

## Rupunkangas 4: A charcoal production pit from the Late Iron Age and early historical period on the Karelian Isthmus

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### Abstract

In 2004–2005, the Kaukola-Räisälä -project of the University of Helsinki studied a group of Stone Age settlement sites on a former island of Ancient Lake Ladoga. At the settlement site Rupunkangas 4 (Ru. Protochnoe 3) in the former municipality of Kaukola (today Sevast'yanovo), a pit feature that was preliminarily identified as a cooking pit was excavated. The investigations revealed that this object was a simple charcoal production pit; In addition, a quarter of another possible charcoal pit was excavated. Based on radiocarbon dating, these features date between 1200 and 1650 calAD. This article presents the results of the excavations and briefly discusses the simple charcoal pits, their dating, properties and context of use.

Keywords: charcoal production pits, Middle Ages, Karelian Isthmus, Russia, Finland.

### 22.1 Introduction

Charcoal and charcoal production are a vital and laborious part of the pre-modern iron production process. Even if iron furnaces are known already since the 1st millennium calBC (Kosmenko & Manjuhin 1999; Lavento 2013; Peets 2003), the low-level domestic production of charcoal before the founding of the ironworks from the 16th century onwards is little known. Most of the sparse archaeological research into charcoal production in Finland, as well as north-west Russia, has focused on the younger and larger relict charcoal hearths (Fi. hiilimiilu, Sw. kolmila, Ru. uglezhognaya kucha): before the use of hard coal became common in the 19th century, charcoal production was an important secondary source of income for many rural residents in our area of interest (see Kangaskesti 2021: 141; Sobolev & Shmelev 2017: 64).

The various types of relict charcoal hearths with ring walls, ditches and mounds are relatively easy to recognise during fieldwork, and nowadays increasingly from high-resolution LiDAR-data (Hirsch et al. 2020; Ikäheimo 2021). Instead, the traces left by simple charcoal production are often more difficult to capture and interpret. They are rarely more than a shallow pit or depression on the ground



Figure 22.1. The Rupunkangas 4 site is located on a flat pine barren area on the eastern Karelian Isthmus (Russian Federation). The charcoal pit discussed in this article was excavated in July 2005. Photo T. Mökkönen.

(hence the name used here: *charcoal production pit* or *charcoal pit*; with *relict charcoal hearths* we mean larger structures with a clear pit and observable embankments, see Kangaskesti 2021), and their original function and properties usually cannot be determined without additional research. Consequently, charcoal pits are easy to mix with other human-made pit features such as tar burning pits, cooking pits and hunting pits. The case study presented in this article is an example of this: an object that was classified as a cooking pit in a survey turned out to be a charcoal pit during the excavations.

## 22.2 The charcoal production pit of Rupunkangas 4

The Rupunkangas 4 (Ru. Protochnoe 3) site is located in the former municipality of Kaukola (today Sevast'yanovo, the Russian Federation) (Fig. 22.1). It was found in 2004 during a Finnish-Russian research project that focused on the Stone Age and Early Metal Period in the River Vuoksi valley on the Karelian Isthmus. The project was led by Professor Mika Lavento and was funded by the University of Helsinki (in collaboration with the Institute for the History of Material Culture and the Kunstkamera museum, the Russian Academy of Sciences; see Lavento et al. 2006). During the fieldwork, a large elongated depression and four modest but clear pit features were recorded at this Stone Age settlement site. The site is located on a former island of Ancient Lake Ladoga, in a place that was very suitable for seal hunting at that time (see Mökkönen et al. 2007). This fact, in addition to the observations made from soil cores during the survey, led to the interpretation that the pit features are the remains of cooking pits used to extract seal train oil.

In 2005 one of the pit features (no. I) was excavated (see Gerasimov 2006; Mökkönen 2005). On the surface it was a roundish pit with a diameter of less than 2 m and a depth of ca. 20 cm and was surrounded by very vague and low banks. After starting the work, it quickly became clear that this structure, dug into the stony moraine, was not a cooking pit. The stone packing characteristic of cooking pits was completely absent, and instead the bowl-shaped pit was filled with dark grey sand,





Figure 22.2. Charcoal pit during excavations. The western part is dug halfway to the bottom and is clearly visible as dark grey charcoal-rich soil against the clean bottom sand. The partially investigated pit feature is located in the corner of the excavation area in front of the trowel and is faintly visible as an area of reddish burned sand mixed with charcoal. Photo T. Mökkönen.

rich in charcoal pieces and particles (Figs. 22.2 and 22.3). The dark grey filling turned almost black towards the end. The relatively flat pit with a round bottom had no internal structures (e.g. ventilation channels, outlet pipe or a central container for collecting tar), but a horizontal piece of charred wood, about 40 cm long, was discovered near the bottom. The excavations showed that the pit was round in shape, approximately 160 cm in diameter and about 50 cm deep (measured from the top of the mineral soil). Some knapped lithic artefacts (quartz and rock crystal) originating from the Stone Age cultural layer in the area were found mainly around the pit, but partially also in its mixed fill.

