

Andres Tvauri, Ester Oras and Ragnar Saage

**SPEARHEADS FROM KOHTLA-VANAKÜLA FIND:
REFINING EARLY IRON AGE (500 BC – AD 550)
SPEARHEAD TYPO-CHRONOLOGY
IN THE EASTERN BALTIC**

During the investigations of Kohtla-Vanaküla, 140 spearheads or fragments of spearhead blades were collected. All spearheads from Kohtla are socketed and have a pointed-oval-shaped blade, only four examples are rhomboid. Based on radiocarbon dates the Kohtla spearheads most likely date from the Roman Iron Age. Kunda and Alulinna wealth deposits from north-eastern Estonia contain spearhead assemblages most similar to the ones from Kohtla. The earliest finds of the main spearhead types found in Kohtla are known from Finnish Early Roman Iron Age contexts where this type prevails exclusively. The Finnish finds thus also correlate rather well with the dates obtained from Kohtla. The fact that Kohtla spearheads bear the greatest resemblance namely with finds from Virumaa province and coastal area of Finland indicates that they might come from these regions. However, the Kohtla spearheads are one of the earliest examples of such spearhead types in Estonia allowing to better refine the chronological distribution of this weapon type in the eastern Baltic. Additionally, we present the first metallographic analysis of a spearhead from this time period. The analysis shows that the spearhead was made out of homogeneous steel of good quality, whilst steel was used throughout the weapon and not only on the cutting edge. In comparison with the analysis of socketed axe from the same site, this might be seen as a testament to the higher status of weapons compared to tools.

Andres Tvauri, Institute of History and Archaeology at the University of Tartu, 18 Ülikooli St., 50090 Tartu, Estonia; andres.tvauri@ut.ee

Ester Oras, Institute of History and Archaeology at the University of Tartu, 18 Ülikooli St., 50090 Tartu, Estonia; ester.oras@ut.ee

Ragnar Saage, Institute of History and Archaeology at the University of Tartu, 18 Ülikooli St., 50090 Tartu, Estonia; ragnar.saage@ut.ee

Introduction

Kohtla-Vanaküla (from here onwards Kohtla) is an Iron Age weapons and tools deposit concealed in watery context, in north-eastern Estonia. It was discovered by a metal detectorist in 2013 and thoroughly studied by archaeologists in 2013 and 2014. The deposit contains a collection of artefacts and their fragments

from at least 400 initial objects. AMS dates from the different layers of the deposit, wood remains from the sockets of the weapons and artefact typochronology show that the deposit formed over a long period of time from around the turn of the millennia up to the pre-Viking Age (AD 550–800). However, most of the artefacts belong to the Roman Iron Age (AD 50–450) (Oras et al. 2018).

Spear was the most widespread weapon in Iron Age Estonia as well as throughout the entire northern and north-eastern Europe. Nevertheless, no general overview of Estonian Early Iron Age (500 BC – AD 550) spearheads has been attempted. This is due to the fact that the spearheads from this period lack distinctive features, they are often poorly preserved and the majority of them come from find complexes that are difficult to date. In addition, the total number of Early Iron Age spearheads found in the territory of Estonia was rather small until the discovery of the Kohtla hoard.

This paper presents the spearheads from the Kohtla find. We observe the main types of discovered spearheads, their dating and compare them with similar contemporaneous finds from the neighbouring countries and from north-eastern Europe in general. Radiocarbon dates from the remains of wooden shafts preserved in the sockets of spearheads enable refining the typology and chronology of Early Iron Age spearheads in the eastern Baltic.

History of research and types of spearheads

The most thorough overview of Estonian spearheads from the first half and middle of the 1st millennium was presented by Toomas Tamla and Mati Mandel in their paper about Rikassaare find (Mandel & Tamla 1977). They divided Rikassaare spearheads into two main types: spearheads with rhomboid blade, and spearheads with narrow pointed-oval-shaped blade. In addition, they identified one spearhead with round extensions in the basal part of the blade and two which they believed to be barbed spearheads. According to their study the artefacts from Rikassaare find dated to the 6th century and the first half of the 7th century (Mandel & Tamla 1977, 159 ff.).

Harri Moora studied Latvian Early Iron Age spearheads in detail in his doctoral theses (1929, tables XXVII–XXVIII; 1938, 508 ff.) where he also introduced the typology of the spearheads. Moora divided Latvian spearheads into seven types. Type A he described as a non-profiled spearhead (German *unprofilierten Lanzenspitzen*). The slightly curved slender blade with smooth transition from the socket to the blade is characteristic of this type. Type B blades have distinctive midrib with a convex or triangular cross-section proceeding along the blade – a slightly raised segment along the middle part of the blade. For type C the unique feature was the shape of the blade which is widest towards the socket. D-type blades have wide willow-leaf blade. E-type comprises of spearheads with rhomboid blades. Type F blades have extensions at the basal part. According to Moora, type D spearheads have short blade and long socket (at least half of the total length of the spearhead). The disadvantage of Moora's typology lies in

the fact that there is no single criterion to divide spearheads into types, instead different features (shape of the blade, existence of the midrib, length of the socket) have been taken into account for distinguishing different types. In addition, when trying to divide spearheads into types a large number of them is left in the grey zone between types A, C, or D.

