calBC, the landscape of the area was probably quite reminiscent of the present, comprising sandy ridges alternating with rivers, small lakes, ponds, and bogs (Rosentau et al. 2013: Fig. 7). Also the settlement pattern of

Figure 7. Selection of Comb Ware from the Riigiküla II site. Photos: K. Roog.

the Corded Ware people deviates from that of the earlier times. Instead of being located by larger waterbodies, sites are now situated by more restricted waters – or by no waters at all. Most sites are placed on the banks of rivers or smaller streams, or, alternatively, near small ponds (Fig. 8), but there are also some sites which are situated inland, away from any ancient or present-day waterbodies. No sites are known from the seashore of that period.

Corded Ware sites in the Narva–Luga area are very variable in terms of their dimensions, finds and other properties. Even if most of the sites seem to be small and poor in finds – which seems to be the norm in the neighbouring areas too (see Kriiska 2000; Nordqvist & Häkälä 2014) – also sites with thick cultural layers and areas of more than half a hectare have been encountered. The smaller sites indicate that the settlement system was based on single households. The existence of larger sites does not necessarily contradict this interpretation, as they may have been formed as a result of long-term relocating or recurrent settlement in the same places (Kriiska et al. 2015a). Nevertheless, more datings and analyses are needed to confirm these hypotheses.

Large sites, as well as the long duration and the late survival of the cultural phase, make the Narva–Luga area a bit unusual in terms of Corded Ware. Further, many settlements seem to be fairly 'clean', that is, devoid of material from other periods and cultural phases, which is quite uncommon elsewhere. Also the structures revealed in the recent excavations are quite unique, including the first semi-

