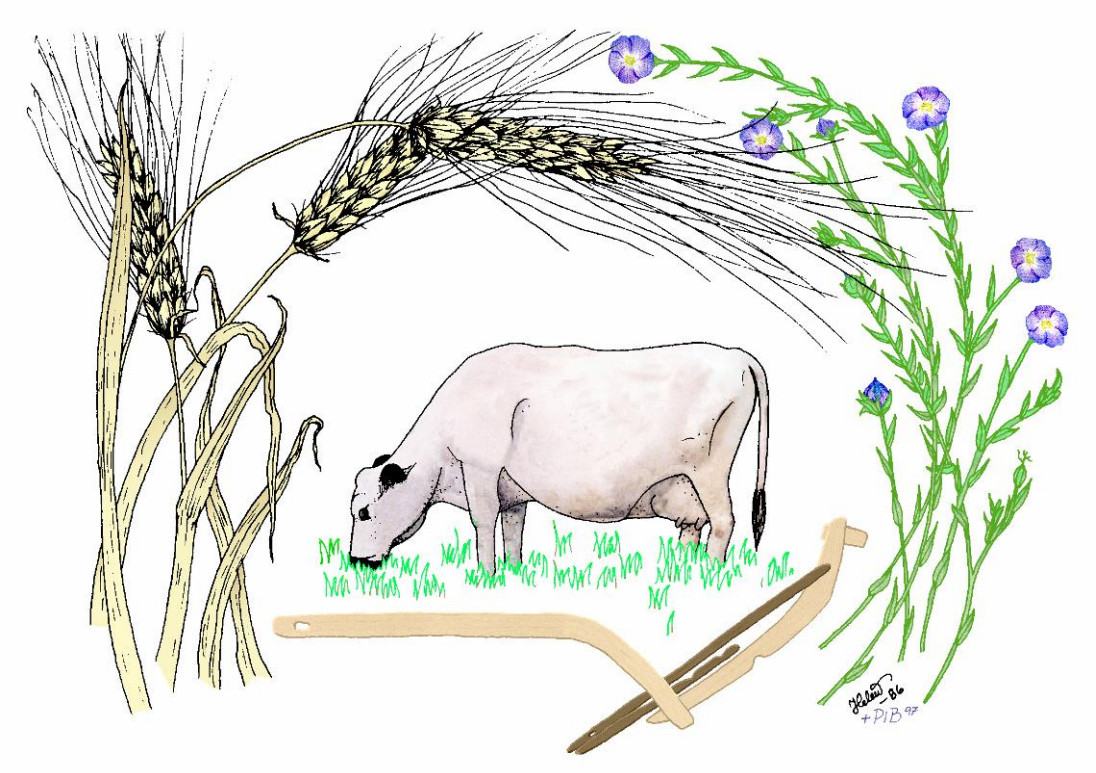
MILJÖARKEOLOGISKA LABORATORIET

RAPPORT nr. 2020-022



Macrofossil analysis of four sample from four contexts from Långbergsöda socken, Saltvik kommun, Åland

Ivanka Hristova & Samuel Eriksson

INSTITUTIONEN FÖR IDÉ – OCH SAMHÄLLSSTUDIER

UMEÅ UNIVERSITET

Macrofossil analysis of four sample from four contexts from Långbergsöda socken, Saltvik kommun, Åland

Ivanka Hristova & Samuel Eriksson

Introduction

Four macrofossil samples from the excavations of three sites: Fornlämning Sa 20.8 Myrsbacka, Fornlämningen Sa 20.8 Svinvallen, and Fornlämningen Sa 20.1 Orrdalskärret in Långbergsöda Socken have been analysed at the Environmental Archaeology Laboratory (MAL) at Umeå University.

There is a sequence of Neolithic settlements from the earliest archaeological evidence in Åland, about 5500 BC, to the Bronze Age in the village of Långbergsöda.

