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Research on the Mesolithic of North Karelia in 2003–2017

Implications for the early postglacial archaeology of Northern Europe

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Abstract

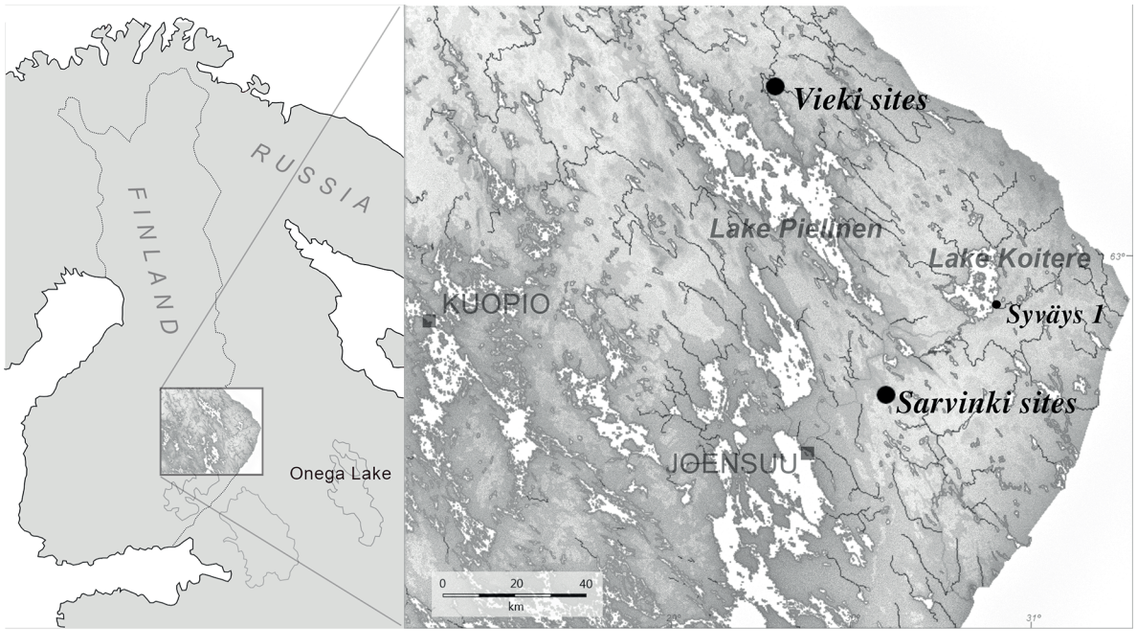
In this paper we describe the results of small-scale archaeological fieldwork projects carried out in North Karelia, Finland, in 2003–2014, which ended up having a far greater research impact than anyone could have anticipated. The projects yielded a multitude of new and relevant information, especially on the Early Mesolithic, including the earliest radiocarbon dates for human occupation in Eastern Fennoscandia. Results of this research have been published in a variety of venues. We use this opportunity to present the first summary of these results and to emphasize that even with discontinuous short-term funding it is possible to carry out ambitious and influential research. Over the years, Karelia has been one of the main focus areas of Mika Lavento's research. We want to honour Mika's 60th birthday by providing an overview of the results of our studies conducted in the northern parts of this large geographical and administrative area.

Keywords: Mesolithic, Eastern Fennoscandia, lithics, radiocarbon dates, Karelia, pioneer colonization.

6.1 Introduction

6.1.1 Why North Karelia?

The basis for the work in North Karelia (Fig. 6.1) discussed here was laid in two earlier projects. The first Stone Age settlement sites by the former Lake Sarvinki, drained in the 18th century, were discovered during an archaeological survey in 2003, organized by the Museum of North Karelia. From the beginning it was obvious that one particular artefact, a flint scraper on a blade from the site Jokivarsi 1, was unique among the finds. It could be typologically dated to the Early Mesolithic (Manninen & Hertell 2011). At the time, such blade artefacts were known from only a few locations in Finland and Northwest Russia, dating back to the very beginning of the postglacial pioneer colonization. Soon