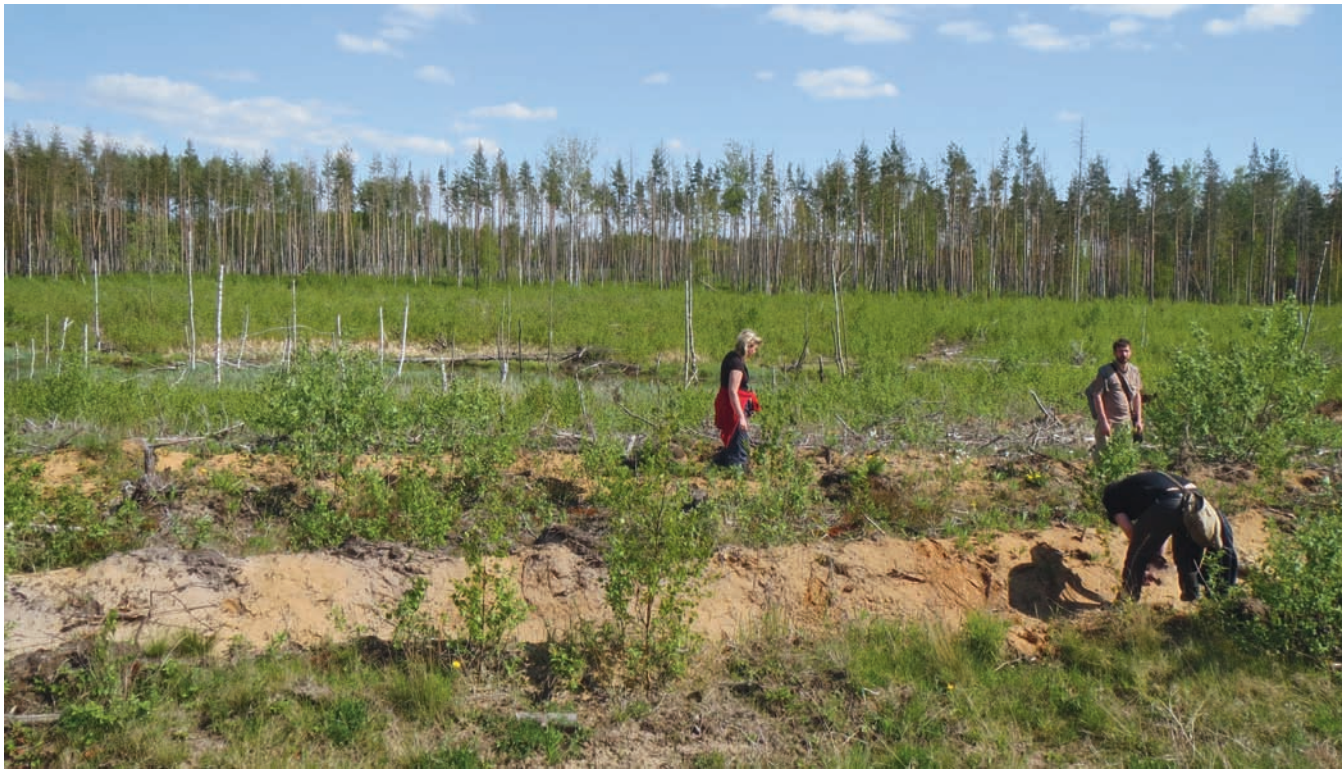


Figure 8. The discovery of the Corded Ware site Rosson 9, situated next to a small pond, in 2012. Photo: A. Kriiska.

subterranean, log-based Corded Ware houses in the northern Baltic Sea area, as well as the first Corded Ware burials excavated in Estonia since the 1940s (see Kriiska et al. 2015a; 2015b) (Fig. 9).

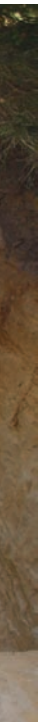
The composition of find material from the settlement sites is relatively uniform. The assemblages consist mostly of pottery fragments (Fig. 10), although in some cases quartz and flint flakes and artefacts, as well as a few whetstones, have been recovered. Also some burned bone fragments are present. Similarities in pottery connect the Narva–Luga region with a wider cultural area in northern Latvia, Estonia, southern Finland, and the Karelian Isthmus (Russia), but also with areas further east, in central Russia. Flint material, found in clear Corded Ware contexts, most likely derives from southern Lithuania or Belorussia, thus indicating contacts with people living in the more southern regions as well.

3 Concluding remarks

The Narva–Luga micro-region, situated on the border of Estonia and Russia, is a central area for the research of prehistoric habitation in the eastern Baltic Sea area, although the material gathered there also provides insight into the study of past human activities in all of eastern and northern Europe. During the international and interdisciplinary research conducted in the Narva–Luga area in 2005–2014, altogether 42 new archaeological sites were discovered, and many of these sites were also excavated. The interdisciplinary approach and the use of modern methodology have facilitated the creation of reliable palaeogeographical reconstructions and a more detailed view on the Stone Age and Early Bronze Age settlement and land use. Abundant find material provides us with further information about the living conditions, settlement and housing, material culture, technology, spiritual

Figure 9. Recently excavated Corded Ware structures – a partially revealed semi-subterranean log-based house (left) and a double burial (right) – at the Narva-Jõesuu IIb site. Photos: K. Nordqvist.

Figure 10. Corded Ware pottery sherds found at settlement sites in the Narva–Luga area: 1 – Rosson 8; 2 – Rosson 7; 3–6 – Narva-Jõesuu IIb. Photos: A. Kriiska.



culture, and contacts of the prehistoric inhabitants of this region. Thanks to the increasing amount of ^{14}C dates, the chronological resolution of the developments has also become more fine-grained.

The sites discovered over the last 10 years represent all three early pottery types characteristic of the eastern Baltic Sea area: Narva Ware, Comb Ware, and Corded Ware. During the Narva and Comb Ware periods, the Narva–Luga micro-region was occupied by a vast lagoonal system, which provided good settings for human habitation. Settlements were placed on lagoonal spits and islands and at river mouths, they were located on the immediate shore or the beach zone, and they followed the retreating shoreline through time. By the Corded Ware period, the elevation of the sea had lowered further, and the lagoons were practically overgrown – the landscape resembled that of today. Habitation was now located on river banks and near small waterbodies (ponds), but also totally inland locations appear – closeness to the shore seems to have lost its importance, at least partially.

