

# The value of stallions and mares during the Early Medieval time in upper class Svealand

## Molecular sex identifications on horse remains from Vendel and Eketorp

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The importance of horses in the pre-Christian cult in central Svealand is well known and has generated some interest. However, the sex of the horses involved has rarely been discussed. Here I present a new method for sexing archaeological horse remains and briefly discuss the importance the sex of the horse may have had in Early Medieval central Svealand.

### Introduction

The horse played an important part in north European prehistory, in pre-Christian as well as in Christian time, although it was removed from the cult in Christian times (Ropeid 1962). However, Gotlandic picture stones and sacrificial finds indicate that the horse was important for the ideology in pre-Christian time. The pagan communion, where horsemeat seems to have played an important role, certainly served ideological purposes (Backe et al. 1993). The horse also served practical purposes such as transportation (Krüger 1995) and in war (Engström 1994). One way to examine the importance of the horse, different horse breeds and perhaps even stallions vs. mares is to study horse remains from recognized settings. The setting provides information on how the buried horses were valued, i.e. if we assume that horses were valued as highly as artefacts deposited in “high status” burials.

The importance of the sex of the horse has been discussed earlier. Geldings were for example, present in the depositions connected to Childeric's grave (Brulet & Vêche 1990), and this find, and others similar, led Joachim Werner (1992) to conclude that geldings were valuable riding horses.

Horse remains are usually sex identified by certain morphological traits on teeth and the hip bone (Nickel et al. 1961, Ambrose & Müller 1980). This is a cheap, fast and reliable method, but specific skeletal elements have to be preserved in order to make a successful identification. Here two molecular markers have been used to sex identify the remains. One based on the X-chromosomal amelogenin sequence with its Y-chromosomal homologue and one based on the SRY gene (Hasegawa

et al. 2000). A drawback with this method is that it cannot discriminate between geldings and stallions. Turning a stallion into a gelding is a process that has nothing to do with the genome and it will not be visible in the X- or Y-chromosome. The problem concerning different values of different horse breeds has also been recognised, but not thoroughly examined, in Scandinavia (Lidén et al. 1998). In this paper I intend to study whether a specific sex was preferred and how it was valued in two different Early Medieval settings.

Two sets of horse remains were used in this study, one from a sacrificial context and one from a high society cemetery. The horses from the sacrificial context date to the later part of the first millennium AD, and are believed to be the remnants of a pagan communion (Backe et al. 1993). The remains were found just outside the walls of the fortified village Eketorp on southern Öland (fig. 1). The second set is from the boat cemetery in Vendel, central Svealand (fig. 1). The quality of the contents of the 14 graves is such that it is clear that the cemetery was used by members of the upper class (Arbman 1938, Arrhenius 1983, Lidén et al. 2001). As a matter of fact, the high quality of the horse equipment deposited in the graves is one of the strongest indicators of the status of the cemetery. These horses might have served an ideological purpose in both circumstances. In Vendel they probably served to mark the status of the buried, either in the living society or in the dead world. In the case of Eketorp the purpose was probably the same, either to show status by sacrifices or to gain benefits from higher powers through sacrifices. In either case it is most likely that high quality horses were used since low quality horses would not have served any of the purposes.

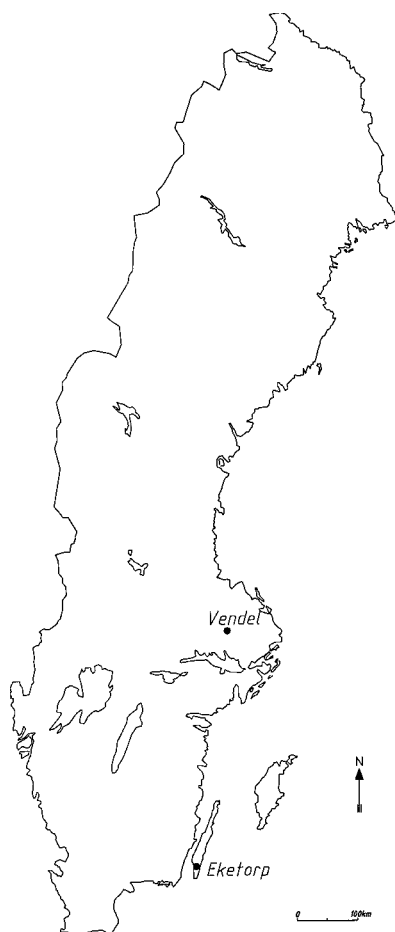


Figure 1. Two Early Medieval sites in Sweden from which 28 horses were sex identified. The boat cemetery in Vendel in central Svealand and the fortified village Eketorp on southern Öland are marked on the map.