Comprehensive overview of Lithuanian spearheads from the 2nd to the 8th centuries AD was published by Vytautas Kazakevičius (Kazakyavichyus 1988, 12–63). He divided them into two major groups: socketed spearheads and spearheads with a tang. He further divided socketed spearheads into nine types and seven subtypes. Tanged spearheads fall into two types. The division was based on the shape of the blade.

According to Kazakevičius, the types of socketed spearheads are as follows:

- I. Spearheads with a rhomboid blade. Those fall into five subtypes and two variances based on the proportions of the blade and the existence or lack of midrib.
- II. Spearheads with round extensions at the basal part of the blade which correspond to Moora's type F.
- III. Spearheads with sword-shaped blade.
- IV. Spearheads with bay-leaf (wide lanceolate) blade. There are two subtypes, one being widest near the middle of the blade and the other near the socket end of the blade.
- V. Spearheads with willow-leaf (narrow lanceolate) blade.
- VI. Spearheads with lanceolate blade. The shape of the blade falls between types IV and VII. Barbed spearheads.

Kazakevičius's types and subtypes broadly represent the same types that already Moora described. Most characteristic traits of his types are clear-cut and easy to recognize. Only the boundaries of the types IV, V, and VI are not explicit, and it would have been better to use only one type described as socketed spearheads with lanceolate blade.

Alfred Hackman presented the very first general outline of Finnish Late Iron Age spearheads in his doctoral theses (1905, 262 ff.). He divided the spearheads into main types according to the relative length of the socket compared to the blade. First group entails spearheads with a long blade, length of the blade being 2/3 of the total length of the spearhead. Those blades often have midrib. Spearheads of the second group have blades and sockets with an approximately equal length and the cross-section of a blade is rhombic and flat, sometimes they have a shallow midrib. Spearheads of the third group are characterized by long socket and neck, and a narrow but thick blade. The drawback of this typology is the ambivalence of the distinctive features which leaves large proportion of artefacts in the border zone of different types (see Pihlman 1990, 82). Furthermore, this typology can only be used when the spearheads have been completely preserved.

We should not overlook Helmer Salmo's doctoral thesis (published 1938) in order to understand the study history of spearhead typologies despite the fact that the theses concentrate on the Finnish Merovingian Era (600–800) spearheads and

finds from Roman Iron Age are not discussed. He divided the spearheads into three main types: Early Merovingian (7th century) throwing spears; thrusting spears; and Late Merovingian (8th century) throwing spears. Salmo formed intuitive subtypes for spearheads following the examples of German weaponry types (see Salmo 1938, 164–257). In Salmo's typology, the main characteristic trait is the shape of the blade and in addition to that several other features have been taken into account. The weak point of this typology is that some spearheads may meet the criteria for several different types simultaneously and at the same time, some Finnish Merovingian spearheads do not fit any type. Despite the unsystematic nature of Salmo's typology, it is still often cited today.

Unto Salo suggested the typology of Early Roman Iron Age (50–200) spearheads from Finnish territory in his doctoral thesis (1968, 130 ff.). The main characteristic traits are the measurements of the blade, the proportions between the width and length of the blade. Division into subtypes is based on the shape of the cross-section of the blade (sharp or shallow midrib, lack of midrib). Spearheads with blades having the length six to ten times larger than the width form the first group in Salo's typology (Salo 1968, 131 ff.). The second group contains spearheads with a 1:3–1:6 ratio of width to the length of the blade. In case of the third group, the ratio is 1:25–1:3 (Salo 1968, 141 f.). There is a serious problem with this typology: it does not consider the shape of the blade at all. It is often hard to measure the length of the blade in case of Early Iron Age spearheads because the transition from the socket to the blade is smooth with no clear boundaries. In addition, the use of Salo's typology is complicated because most of the spearheads from that period are only partially preserved and it is impossible to obtain all necessary measurements.

Among other artefacts, Ella Kivikoski presented spearheads from Finnish Roman Iron Age and Migration Period in her illustrated catalogue of Iron Age Finland (Kivikoski 1947a, 19, 27, 37; 1947b, 20 f., 28, 37 f.; 1973, figs 45–51, 148–156, 301–310). Kivikoski's division is a compilation of the typologies of previously mentioned authors (Hackman, Moora, Salmo) with a few additional types by Kivikoski herself (Pihlman 1990, 85). Kivikoski did not explain the principles for selecting the artefacts to be depicted in the illustrations of the catalogue.