The studies conducted in the Narva–Luga area thus far have built a sturdy basis of multidisciplinary data for the use of future research. The existing materials already provide a good basis for the study of the chronology and temporal overlap of different pottery types, for example. Also the poorly-known late-4th-millennium-calBC assemblages and sites could be a theme for upcoming studies. A well-established block of research, which will definitely move on in the future, is the study of Corded Ware: the abundant array of relatively undisturbed sites provides excellent conditions for the continuation of this work.

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References

Published sources and literature

Bronk Ramsey, C. 2009. Bayesian Analysis of Radiocarbon Dates. *Radiocarbon* 51 (1): 337–360.

Edgren, T. 1984. Kivikausi. In Y. Blomstedt (ed.) *Suomen historia* 1: 9–112. Espoo: Weilin+Göös.

Efendiyev 1983 = Эфендиев, Э. Ф. 1983. Раскопки в западном Принаровье. *Археологические открытия 1981 года*: 396.

Gerasimov et al. 2010 = Герасимов, Д. В., Крийска, А. & Лисицын, С. Н. 2010. Освоение побережья Финского залива Балтийского моря в каменном веке / Colonization of the Gulf of Finland (the Baltic Sea) Coastal Zone in the Stone Age. In А. В. Голавнев (ed.) *III Северный археологический конгресс*: *Доклады*: 28−53. Екатеринбург & Ханты-Мансийск: ИздатНаукаСервис.

Gerasimov et al. 2012 = Герасимов, Д. В., Крийска, А. & Лисицын, С. Н. 2012. Памятники каменного века юго-восточного побережья Финского залива: Хронология и геоморфология. *Краткие сообщен-*

ия Института археологии РАН 227: 241–247.

Gerasimov et al. 2013 = Герасимов, Д. В., Крийска, А. & Холкина, М. А. 2013. Археологические исследования 2012 г. на Кудрукюльской палеокосе в нарвско–лужском междуречье. *Научные исследования и музейные проекты МАЭ РАН в 2012 г.*: *Радловский сборник*: 21–27.

Gurina 1961 = Гурина, Н. Н. 1961. *Древняя история Северо-Запада Европейской части СССР.* Материалы и исследования по археологии СССР 87.

Gurina 1967 = Гурина, Н. Н. 1967. *Из истории древних племен западных областей СССР (по материалам Нарвской экспедиции).* Материалы и исследования по археологии СССР 144.

Gusentsova & Sorokin 2012 = Гусенцова, Т. М. & Сорокин, П. Е. 2012. Первый памятник эпох неолита и раннего металла (Охта I) в Санкт-Петербурге. In С. А. Васильев & В. Я. Шумкин (eds.) *Мезолит и неолит Восточной Европы*: *Хронология и культурное взаимодействие*: 182–199. Санкт-Петербург: ИИМК & МАЭ РАН.

Indreko, R. 1932. Kiviaja võrgujäänuste leid Narvas. *Eesti Rahva Muuseumi Aastaraamat* VII: 48–67.

Indreko, R. 1948. Bemerkungen über die wichtigsten steinzeitlichen Funde in Estland in den Jahren 1937–1943. *Antikvariska Studier* III: 291–315. Kungliga Vitterhets Historie och Antikvitets Akademiens Handlingar 65.

Jaanits, L. 1955. Neoliitilised asulad Eesti NSV territooriumil. In H. Moora & L. Jaanits (eds.) *Muistsed asulad ja linnused*: 176–201. Tallinn: Eesti Riiklik Kirjastus.

Jaanits, L. 1965. Über die Ergebnisse der Steinzeitforschung in Sowjetestland. *Finskt Museum* 72 (1965): 5–46.

Jaanits, L. 1968. Die frühneolithische Kultur in Estland. In P. Ravila (ed.) *Congressus secundus internationalis Fenno-Ugristarum, Pars* II: 12–25. Helsinki: Societas Fenno-Ugrica.

Jaanits, L., Laul, S., Lõugas, V. & Tõnisson, E. 1982. *Eesti esiajalugu*. Tallinn: Eesti raamat.