Site	lab code	C14 age BP	13C	calBP (68,3%)	median	material	catalogue nr.
Jokivarsi 1	Hela-2947	9560±60	-27,60	**11080-10750**	**10920**	birch bark tar	KM 38981:2
Jokivarsi 1	Ua-41027	9507±85	-27,30	**11070-10600**	**10830**	burnt bone (mammal)	KM 38400:7
Jokivarsi 1	Hela-2946	9489±59	-28,80	**11070-10590**	**10760**	burnt bone (elk)	KM 38981:4
Jokivarsi 1	Hela-2945	9408±59	-28,10	**10720-10520**	**10640**	burnt bone (elk)	KM 38981:3
Kaiskunsärkkä 1	Ua-41028	8055±64	-29,00	**9090-8770**	**8920**	burnt bone (fish)	KM 38401:4
Rahakangas 1	Hela-2721	9533±56	-27,30	**11070-10710**	**10870**	burnt bone (elk)	KM 38399:1459
Rahakangas 1	Hela-2380	9461±61	-28,30	**11000-10580**	**10710**	burnt bone (elk)	KM 37962:503
Rahakangas 1	Hela-882	9405±80	-28,10	**10740-10510**	**10640**	burnt bone (elk)	KM 34163:2
Rahakangas 1	Hela-2720	8038±47	-27,30	**9020-8770**	**8900**	burnt bone (beaver)	KM 38399:879
Rahakangas 1	Hela-2379	7726±58	-27,00	**8550-8420**	**8500**	charcoal (red-ochre grave)	KM 37962:791
Rahakangas 1	Hela-2818	5328±47	-25,70	**6200-6000**	**6110**	burnt bone (fish)	KM 38399:81, 85
Rahakangas 1	Hela-2819	4577±44	-27,30	**5440-5060**	**5280**	burnt bone (pine marten)	KM 37962:528, 535, 548, 567, 591, 598, 602
Rahakangas 1	Ua-44895	4533±45	-25,80	**5320-5050**	**5160**	charcoal (housepit)	
Rahakangas 1	Hela-2817	4218±41	-26,00	**4850-4650**	**4740**	burnt bone (fish)	KM 37962:591, 602
Rahakangas 1	Hela-2719	1298±30	-26,10	**1290-1170**	**1230**	burnt bone (fish)	KM 37962:395
Alimmaisen Päälamminjoki	Ua-41022	6912±50	-23,10	**7790-7680**	**7740**	burnt bone (beaver)	KM 35415
Kinnulanvaara	Ua-41021	6986±41	-22,10	**7930-7750**	**7820**	burnt bone (elk)	KM 35347:2
Lentokenttä 3	Ua-41026	8266±59	-27,40	**9410-9130**	**9250**	burnt bone (beaver)	KM 38480:5
Lähdeahonkalliot 1	Ua-41023	6686±50	-25,70	**7610-7500**	**7550**	burnt bone (reindeer)	KM 38454:6
Lähteensuo 3	Ua-41025	8528±49	-27,80	**9540-9480**	**9510**	burnt bone (mammal)	KM 38473:3
Valkeislampi koillinen 2	Ua-41024	8716±49	-26,80	**9730-9550**	**9670**	burnt bone (mammal)	KM 38463:5

Figure 6.1. Key locations mentioned in the text and the radiocarbon determinations for the sites studied by the Earliest pioneer settlement in Eastern Finland project. Original publications: Pesonen et al. 2014; Tallavaara et al. 2014. Maps M. A. Manninen.

after, the potential of the Sarvinki area for finding early postglacial sites became even clearer when an Eurasian elk bone from the nearby Rahakangas 1 site was radiocarbon dated to the Early Mesolithic (Pesonen 2005).