Fornlämningen Sa 20.8 Myrsbacka, ÅM 808: 470

Sa 20.8 Myrsbacka is a Late Neolithic settlement with presence of so-called Kiukaiskeramik which came from the mainland of Finland. The site follows chronologically and topographically the pitted ware site Svinvallen, which attests cultural contacts. The Kiukais sites are usually characterized as distinctly maritime, while the GRK sites in Åland contain Finland's oldest cerealia, so an archaeobotanical analysis of the material from the Myrsbacka sample is interesting from that aspect.

The soil sample comes from a pit with dark cultural layers and a lot of Kiukai-type ceramics, from the central part of the settlement.

Fornlämningen Sa 20.8 Svinvallen, ÅM 808: 129 b

Sa 20,8 Svinvallen is a pitted ware site surrounded by two coasts, one on the east and another one on the west. There are finds of Cerealia from the eastern shore, while the information from the western shore, from where the provided for analyses sample come from, is quite scarce.

The sample was taken from the profile in sample pit 59 on the western shore, in connection with the discovery of a miniature vessel with a flat-bottomed. The vessel was the only find in the sample square, which raises the question whether it is from the former settlement or from the (shore) water? It will be interesting if more information about the vessel content could be obtained.

Fornlämningen Sa 20.1 Orrdalskärret, ÅM 814

Sa 20.1 Orrdalskärret is one of the earliest Comb ceramic settlements in Åland. According to the typology and shoreline displacement, the site was dated to about 5000 BC. One of the samples was taken from the western profile of a hearth A1, about 40 cm deep below the ground surface, towards the bottom. The hearth was edged with fire cracked stones to the parts visible

in the sample pit. The second sample came from a settlement structure (PG 5 and surrounding areas) with distinct cultural layer and a lot of fragmented fish bones.

The main purpose is to compare the obtained results with the previous ones from contemporary sites from the region (for example Sa 2.21) and if possible to find out during which season the site was utilized. The soil chemical results needs to be compared with previous ones, as well as to receive information about the supposedly charcoal-rich hearth feature in A1 and the settlement structure.

The sample was sent by Jenni Lucenius, Ålands landskapsregering, kulturbyrån.

Materials and Methods

Soil chemistry

Prior to all analyses the samples were dried at 30°C. Samples were then passed through a 1.25 mm sieve and any presence of material of cultural significance noted (such as bone, charred material, ceramics etc.). The chemical methods employed here are the same as those used in Swedish soil chemical studies following the methodological approach of Engelmark and Linderholm (2008). The parameters analysed and abbreviations used are explained in Table 1.

Table 1. Geoarchaeological methods and abbreviations as used in this report.

Abbreviation	Method	Description
MS	Magnetic Susceptibility	Magnetic susceptibility measured on 10g of soil, with a Bartington MS3 system with an MS2B probe (Dearing 1994). Data are reported as SI-units per ten grams of soil, (corresponding to X_{lf}, 10^{-8} m^3 kg^{-1}) (Thompson & Oldfield 1986).
MS550	Magnetic Susceptibility after burning at 550ºC	Magnetic susceptibility after 550° C ignition (units as above)
LOI (%)	Loss On Ignition	Soil organic matter, determined by loss on ignition at 550° C, in percent (Carter, 1993).
Cit-P	Inorganic phosphate content (mg P/kg dry matter, ppm)	Extraction with 2% citric acid (corresponding to the Arrhenius method (Arrhenius 1934)
Cit-POI	Total phosphate (mg P/kg dry matter, ppm) (inorganic & organic)	Extraction with 2% citric acid on ignited soil
P quota	**Cit-POI /Cit-P**	Ratio of inorganic & organic to inorganic phosphate

These methods have been developed and adapted for soil prospection and the bulk analysis of occupation soils and features. Analysed parameters comprise organic matter (loss on ignition [LOI], Carter 1993), two fractions of phosphate (inorganic [Cit-P], and sum of organic and inorganic [Cit-POI]) (Engelmark and Linderholm 2008, Linderholm 2007) and magnetic susceptibility (MS-χ_{lf}) and MS550-χ_{lf} (Linderholm 2007, Engelmark and Linderholm 2008).