Kadakas, U., Vedru, G., Lõugas, L., Hiie, S., Kihnщ, K., Kadakas, V., Püüa, G. & Toos, G. 2010. Rescue Excavations of the Neolithic Settlement Site in Vabaduse Square, Tallinn. *Archaeological Fieldwork in Estonia* 2009: 27–46.

Korsten, T. 2014. Narva-Jõesuus leiti Eesti vanim ristpalkmaja / В Нарва-Йыэсуу обнаружили древнейший в Эстонии сруб. *Põhjarannik / Северное побережье* 14 August 2014: 6–7.

Kriiska, A. 1995a. New Neolithic Settlements in Riigiküla. *Eesti Teaduste Akadeemia Toimetised, Humanitaar- ja sotsiaalteadused* 44 (4): 448–454.

Kriiska, A. 1995b. Narva jõe alamjooksu ala neoliitiline keraamika. In V. Lang (ed.) *Eesti arheoloogia historiograafilisi, teoreetilisi ja kultuuriajaloolisi aspekte*: 54–115. Muinasaja teadus 3.

Kriiska, A. 1996a. Stone Age Settlements in the Lower Reaches of the Narva River, North-Eastern Estonia. In T. Hackens, S. Hicks, V. Lang, U. Miller & L. Saarse (eds.) *Coastal Estonia*: *Recent Advances in Environmental and Cultural History*: 359–369. PACT 51.

Kriiska, A. 1996b. Archaeological Excavations on the Neolithic Site of Riigiküla IV. *Eesti Teaduste Akadeemia Toimetised, Humanitaar- ja sotsiaalteadused* 45 (4): 410–419.

Kriiska, A. 1997. Kroodi ja Vihasoo III asula Eesti varaneoliitiliste kultuurirühmade kontekstis. *Estonian Journal of Archaeology* 1: 7−25.

Kriiska, A. 1999. Formation and Development of the Stone Age Settlement at Riigiküla, Northeastern Estonia. In U. Miller, T. Hackens, V. Lang, A. Raukas & S. Hicks (eds.) *Environmental and Cultural History of the Eastern Baltic Region*: 173–183. PACT 57.

Kriiska, A. 2000. Corded Ware Culture Sites in North-Eastern Estonia. In V. Lang & A. Kriiska (eds.) *De temporibus antiquissimis ad honorem Lembit Jaanits*: 59–79. Muinasaja teadus 8.

Kriiska, A. 2002. Lääne-Eesti saarte asustamine ja püsielanikkonna kujunemine. In V. Lang (ed.) *Keskusest ääremaaks*: *Viljelusmajandusliku asustuse kujunemine ja areng Vihasoo-Palmse piirkonnas Virumaal*: 29–60. Muinasaja teadus 7.

Kriiska, A. 2015. Foreign Materials and Artefacts in the 4th and 3rd Millennia BCE Estonian Comb Ware Complex. In P. Espak, M. Läänemets & V. Sazonov (eds.) *When Gods Spoke*: *Researches and Reflections on Religious Phenomena and Artefacts*: *Studia in honorem Tarmo Kulmar*: 107−124. Studia Orientalia Tartuensia, Series Nova VI.

Kriiska & Gerasimov 2014 = Крийска, А. & Герасимов, Д. В. 2014. Период позднего мезолита в восточной части Балтийского моря: Формирование берегового расселения от Рижского до Выборгского. In В. Н. Карманов (ed.) *От Балтики до Урала*: *Изыскания по археологии каменного века*: 5–36. Сыктывкар: ИЯЛИ Коми НЦ УрО РАН.

Kriiska, A. & Lõugas, L. 2009. Stone Age Settlement Sites on an Environmentally Sensitive Coastal Area along the Lower Reaches of the River Pärnu (South-Western Estonia), as Indicators of Changing Settlement Patterns, Technologies and Economies. In S. McCartan, R. Schulting, G. Warren & P. Woodman, P. (eds.) *Mesolithic Horizons*: 167–175. Oxford: Oxbow Books

Kriiska, A. & Nordqvist, K. 2007. Archaeological Fieldwork at Stone Age Settlement Sites in Riigiküla, North-Eastern Estonia. *Archaeological Fieldwork in Estonia* 2006: 31–44.