Around the time of the publication of the initial Lake Sarvinki finds, an archive survey of the collections of the National Museum of Finland, conducted as part of the *Interfaces in the Mesolithic Stone Age of Eastern Fennoscandia* project (Rankama 2011), revealed a set of flint blade artefacts from North Karelia, which had ended up in the collections when knowledge of their Early Mesolithic affiliation was still lacking (Hertell & Manninen 2006; Manninen & Hertell 2011). This included finds from the

transgressed Syväys 1 site, where a considerable number of flint blades had been collected. As a result, a survey of old sites with blade finds, coupled with a search for new Mesolithic sites in the Lake Koitere area in Ilomantsi and Lieksa, was conducted in 2005 by Hertell, Manninen and Tallavaara with the aim to "*possibly find new Mesolithic sites in the area and to get acquainted with the region for the purpose of future studies*" (Hertell & Manninen 2005). It had become clear at this point that North Karelia had much to offer for the research of the Early Mesolithic pioneer colonization of Fennoscandia.

6.1.2 Earliest pioneer settlement in Eastern Finland

Soon after this preliminary work, the researchers investigating the earliest postglacial settlement of North Karelia joined forces, and the project *Earliest pioneer settlement in Eastern Finland* was launched. This project ran for several years on short-term, targeted fieldwork budgets separately acquired from different local funding bodies for each excavation or survey season. The generally small size of the pioneer settlement sites and the participation of motivated researchers and students on a voluntary basis allowed the careful excavation of select sites over the course of short field seasons, which rarely exceeded two weeks in duration. The first fieldwork campaign started in 2009 with excavations at the Rahakangas 1 site in Sarvinki, where a small housepit had been discovered during the 2003 survey (Forsberg et al. 2009; Pesonen 2005). Excavations at Rahakangas 1 were continued in 2010, and test excavations were conducted at the Jokivarsi 1 and Kaiskunsärkkä 1 sites, also located along the former shores of Lake Sarvinki. In 2011–2012, excavations were continued in Jokivarsi 1. In addition, funding was granted for a survey of Mesolithic sites in the Vieki region, Lieksa, in 2010–2011, where more Early Mesolithic sites were expected to be found (Pesonen et al. 2010a).

Over the years, the archaeological team of these projects included several members, listed here in alphabetical order: Esa Hertell, Eeva Jonsson, Kristiina Mannermaa, Mikael A. Manninen, Mikael Nyholm, Jukka Palm, Petro Pesonen, Tapani Rostedt, Johanna Seppä, Laija Simponen(-Robins), Noora Taipale, and Miikka Tallavaara. There were three to nine of us present in the field at the same time. The services of Helsinki and Uppsala radiocarbon-dating laboratories were used for radiocarbon age determinations of a total of 21 samples. As an extension to the Jokivarsi 1 excavation, funding was also secured to conduct mineralogical analyses on lidite artefacts from the site. In addition to the project members, Pasi Heikkilä and Niko Anttiroiko (then at the University of Helsinki) and Alexey Tarasov (Karelian Research Centre of the Russian Academy of Sciences) were engaged in this branch of research.

Over the years, this voluntary work resulted in substantial additions to the archaeology of the Mesolithic in Finland. Two sites were excavated, one test excavated and altogether 37 previously unknown Mesolithic sites discovered. The projects' results were introduced in various conferences and publications, with the main emphasis on the Sarvinki sites. In this paper, the results and achievements of these projects are summarised. On the basis of the experience gathered over the course of this work, we make some notes on the prospects of such interest-driven investigations in general.

6.2 Environmental setting of Mesolithic North Karelia

The natural environment during the Early Mesolithic settling of North Karelia is discussed in detail elsewhere (Manninen et al. 2018; Pesonen et al. 2011; 2014; Tallavaara et al. 2014). The Baltic Sea basin has evolved through successive sea phases, known as the Baltic Ice Lake, the Yoldia Sea, the

Figure 6.2. A – Jukka Palm and Noora Taipale taking soil samples from the 2011 excavation area at Jokivarsi 1. B – The Jokivarsi 1 excavations in 2011. From front to back: Miikka Tallavaara, Esa Hertell, Jukka Palm, Laija Simponen, Mikael Nyholm and Noora Taipale. C – The Jokivarsi 1 site during excavations in 2011. The location of the former Lake Sarvinki is indicated by the cultivated fields on the left. D – Backfilling the 2010 dig at Rahakangas. From left to right: Noora Taipale, Jukka Palm, Mikael Nyholm and Laija Simponen. E – The red-ochre grave at Rahakangas 1. F – Miikka Tallavaara and Esa Hertell inspecting the partly submerged Syväys 1 site, Lake Koitere, Ilomantsi, in 2005. G – Esa Hertell at the Lähdeahonkalliot area in Vieki, Lieksa, during the 2010 survey. Photos M. A. Manninen & P. Pesonen.