In addition, a second small pit feature was discovered in the corner of the excavation area. Assuming that this structure also has a round bottom, a quarter of its volume was exposed and excavated. The second pit was not visible on the ground surface, but it was similarly filled with grey charcoal-mixed sand. In contrast to the fully excavated feature, the contact of the fill and the clean undersoil was partially burned bright red. Supposedly, this second structure is also a charcoal pit of roughly similar dimensions; its excavated part was dug to a depth of 50 cm from the ground surface.

No artefacts that could date the pits were found during the excavations. A radiocarbon date obtained from a sample taken from the charred piece of wood at the bottom of the fully excavated feature dated the pit to 1450–1635 calAD (Hela-1181, 370±40 BP), it is, to the late medieval and the early modern period<sup>1</sup>. A wood charcoal sample from the partially excavated pit gave an even older

<sup>1</sup> The dates are calibrated with OxCal 4.4.2 (Bronk Ramsey 2009) using IntCal20 (Reimer et al. 2020) and given with a 95.4% probability. Both dates are published here for the first time.

age and placed the feature at the turn of the Late Iron Age and the Middle Ages, 1220–1380 calAD (Hela-1191, 745±40 BP).

In other words, an object that outwardly resembled a cooking pit turned out to be a much younger than the Stone Age settlement in which it is situated. The excavations also revealed another pit feature that was not recorded at all above ground. Because of the shape, dimensions, and charcoal-rich filling, as well as the lack of any structural features normally connected with tar burning pits, these two pits can be classified as simple charcoal production pits.<sup>2</sup>

## 22.3 Simple charcoal pits in a wider context

The size and type of the Rupunkangas feature connects it to the simple charcoal production tradition known practically all over the world. In central Europe, such basic and small charcoal pits were used from the Roman times to the (pre-)modern era (Hirsch et al. 2020: 975–976). In southern Scandinavia, simple charcoal pits often date from the Late Iron Age to the Middle Ages (Loftsgarden 2015: 147, 150–151; Tveiten 2015: 332). Similar pits correspond to the charcoal pits used for household and low-level production in Finland during the historical period (Kangaskesti 2021: 149). Corresponding features are also considered to represent the earliest phase of charcoal production in north-west Russia, but remain in use locally until the 19th and even the early 20th centuries (Sobolev & Shmelev 2017: 64; Zhu'lnikov 2019: 23).

The simple charcoal pits are a monument type that is difficult to define. They are usually small, only a few metres in diameter and less than a metre deep, but their properties vary with time and area: the shape range from round to rectangular, and the banks can be vague or indistinct. Differentiating between simple charcoal and tar burning pits is also difficult, as the medieval iron production site Jyväskylä Kirri 2 in central Finland shows (Luoto 2019; Tiainen 2019; see also Mikkola 2015). Here, large relict charcoal hearths with clear embankments (radiocarbon dated between the 11th and the 16th centuries calAD) were studied, but a smaller pit (dating 1220–1284 calAD) was interpreted as a tar burning pit – or a charcoal pit (Tiainen 2019).<sup>3</sup> However, given its simple structure and location just 30 m from a medieval iron furnace, an interpretation as a charcoal burning pit is more likely (for