Kriiska, A. & Nordqvist, K. 2010. Results of Archaeological Fieldwork in Narva-Jõesuu in 2009. In A. Kriiska & M. Ivaske (eds.) *Minevikupärand tänases päevas*: *Uurimusi Narva piirkonna ajaloost*: 12–30. Narva Muuseumi toimetised 10.

Kriiska, A. & Nordqvist, K. 2012. Arheoloogilised väljakaevamised Narva-Jõesuu IIa neoliitilisel asulakohal 2010. aastal. In A. Kriiska & M. Ivaske (eds.) *Märgilised mälestised*: *Uurimusi Narva piirkonna ajaloost*: 15–37. Narva Muuseumi toimetised 12.

Kriiska et al. 2015a = Крийска, А., Нордквист, К., Герасимов, Д. В. & Санделл, С. 2015. Новые исследования памятников со шнуровой керамикой в Нарвско–Лужском междуречье, в пограничье России и Эстонии. *Тверской археологический сборник, Вып.* 10: 39–48.

Kriiska, A., Nordqvist, K., Gerasimov, D. V. & Sandell, S. 2015b. Preliminary Results of the Research at Corded Ware Sites in the Narva–Luga Interfluve, Estonian–Russian Border Area in 2008–2014. *Archaeological Fieldwork in Estonia* 2014: 39–50.

Kriiska, A., Nordqvist, K., Varul, L. & Sandell, S. 2014. Narva-Jõesuu (IIb) asula- ja matmispaik – nöörkeraamika ajastu pärl. *Tutulus* 2014: 24–25.

Kriiska, A. & Rappu, M. 2008. Riigiküla II asulakoha 2006.–2007. aasta arheoloogiliste päästekaevamiste tulemused. In A. Kriiska (ed.) *Maal, linnas ja linnuses*: *Uurimusi Narva piirkonna ajaloost*: 8–45. Narva Muuseumi toimetised 8.

Kriiska, A., Rappu, M., Tasuja, K., Plado, J. & Šafranovski, J. 2009. Archaeological Research in Jägala. *Archaeological Fieldwork in Estonia* 2008: 36–52.

Kriiska, A., Tarasov, A. & Kirs, J. 2013. Wood-chopping

tools of the Russian-Karelian Type from Estonia. In K. Johanson & M. Tõrv (eds.) *Man, His Time, Artefacts, and Places*: *Collection of Articles Dedicated to Richard Indreko*: 317–345. Muinasaja teadus 19.

Kulkova, M. A., Gusentsova, T. M., Sapelko, T. V., Nesterov, E. M., Sorokin, P. E., Ludikova, A. V., Ryabchuk, D. V. & Markova, M. A. 2014. Geoarchaeological Investigations on the Development of the Neva River Delta (Gulf of Finland) during the Holocene. *Journal of Marine Systems* 129: 19–34.

Larsson, Å. 2009. *Breaking and Making Bodies and Pots*: *Material and Ritual Practices in Sweden in the Third Millennium BC*. Aun 40.

Mökkönen, T. 2008. A Review of Neolithic Multi-Room Housepits as Seen from the Meskäärtty Site in Virolahti Parish, Extreme South-Eastern Finland. *Estonian Journal of Archaeology* 12 (2): 114–151.

Moora, H. 1957. Eine steinzeitliche Schlangenfigur aus der Gegend von Narva. In C. F. Meinander (ed.) *Studia Neolithica in honorem Aarne Äyräpää*: 225–232. Suomen Muinaismuistoyhdistyksen Aikakauskirja 58.

Nordqvist, K. & Häkälä, P. 2014. Distribution of Corded Ware in the Area North of Gulf of Finland: An Update. *Estonian Journal of Archaeology* 18 (1): 3–29.

Nordqvist, K., Kriiska, A. & Sandell, S. 2014. Nuorakeraaminen hauta ja muuta mukavaa: Tutkimuksia Narva-Jõesuun kivikautisilla asuinpaikoilla. *Hiisi* 1/2014: 20–25.