Ancylus Lake and the Littorina Sea. Lake Sarvinki was probably originally an ice lake, formed during the retreat of the Scandinavian ice sheet from the Salpausselkä II end moraine (Saarnisto & Saarinen 2001). The ancient level of Lake Sarvinki is higher than the highest shoreline of the Baltic Sea and thus it has never been part of any bigger basin. Settlers found their way to the shores of the small lake, which flowed to the Yoldia Sea via Lake Jakojärvi. The shores of the Yoldia Sea may have been too hostile for human occupation at the time, with the edge of the retreating ice sheet located only a few hundred kilometres to the north-west (Tallavaara et al. 2014). The first vegetation after the retreat of the ice was probably grasses and shrubs, a tundra-steppe vegetation which soon, however, turned into heaths dominated by willow-like species.

The pioneer occupation in Sarvinki and North Karelia took place in the birch-dominated Late Preboreal vegetation phase, which in a few centuries turned into a pine-dominant Boreal phase with an established Mesolithic population. Lake Sarvinki continued its existence in the Holocene, with minor tilting to the southeast until its draining in 1743. The Vieki area is located in the north-eastern part of Lake Pielinen. In our surveys, Mesolithic sites were found in the sandy heath forest area by the steep canyons of River Viekijoki flowing to Lake Viekijärvi in the south (Pesonen et al. 2010a). Many of the sites were originally located on the shores of ancient Lake Pielinen, which was much larger during the Early Holocene. The sites are on palaeoshore formations at different altitudes, thus illustrating the long history of the lake.

6.3 Results of the projects

6.3.1 Early Mesolithic pioneers in Sarvinki

Excavations at the Rahakangas 1 site culminated in the discovery of a red-ochre grave under the floor of the excavated housepit. With a size of 70 x 40 cm and teeth remains belonging to a child or juvenile, the grave was interpreted as a grave of a child. From the filling of the grave, a charcoal sample gave a Late Mesolithic radiocarbon date (8500 calBP; Hela-2379; Pesonen et al. 2014; Pesonen et al. 2010b; Simponen et al. 2011)[1] and a charcoal sample from probable house wall remains gave a Late Neolithic date (5160 calBP; Ua-44895). These dates are not in contradiction, but the date from the filling is *terminus post quem* at best; therefore, it is possible that the grave and the housepit are coeval (Simponen 2014).

Thanks to the generous funding the project received, it was possible to obtain radiocarbon dates on the excavated material. The majority of these derive from the Rahakangas 1 excavations, but several samples from Jokivarsi 1 and a number of Vieki sites were also dated. Among the results, there is a set of earliest radiocarbon dates from eastern Fennoscandia, paralleled only by Early Mesolithic dates from the Orimattila and Joutseno regions (Jussila et al. 2012; Takala 2004). Currently, the earliest radiocarbon date from an archaeological context in Finland is a Late Preboreal date on a piece of birch bark pitch (probable hafting glue) from the Jokivarsi 1 excavations (10 920 calBP; Hela-2947; Fig. 6.1).

Excavations in Sarvinki produced assemblages of calcined bone fragments. At Jokivarsi 1, approximately 500 grams (2577 fragments) and at Rahakangas 1 roughly 900 grams (>9500 fragments) of bone material were collected. The Eurasian elk is the only species identified at Jokivarsi 1 (Pesonen 2014; Simponen et al. 2015), whereas Rahakangas 1 presents a broader range of species (Pesonen et al. 2011). In addition to Eurasian elk, Eurasian beaver, pine marten, northern pike, European perch, common whitefish and several bird genera (*Lagopus* sp and *Gavia* sp) were also identified. As Rahakan-

[1] In the text, calibrations are presented as median values. Median and 68.3% HPD region values are given in the table in Fig. 6.1. Calibration was done with Oxcal v. 4.4.4 (Bronk Ramsey 2009) and atmospheric data is taken from Reimer et al. 2020.

gas 1 represents a site with multiple occupation phases, the bones may date to different periods. The Eurasian elk could be connected to the Early Mesolithic occupation phase and the Eurasian beaver to the Late Mesolithic. The unidentified fish fragments originate from the Early Metal Period.