These analyses provide information on various aspects concerning phosphate, iron and other magnetic components and total organic matter in soils and sediments, and their relationship to phosphate.

Macrofossil analysis

Before the analysis the samples were stored in a drying room (+30°) until the moisture has disappeared. Afterwards they were floated using sieve meshes of 2 mm and 0,5 mm. The samples volume before floatation was between 0,4 and 5,4 liter and after it between 2 and 200 ml. The sieved material was sorted and identified under stereomicroscope. Charred/carbonised plant remains were extracted from the sample and the results from the analysis are presented in Table 1. The amount of woody charcoal was estimated as relative proportion of the floated sample volume as follows: x = up to 25%, xx = up to 50%, xxx = up to 75%, xxxx = about 100% of floated sample volume. The identification of plant species was done using reference literature (Cappers, Bekker, & Jans, 2006) as well as the laboratory reference collection. The names of the identified plants are given according to the Nordens flora (Mossberg and Stenberg 2018) and the Virtual Flora (Anderberg and Anderberg, u.d.). Swedish names of the identified plants are included in Table 3.

Sample processing was performed by Kristian Hristov, further analysis and species identification by Ivanka Hristova.

Results

Sample 20_0002_0001, Sa 20.8 Myrsbacka, ÅM 808: 470

The volume of the sample before floatation was 1,8 liters and after floatation 40 ml. the estimated amount of charcoals is about 25% of floated volume. The rest of the sample contained mainly modern roots/ stems. The identified plant remains are cereals presented by barley (*Hordeum vulgare*) and fragmented cereal grains that cannot be identified to species level. Additionally ten ceramic fragments were found during the floatation and sorting of the sample, two of them about 5x7 cm in size. Four black slag like fragments were also selected.

Sample 20_0002_0002, Sa 20.8 Svinvallen, ÅM 808: 129 b

The sample volume before flotation was 0,4 liter and after – 2 ml. No charcoal fragments were preserved in the sample. The only preserved plant remain was a fragment of spruce needle (*Picea abies*).

Sample 20_0002_0003, Sa 20.1 Orrdalskärret, ÅM 814, JP 13

Stones and charcoals were visible in the sample before the floatation. Its volume before flotation was 1,8 liters and after it was 200 ml. The sample was comprised entirely of charcoal fragments. One charcoal fragment selected and weighed or 14 C dating was determined as willow/ poplar (*Salix/ Populus*). No other plant remains were found in the sample.

Sample 20_0002_0004, Sa 20.1 Orrdalskärret, ÅM 814, JP 3

The sample volume before floatation was 5,4 liters and after – 150 ml. The amount of charcoals was about 25% of the floated volume. The rest of the sample contained modern roots/ stems. During the floatation a ceramic fragment with decoration about 5x5 cm in size was found. The registered plant remains were few fragments of hazelnut shells (*Corylus avellana*) and spruce needles (*Picea abies*).

Table 2. Results of soil chemical and physical analysis

MALNo	FieldNo	FeatureNo	MSlf	MS550lf	CitP	CitPOI	PQuota	LOI
20_0002_0001	JP 9	ÅM 808:470	6	6	44	92	2,1	1,4
20_0002_0002		ÅM 808:129 b	11	10	205	245	1,2	1,0
20_0002_0003	JP 13	ÅM 814	353	520	152	269	1,8	8,2
20_0002_0004	JP 3	ÅM 814	326	279	284	425	1,5	3,6

Discussion and Conclusions

Fornlämningen Sa 20.8 Myrsbacka, ÅM 808: 470

The found plant material at the site contains cereals. The only identified cereal crop was barley which is the main crop, especially the naked one, in the region for the studied period. One part of the cereal finds are quite fragmented but as only barley was identified could be inferred that all the cereals are barley. The found ceramic fragments coincides with the other findings from the site.