Sirkku Pihlman analysed the variation of Finnish Migration Period and Merovingian spearhead and their typological development in her doctoral thesis in 1990. She grouped the spearheads according to their measurements, calculated ratios and their combinations (Pihlman 1990, 88 ff.).

To summarize, there are several different typologies for the Early Iron Age spearheads from Estonia and the neighbouring countries. The shortcomings of the existing typologies are as follows: they are often not based on one single feature or element as dividing criterion (Moora, Salmo); the features are not easy to perceive or measure (Hackman, Moora, Salmo); or the typology is so detailed and complicated that some types contain only one artefact (Pihlman). The types of existing typologies do not form functional, territorial, or chronological clusters.

It reveals that the features used to classify spearheads are randomly picked. When it comes to the typologies of Early Iron Age spearheads from the eastern coast of the Baltic Sea, Harri Moora's and Vitautas Kazakevičius's divisions portray the spearheads the best and are easiest to use. Furthermore, there are no elaborate discussions explaining the find contexts of the eastern Baltic Early Iron Age spearheads, their use (how the spears were used and for what purpose, i.e. for war or hunting), and their social significance.

The typologies of spearheads are most often based on the shape of the blade. There are three major groups of spearheads according to the typological grouping of Estonian Early Iron Age spearheads based on the shape of the blade as presented above: spearheads with a pointed-oval-shaped blades, spearheads with narrow lozenge-shaped blades and spearheads that have triangular extensions in the basal part of the blade (see also below).

The second distinctive feature is the connection with the shaft, which can be either socket or tang. All spearheads from Estonian Early Iron Age find contexts are socketed. A relatively long socket is characteristic of Roman Iron Age and Migration Period spearheads, in the case of which sockets make up 1/3 to half of the entire length of the spearheads. This is distinctive compared to later spearheads which have shorter sockets in relation to the length of the blade.

Spearheads from Kohtla find

During the investigations of Kohtla, 140 spearheads or fragments of spearhead blades were collected. In addition, 38 spearhead sockets or socket fragments were obtained. It is impossible to determine the exact number of spearheads that reached the archaeological collection, because of the somewhat fragmentary nature of the artefacts. It is possible, for example, that some of the sockets and blades come from one and the same artefact, whilst some unidentifiable iron objects gathered from the site may also be fragments of spearheads.

All spearheads from Kohtla are heavily corroded. Even the spearheads which have remained their original shape have only a small amount of iron left in the middle of the blade and socket, remainder being converted to rust (pers. comm. Kristiina Paavel; Fig. 1).

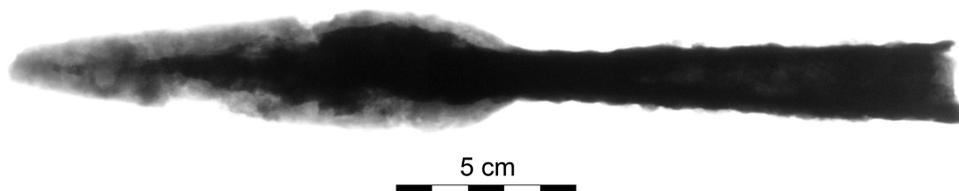


Fig. 1. An x-ray of a spearhead with lanceolate blade (TÜ 2309: 20). Photo by Kristiina Paavel.

Remains of wooden shafts discovered in 53 spearhead sockets indicate that most of the spearheads had shafts (or parts of it) at the time of deposition. All the remains were identified as of deciduous tree origin. The identification at the species level was available for four examples: three were clearly birch (*Betula*), the fourth potentially acer (*Acer platanoides*)¹. All the spearheads were studied with X-ray but as they were really poorly preserved it was only possible to detect nail remains on one socket (TÜ 2309: 74) (pers. comm. K. Paavel) and probable nail holes in a few cases.

Poor preservation makes analysing the measurements and weight of the spearheads complicated. Only 22 spearheads have survived well enough to determine their original length despite the fact that the tip of blade has been broken. The length of those is between 15–31 cm. The length of the blade for 22 measured items is 6–20 cm. The width of those blades that are in slightly better condition is between 2.2–4.2 cm and the widest spearhead of the assemblage is also the longest. The length of the socket was measurable for 28 items remaining between 5 and 12.5 cm. Width of the more intact sockets is between 1.5–2.5 cm (pers. comm. K. Paavel).

All the Kohtla spearheads have smooth transition between the blade and the socket. In terms of shape and technology, all Kohtla spearheads are very similar. Proposing any kind of division is difficult as the only shared trait for those spearheads is the lack of distinctive features. Since the shape of the blade has so far been the most often used feature to divide the spearheads into types, we consider blade morphology for describing the spearheads from Kohtla, whilst only 66 of the spearheads belong to a distinct type.