Нордквист, К., Крийска, А. & Герасимов, Д. В. 2015. Социальная реорганизация населения каменного века в восточной части Балтийского моря в 4 тыс. до н.э.: Структура расселения, стратегия жизнеобеспечения и система коммуникаций / Reorganisation of the Stone Age Societies in the Eastern Part of the Baltic Sea in the 4th Millennium BC: Settlement Structures, Subsistence Strategy and Communication Networks. In Н.И. Чаиркина (ed.) *IV Северный археологический конгресс*: *Доклады*: 132–152. Ханты-Мансийск & Екатеринбург: Правительство ХМАО – Югры, ИИА УрО РАН, УрФУ, ИАЭТ СО РАН, ИА РАН.

Núñez, M. & Franzén, P. 2011. Implications of Baltic Amber Finds in Northern Finland 4000–2000 BC. *Archaeologia Lituana 12*: 10–24.

Ots, M. 2003. Stone Age Amber Finds in Estonia. In C. W. Beck, I. B. Loze & J. M. Todd (eds.) *Amber in Archaeology*: *Proceedings of the Fourth International Conference on Amber in Archaeology, Talsi 2001*: 96–107. Riga: Institute of the History of Latvia Publishers.

Petrenko & Efendiyev 1985 = Петренко, В. П. & Эфендиев, Э. Ф. 1985. Работы на территории Эстонии и Ленинградской области. *Археологические открытия 1983 года*: 453.

Reimer, P. J., Bard, E., Bayliss, A., Beck, J. W., Blackwell, P. G., Bronk Ramsey, C., Grootes, P. M., Guilderson, T. P., Haflidason, H., Hajdas, I., Hatté, C., Heaton, T. J., Hoffmann, D. L., Hogg, A. G., Hughen, K. A., Kaiser, K. F., Kromer, B., Manning, S. W., Niu, M., Reimer, R. W., Richards, D. A., Scott, E. M., Southon, J. R., Staff, R. A., Turney, C. S. M. & van der Plicht, J. 2013. IntCal13 and Marine13 Radiocarbon Age Calibration Curves 0–50,000 Years cal BP. *Radiocarbon* 55 (4): 1869–1887.

Rosentau, A., Veski, S., Kriiska, A., Aunap, R., Vassiljev, J., Saarse, L., Hang, T., Heinsalu, A. & Oja, T. 2009. Water-Level Changes and Palaeogeography of the Baltic Sea and Displacement of Stone Age Human Occupations in Pärnu Area, Southwest Estonia. In *BSSC 2009 Abstract Book*: *7th Baltic Sea Science Congress*: *August 17–21, 2009 Tallinn*: 195. Tallinn: Tallinn University of Technology & Tartu University.

Rosentau, A., Muru, M., Kriiska, A., Subetto, D., Vassiljev, J., Hang, T., Gerasimov, D., Nordqvist, K., Ludikova, A., Lõugas, L., Raig, H., Kihno, K., Aunap, R. & Letyka, N. 2013. Stone Age Settlement and Holocene Shore Displacement in the Narva–Luga Klint Bay Area, Eastern Gulf of Finland. *Boreas* 42 (4): 912–931.

Tšugai, A., Plado, J., Jõeleht, A., Kriiska, A., Mustasaar, M., Raig, H., Risberg, J. & Rosentau, A. 2014. Ground-Penetrating Radar and Geological Study of the Kudruküla Stone Age Archaeological Site, Northeast Estonia. *Archaeological Prospection* 21 (3): 225–234.

Włodarczak, P. 2009. Radiocarbon and Dendrochronological Dates of the Corded Ware Culture. *Radiocarbon* 51 (2): 737–749.

Notes

1 This paper generally follows the Russian periodisation, in which Corded Ware is included into the Bronze Age – in Estonian periodisation this cultural phase is still counted within the Neolithic. All dates are calibrated by OxCal v4.2 (Bronk Ramsey 2009); r5; IntCal13 atmospheric curve (Reimer et al. 2013).

2 Narva Ware has been named after and defined according to the finds made in the Narva area in the 1950s (see Gurina 1967; Jaanits 1968; Kriiska 1995b).

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