Thus, if there were a strong overrepresentation of male horses in these settings, this would indicate that stallions or geldings were valued more highly than mares by those participating in the ritual. If there were an equally strong presence of male and female horses it would mean that those involved in the ritual had stronger criteria for valuation than sex, perhaps capability or breed.

## Material

Horse teeth, one from each individual, were used for DNA extraction. The first set of horse teeth is from a water hole outside the walls of the fortified village Eketorp on southern Öland (fig. 1). No finds were associated with them, but the bones represent such parts of a horse that they could be “left-over” from a horse-based meal. They have been dated to the later part of the first millennium AD (Backe et al. 1993). Seven teeth were used from this site (table 1). The second set of horse teeth is from the boat cemetery in Vendel, central Svealand (fig. 1). The cemetery, with its 14 graves, spans over a time of 500 years from the Migration period to the late Viking period (Arrhenius 1983). Horses

Table 1. 28 horse teeth from two different Early Medieval sites in Sweden were sex identified with two different PCR systems. All SRY products and female amelogenin products were sequenced. The results indicate that out of the 28 samples, at least 10 were male and 5 female. Mares as well as stallions were present at both sites. The total number of horses deposited in each burial is indicated in the brackets: Vendel I (3), Vendel II (1), Vendel III (3), Vendel IV (at least 1), Vendel V (at least 1), Vendel VI (1), Vendel VII (5), Vendel VIII(2), Vendel IX (2), Vendel X (1), Vendel XI (3), Vendel XII (2), Vendel XIII (2) and Vendel XIV (1) (Stolpe & Arne, 1927).

Sample	Site	Dating	Amelogenin	SRY
1	Eketorp	500–1000 AD	Male	Male
2	Eketorp	500–1000 AD	–	–
3	Eketorp	500–1000 AD	Male	Male
4	Eketorp	500–1000 AD	Male	Male
5	Eketorp	500–1000 AD	Female	–
6	Eketorp	500–1000 AD	–	–
7	Eketorp	500–1000 AD	Male	Male
8	Vendel I	600–640 AD	–	–
9	Vendel I	600–640 AD	Female	–
10	Vendel III	720–750 AD	Male	Male
11	Vendel III	720–750 AD	Male	Male
12	Vendel III	720–750 AD	Male	Male
13	Vendel IV	800–850 AD	–	–
14	Vendel VI	850–900 AD	Male	Male
15	Vendel VII	630/40–720 AD	Male	Male
16	Vendel VII	630/40–720 AD	Female	–
17	Vendel VII	630/40–720 AD	–	–
18	Vendel VII	630/40–720 AD	Female	–
19	Vendel VIII	850 AD	Male	Male
20	Vendel IX	950 AD	–	–
21	Vendel IX	950 AD	–	–
22	Vendel X	560/70–600 AD	Female	–
23	Vendel XI	560/70–600 AD	–	–
24	Vendel XI	560/70–600 AD	–	–
25	Vendel XII	560/70–600 AD	–	–
26	Vendel XII	560/70–600 AD	–	–
27	Vendel XIII	1000 AD	–	–
28	Vendel XIV	560/70–600 AD	–	–

from 12 of the graves were used (I, III, IV, VI, VII, VIII, IX, X, XI, XII, XIII and XIV). The grave contents clearly indicate that it was a cemetery belonging to the upper strata of the society and the finds are of the highest quality (Arbman 1938, Arrhenius 1983). Twenty-one horse teeth were used from this site (table 1). The number of horses deposited in the boat burials in Vendel varies between one and five (table 1).

## Methods

The amelogenin homologue on the X- and Y-chromosomes and a fragment of the SRY gene were used for sex identification (Hasegawa et al. 2000). One primer pair (HORSEAM1 5'CACTTCCTGGCCAACAC3' and HORSEAM2 5'GGGTAGGTCGGAGTCCGG3') was designed for the amelogenin sequences on the two sex chromosomes. The two primers amplify a 127 bp fragment from the X-chromosome and a 103 bp fragment from the Y-chromosome. Thus, in a male sample there should be one long and one short product after PCR and in a female sample there should be one long product after PCR. In all cases where a positive result was achieved, it was tested by

amplifying a 93 bp fragment from the SRY gene from the same individual (SRY6 5'CGGCTTCCGTAAGCATT3' and SRY4 5'ACAGGCGCAAGGTCGCTCTA3'). Only in a male sample should there be a product after PCR.