The soil chemistry indicates very low cultural impact in terms of phosphate accumulation.

Fornlämningen Sa 20.8 Svinvallen, ÅM 808: 129 b

The only archaeobotanical finding from the sample is a spruce needle fragment which proves it presence at the site but it is quite scarce to allow any further interpretation. No charcoals were registered in the sample which shows the lack of burning activities.

The soil chemistry indicates low to medium cultural impact in terms of phosphate accumulation.

Fornlämningen Sa 20.1 Orrdalskärret, ÅM 814

Two samples were analysed from the site: one from a hearth and one from a settlement structure. The sample from the hearth contains entirely charcoal fragments which coincides with the studied structure. Only one fragment of charcoal was identified and determined as willow/ poplar, which is not enough to give information about the surrounding wood vegetation and/ or preferred wood for the fire. The lack of other preserved plants do not allow any further interpretations of the sample.
The sample from the settlement structure consist of hazelnut shell fragments and spruce needles. Those are quite common finding and represents the local environment as well as the use of those plants by the ancient population. Spruce needles were found in another sites from Långbergsöda (Sa 20.7 Alkärr/Tisdal). The archaeobotanical material from the site Sa 2.21, Bertby is represented mainly by charcoals and discusses the woodland vegetation which according to the analyses was dominated by juniper.

The soil chemistry in both samples indicates low to medium cultural impact in terms of phosphate accumulation. The result for MS shows that the material in sample JP3 is likely more affected by heat, this could indicate that the material has been a primary recipient in a heat related process, such as in a hearth or oven.

References

Anderberg, A.-L., & Anderberg, A. (u.d.). Den virtuella floran. Hämtat från http://linnaeus.nrm.se/flora/welcome.html

Cappers, R. T., Bekker, R. M., Jans, E. J. 2006. Digitale Zadenatlas van Nederland. Digital seed atlas of the Netherlands. Groningen: Barkhuis publishing & Groningen University Library.

Mossberg, B., Stenberg, S. 2018. Nordens flora. Naturhistoriska riksmuseet Stockholm.

Carter, M.R. 1993. *Soil Sampling and Methods of Analysis*. London.

Dearing, J. 1994. Environmental Magnetic Susceptibility. Using the Bartington System. Bartington Instruments Ltd.

Engelmark, R., Linderholm, J. 2008. *Miljöarkeologi: människa och landskap - en komplicerad dynamik.* Malmö: Malmö kulturmiljö.

Linderholm, J. 2007. Soil chemical surveying: a path to a deeper understanding of prehistoric sites and societies in Sweden. Geoarchaeology 22 (4), 417–438.

Thompson, R. and Oldfield, F. (1986) *Environmental Magnetism*. Allen & Unwin: Springer, London.

Figures and tables

MAL nr	Prov nr	Feature	Cerealia	*Corylus avellana* (hazel/hassel)	*Hordeum vulgare* (barley/korn)	*Picea abies* (spruce/gran)	Indet	Charcoal	Ceramics	black slag	volume before floatation (L)	volume after floatation (ml)
20_0002_0001	JP 9	ÅM 808:470	7		2		1	x	10	4	1, 8	40
20_0002_0002		ÅM 808:129 b				1		no			0,4	2
20_0002_0003	JP 13	ÅM 814						xxxx			1,8	200
20_0002_0004	JP 3	ÅM 814		3		3		x	1		5,4	150

Table 3. Archaeobotanical results from the studied structures.

MAL
Miljöarkeologiska laboratoriet
Umeå Universitet
901 87 UMEÅ
090-786 50 00
www.umu.se/envarchlab
mal@umu.se

Jan-Erik Wallin Pollenlaboratoriet i Umeå AB
Sågställarvägen 2A 907 42 Umeå
070-66 15 101
pollenlaboratoriet@ume.se