The Palaeolithic and Mesolithic were golden ages for bone, antler and wood working; most tools and vessels were made of these materials. Several tiny artefact fragments – some of which were ornamented – were found in the bone assemblage of Jokivarsi 1 (Fig. 6.3f). Although it is impossible to reconstruct what kind of artefacts they originate from, these tiny pieces deriving from the earliest site in Finland are valuable indicators of a fine bone handicraft tradition, which evidently flourished here almost 11,000 years ago. This tradition is well known from neighbouring areas where bone preservation is better.

The Rahakangas 1 and Jokivarsi 1 excavations yielded small assemblages of flint blade artefacts, which are of special interest as flint does not occur naturally in Finland (Hertell & Tallavaara 2011). A total of 1712 lithic artefacts were found at Rahakangas 1, of which 50 were flint, the rest being quartz, while the Jokivarsi 1 excavations yielded 4880 lithic artefacts, of which 412 were flint and the rest quartz and lidite-chert (Fig. 6.3). Among the Rahakangas 1 flint finds, seven are diagnostic blade artefacts (Pesonen et al. 2014; Hertell & Pesonen 2011), while at Jokivarsi 1 that number is 57. The flint assemblage of Jokivarsi 1 suggests a *chaîne opératoire* where ready-made blades and blade tools were brought to the site alongside depleted or nearly depleted blade cores finished at the site using bipolar-on-anvil reduction. Altogether eight bipolar cores are present, one of which still shows remnants of a blade core face. The flint artefacts include 13 scrapers, of which seven are diagnostic endscrapers on blades, 17 blades or blade fragments with marginal retouch, and four burins and borers on blades. In addition, there are 22 flint tools or tool fragments on flakes or undetermined blanks (Manninen, unpublished analysis).

Analyses on a sample of black lithic artefacts from Jokivarsi 1 (Fig. 6.3d), visually determined as lidite-chert-bearing rocks, were conducted in the Mineralogical Laboratory of the Department of Geosciences and Geography of the University of Helsinki using a variety of petrological laboratory methods. Comparisons with a set of reference samples revealed that the Jokivarsi 1 samples in many respects resemble lidite-chert samples from the Lake Onega deposits in Russian Karelia, while one of the samples was shown to contain lidite in thin-section petrography, a sign pinpointing the sample to the Zaonega formation (the sole origin of shungite/lidite in this part of the world) located on the northern shores of Lake Onega (Manninen et al. 2016; Tarasov et al. 2017). The result indicates that some of the raw material used at Jokivarsi 1 originates from this region, and thus it also serves as an indirect indication of the earliest postglacial human activity in the area of the Zaonega formation known to date (Tarasov et al. 2017).

6.3.2 New Mesolithic sites around Vieki

The Vieki survey concentrated on locating Mesolithic sites in an area where their survival was optimal in light of the mostly regressive shoreline history. Our aims were to find sites with burnt bones that could be radiocarbon dated, and to measure the altitude of these sites to improve the shoreline displacement chronology in the area. During the survey, we were able to detect a total of 34 new prehistoric sites, with the most interesting ones located on the ancient shores of Lake Pielinen. Despite our efforts, only four of the newly identified sites yielded a sufficient amount of burnt bone for radiocarbon dating (Fig. 6.1). In addition, we dated two previously discovered Mesolithic sites in Lieksa outside the Vieki area. Three of the Vieki sites yielded Early Mesolithic dates, the earliest one being Valkeislampi koillinen 2, 9670 calBP at 128.35 meters above sea level (m.a.s.l.). However,