DNA was extracted as described by Lidén et al. (1997). Detergents and coathrops removed proteins and lipids and DNA was extracted with a phosphate buffer and purified by silica binding. The DNA was amplified with Amplitaq Gold™ (Perkin Elmer). The 25 µl reactions contained 50 mM KCl, 10 mM Tri-HCl pH 8.3, 2.25 mM MgCl<sub>2</sub>, 0.2 mM of each dNTP, 0.5 µM of each primer, 1 U Taq-polymerase (Amplitaq Gold™, Perkin Elmer), 5 µl template DNA and 2% BSA. Hot start was performed automatically due to the enzyme used. The amplification cycles were initiated by a 2 min. denaturation step at 93°C, followed by 15 sec. at 94°C, 30 sec. at 49°C and 15 sec. at 72°C. This cycle was repeated 55 times. Finally, an extension step at 72°C for 7 min. followed.

The result was detected on a 2% ethidium bromide stained agarose gel and sequenced for confirmation (ABI BIG Dye terminator kit™).

Contamination was avoided by separating pre and post PCR-areas, UV-irradiation of surfaces and tools, by HCl washing tools, by applying uracil *N*-glycosylase methods and by reproducing every extraction and amplification in the same laboratory (Götherström & Lidén 1998).

## Results and discussion

Out of the seven samples from Eketorp, five produced reliable results, and out of the 21 samples from Vendel, 10 produced reliable results (table 1). Four of the five individuals from Eketorp proved to be male and one female, and six of the ten individuals from Vendel proved to be male and four female (table 1).

First of all, it is obvious that there is no dominance in either of the sexes as a whole, and male and female horses are present at both sites. Since the context is so limited in Eketorp, it is difficult to hypothesise much about what the horses represented. The only secure conclusion is that both male and female horses could be used for sacrificial purposes. In Vendel, where the setting is richer, it is somewhat easier. At least the horses represented some kind of wealth, considering the high quality of the rest of the grave property. They may also have represented a function. It has, for example, been suggested that the horses were part of a full cavalry equipment (Engström 1994). The different sexes may of course have been used for different tasks. It has been suggested that stallions were used in battle and mares for transportation and hunting (Sundkvist 2001:203). Either way there is nothing in the argument that indicates that one sex were of lesser value to the buried, and there is no reason to believe that the horses in the graves are inferior. In this view, it is interesting that both sexes are equally represented. Thus, as long as the horse was considered to be good quality, a mare would have been as worthy as a stallion/gelding to the Vendel or Viking age nobleman who owned it. Even if there is a clear male dominance in the material from Eketorp, a mare is still present. Stallions/geldings may have been the first choice for one who provided the rituals on southern Öland during the

Early Medieval time, but mares were well-accepted alternatives.

Sacrificial rituals involving horses have been discussed by among others, Klindt-Jensen (1957), Hagberg (1967) and Backe et al. (1993). Although Backe et al. mention stallions as the preferred sacrificial object, the sex of the horse is not a major issue in any of the mentioned publications. Hagberg's discussion may be of interest since it concerns horse sacrifices on Öland. He draws attention to the round-ups of animals and the importance such activities may have had at Skedemosse on Öland. He also draws parallels to ritual horse races. Backe et al.'s discussion is of greater interest in this case since they base their discussion on the same material as in this study i.e. the material from the waterhole outside the fortified village Eketorp. Backe et al. highlight the differences between the material from Skedemosse and that from the waterhole, where the frequency of diverse animals, and diverse horse parts, are at variance with Skedemosse and the waterhole in Eketorp. This has led to the interpretation that the material from the waterhole mainly consists of offal, where as at Skedemosse material consists of the remnants of ritual sacrifices (Backe et al. 1993). If this is the case, stallions/geldings were the first choice for the pagan communion at Eketorp on Öland 650-1100 AD.

Although there is no overall difference in the sex ratio of horses in the boat burials cemetery in Vendel, it is interesting to note some peculiarities about some of the graves. In grave VII, dating from the early or mid Vendel period, there were two of each mares and stallions of five possible horses. In grave III on the other hand, dating to the late Vendel period or the beginning of the Viking period, there are three stallions out of a possible three. However, more horse remains from other graves and other settings need to be examined from both periods before a final conclusion can be drawn regarding differences in the evaluation of stallions versus mares in society as a whole.

## Conclusion

I have shown that molecular sex identification is a tool that can enhance the knowledge of how mares vs. stallions could have been valued in prehistory. I found no indications of the preferences for one horse sex in the upper strata burials in Central Svealand, Vendel. In the ritual sacrifices on southern Öland however, there was a tendency towards stallions/geldings. A trend towards a variation in the Vendel Age burial and the Viking Age burial in Vendel could also be noted. Although not statistically significant this could mirror the general change in society and beliefs at this time. Whatever it was that made one horse more valuable than another during early Medieval time in upper class central Svealand (or in the rituals on southern Öland), it is highly unlikely that it was the horse's sex. Factors such as breed, capability and plain aesthetic values may have provided stronger arguments for the value of a horse.

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