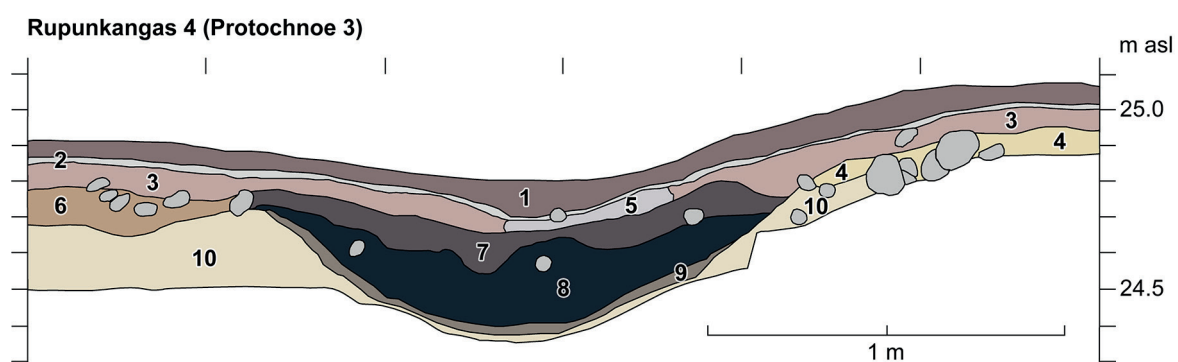


Figure 22.3. Cross-section of the charcoal pit at Rupunkangas 4. 1 – turf; 2 – grey sand (eluvial layer); 3 – brown sand (illuviated layer); 4 – light brown sand (clean); 5 – white-grey sand; 6 – yellowish brown sand (weak cultural layer); 7 – dark grey sand with soot and charcoal (upper part of the fill); 8 – black sand with a lot of soot and charcoal (lower part of the fill); 9 – yellow sand with charcoal spots bleached from above; 10 – yellow sand (clean). Drawing K. Nordqvist.

<sup>2</sup> Tar burning pits or kilns also vary in shape and size, but should always contain a gutter or pipe for draining the liquid tar, and/or a central container to collect the tar (Hennius 2018; Turpeinen 2010). In addition, lumps of tar and also a distinctive odour in the soil may be encountered.

<sup>3</sup> Based on the documentation in the report of the Kirri 2 site (Tiainen 2019), the possible tar collecting pit interpreted at the bottom of the smaller feature is not clear and overlaps with the test pit dug by the excavators prior to the large-scale investigations.



a similar discussion of a pit feature investigated near Voknavolok in northern Karelia, see Shakhnovich 2014; Sobolev & Shmelev 2017: 65).

In Finland, research into the Late Iron Age and early medieval iron production, including the production of its main fuel, has been very sporadic (Edgren 2008: 476). Only a handful of relict charcoal hearths and charcoal pits have been excavated. In recent years, rescue archaeology and survey projects with an increasing emphasis on the recording of also (pre-)modern objects of industrial archaeology, as well as the introduction of LiDAR-based analyses have begun to change this situation. Still, the attention is often on the younger and more massive monuments (i.e. relict charcoal hearths). Similarly, in north-west Russia, rescue archaeology projects have increased the amount of recorded objects, but so far, the focus of excavation has been on the larger mounds and simple charcoal pits remain a small minority (Mikhaylova et al. 2018; Sobolev & Shmelev 2017; Suvorov 2008; Zhul'nikov 2016).

Many of the charcoal production structures excavated on the Karelian Isthmus are also bigger relict charcoal hearths related to large-scale production, such as those near the ironworks and arsenal of Sestroretsk or the city of Vyborg, and relatively young, the 18th–20th centuries (Mikhaylova et al. 2018: 33–35; Sobolev & Shmelev 2017: 65; Zhul'nikov 2019: 23). The closest similar features associated with low-level local production like the Rupunkangas 4 are the charcoal pits investigated about 15 km to the north-west of it in Hiitola Veijalanjärvi and ca. 50 km to the north in Ihala. The former pits are dated to the 15th–20th centuries (Zhul'nikov 2016: 5), while the latter were radiocarbon dated to the 13th and 19th–20th centuries (Tarasov, pers.comm.). The Rupunkangas 4 features belong to the earlier end of this spectrum.

During the Crusade Period and the early Middle Ages (the first four to five centuries of the 2nd millennium calAD), the so-called Karelian Culture flourished on the Karelian Isthmus (Laakso 2016). Characteristic for it are inhumation cemeteries, which reflect both long-distance contacts and a distinctive local style that is materialised particularly in bronze and iron artefacts and jewellery (Uino 1997: 353–394). The Kaukola region is situated at the centre of this cultural area – the nearest iconic cemeteries are located only 3–4 km to the north-west of Rupunkangas (Uino 1997: 231–234). The area was also near the emerging regional centre Käkisalmi (Priozersk) and was the borderland of the expansive western Swedish and eastern Novgorod (later Moscow) empires. The recurrent use of the Rupunkangas 4 charcoal production site shows the need for charcoal over the course of these centuries: the local metal processing and other activities constantly required fuel.

## 22.4 Afterword

Simple charcoal pits are a monument type that, like many other (pre-)modern (rural) antiquities related to production and industrial livelihoods, has largely escaped the attention of archaeologists (Immonen et al. 2018: 24). Recently, the introduction of high-resolution LiDAR has revolutionised the recognition of pit-like monuments such as relict charcoal hearths, tar burning pits, hunting pits and cooking pits (Hirsch et al. 2020; Ikäheimo 2021). Through automated feature detection, thousands and thousands of new sites and features are being recorded, making these monuments by far the most numerous antiquities in our forests. In addition to opening up venues for completely new inquiries to the past ways of living this also poses new challenges for culture resource management and forces us to rethink the meaning and status of these monuments.

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