Figure 6.3. Find distribution map from the 2011–2012 Jokivarsi 1 excavation (green dots indicate finds, grey areas indicate organically stained soil, interval between surface contours is 10 cm) and a sample of finds: A – endscrapers on flint blade. B – flint blades and retouched blades. C – flint bipolar-on-anvil cores. D – flakes and tools in black chert, of which some contain lidite. E – quartz flakes. F – fragment of a burnt bone artefact. G – piece of birch bark pitch. Photos and image composition M. A. Manninen. Map P. Pesonen.

a number of Vieki sites are located above this altitude, which points to much earlier habitation in the region. For example, the elevations of the sites Lähdeahonkangas 2 and Valkeislampi koillinen 1 (138.9 and 138.5 m.a.s.l., respectively) suggest that they were potentially located on the shores of the Pielinen–Sotkamo ice-dammed lake.

Lake Pielinen began its postglacial history as an ice-dammed lake. At its maximum stage, Pielinen was connected to the Sotkamo ice-dammed lake, and they formed a 200 km-long twin basin of 3975 km^2 (Seppä et al. 2012). In the Vieki area, the shorelines of the ice-dammed lake are located between 136 and 138 m.a.s.l. (Miettinen 1994; 1996).

The onset of the isolated Lake Pielinen is defined by the draining of the massive Pielinen–Sotkamo ice-dammed lake through the outlet in Kattilanmäki, close to Kajaani. Seppä et al. (2012) have estimated that this draining event occurred ca. 11 300 years ago, while more recent deglaciation chronology (Stroeven et al. 2016) suggests that the ice margin passed the Kattilanmäki threshold between 10 700 and 10 600 years ago. These dates provide a *terminus ante quem* age for shorelines located above 136 m.a.s.l. in the Vieki area and, consequently, for archaeological sites situated above these shorelines.

All this suggests that Lähdeahonkangas 2 and Valkeislampi koillinen 1, if truly located on the shores of the ice-dammed lake, are among the earliest archaeological sites in Finland and potentially even older than the Jokivarsi 1 site in Sarvinki. However, this remains hypothetical until the sites are properly radiocarbon dated. The possibility that humans were roaming the shores of a challenging and unstable ice-dammed lake is nevertheless intriguing and would reflect the high adaptability of the early pioneers.

6.4 Conclusions: On the importance of small-scale projects in the archaeological research of Mesolithic North Karelia

In our view, the combined individual small-scale, voluntary-based projects, each equipped with fairly light resources, as a whole succeeded in making notable contributions to the Mesolithic archaeology of Northern Europe. The most important results of the campaigns can be summarized as follows:

1. Thirty-seven previously unknown Mesolithic sites were discovered. They verify the arrival and succession of Mesolithic settlement in the Vieki area near Lake Pielinen and allow the reconstruction of a tentative shoreline chronology for the area.
2. The early radiocarbon dates from Jokivarsi 1 and Rahakangas 1 currently give a timeline for the earliest postglacial occupation of eastern Fennoscandia and demonstrate that humans arrived in easternmost Finland ca. 11 000 calBP in tandem with the spread of the postglacial birch forest zone.
3. A red-ochre grave with preserved tooth enamel was discovered at Rahakangas 1.
4. Faunal remains indicate the importance of the Eurasian elk in the economy of the early pioneers.
5. The lithic record documents Early Mesolithic use of exotic lithic raw materials originating several hundred kilometres away, including flint blade technology and lidite-chert, alongside raw materials of a more local origin.
6. Indications of living structures and intra-site structurality observed at Rahakangas 1 and Jokivarsi 1 will in the future allow the study of the spatial organisation of activities at and around dwellings.

These achievements demonstrate that extensive long-term funding is not always necessary for obtaining significant archaeological results. Instead, small project budgets can combine into a meaningful research design in the longer term. Our ambition here was to tackle one major research question – that of the earliest postglacial settlement of North Karelia and, by extension, eastern Fennoscandia – through a series of individual, short-term research projects. The experience and interest-driven dedication of the team members and collaborators, as well as resourceful acquisition and use of funding, enabled the collection of high-resolution data with far-reaching implications. The excavation of key sites and the surveys conducted in the broader region, coupled with laboratory analyses that supported the main research questions, succeeded in putting North Karelia on the map of Early Mesolithic Europe.

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