Most numerous in Kohtla find are spearheads with **pointed-oval-shaped (lanceolate)** blades. At least 61 spearheads represent this type, 57 blades are also widest at the basal part, near the socket (Fig. 2: 1–3), only four have a more lineal shape (Fig. 2: 4). There are four **narrow lozenge-shaped (rhomboid)** spearheads in Kohtla find (Fig. 3). Spearheads that have **triangular extensions in the basal part of the blade** make up the third type. There is only one such spearhead in Kohtla find (Fig. 4). Unfortunately, the boundaries of all three types are vague. The appearance of any artefact is a result of not only the intention but also the skills of a craftsman, the use (sharpening), or corrosion. For example, at least the spearhead with triangular extensions in the basal part of the blade have acquired such appearance due to repetitive sharpening.

Some Kohtla spearheads have a **midrib**. This should be viewed as a distinctive feature in itself because both lanceolate and rhomboid spearheads can have it. There are only three spearheads from Kohtla with unquestionable existence of midrib (Figs 3: 1; 5: 3), but as the spearheads are so heavily corroded one cannot rule out the possibility that there were more such spearheads originally.

¹ Identified by Regino Kask, Estonian University of Life Sciences.



Fig. 2. Spearheads with a lanceolate blade (TÜ 2309: 22, 56, 65, 89). Photo by Kristiina Paavel.



Fig. 3. Spearheads with rhomboid blade (TÜ 2309: 37, 97, 111). Photo by Kristiina Paavel.



Fig. 4. Spearhead with triangular extensions in the basal part of the blade (TÜ 2309: 84). Photo by Kristiina Paavel.



Fig. 5. AMS dated spearheads (TÜ 2309: 53, 63, 72). Photo by Kristiina Paavel.

Radiocarbon dates

Sockets of four spearheads (TÜ 2309: 53, 63, 65, and 72; Fig. 5) yielded remains of wood which was radiocarbon dated (Table 1; Fig. 6). The dating was carried out at the ¹⁴CHRONO Centre, Queen's University Belfast. All samples were of deciduous tree origin, with sample from spearhead TÜ 2309: 65 identified as potentially acer (maple). The dates indicate that spearheads of pointed-oval-

Table 1. AMS dates of wood remains from the sockets of spearheads from Kohtla. Results calibrated with OxCal v4.3.2 (Bronk Ramsey 2009) and the IntCal13 atmospheric calibration curve (Reimer et al. 2013)

Artefact number	Laboratory number	Radiocarbon age	Calibrated age 95.4 (2 sigma)
TÜ 2309: 63	UBA-27684	2107 ± 170	739 BC – 318 AD
TÜ 2309: 72	UBA-27689	1883 ± 28	65 – 218 AD
TÜ 2309: 53	UBA-29330	1954 ± 65	111 BC – 225 AD
TÜ 2309: 65	UBA-29331	2079 ± 52	347 BC – 49 AD

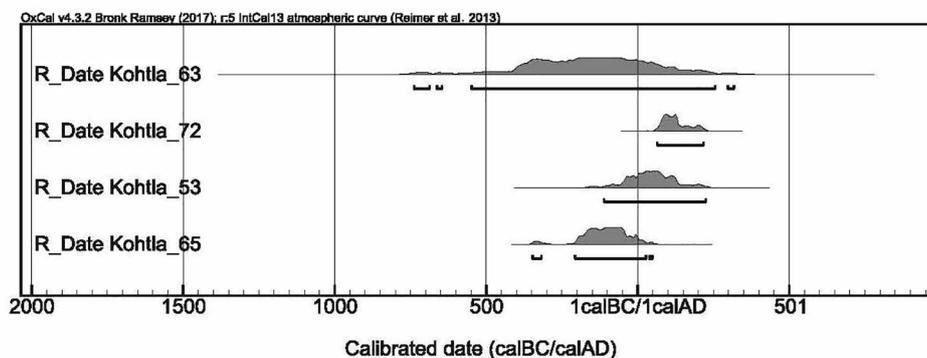


Fig. 6. AMS dates of wood remains from the sockets of spearheads from Kohtla. Results calibrated with OxCal v4.3.2 (Bronk Ramsey 2009) and the IntCal13 atmospheric calibration curve (Reimer et al. 2013). Range bars are shown at 95.4% probability.

shaped blade type (TÜ 2309: 52, 53 and 63) might go back to the Pre-Roman Iron Age, although their calibration curve also places them to the first decades of the Roman Iron Age. Nevertheless, we are certainly dealing with rather early finds predating the Migration Period. Another chronological refinement relates to the date from spearhead with a raised midrib with a convex or triangular cross-section (TÜ 2309: 72). This object clearly dates to the first half of the Roman Iron Age correlating well with Salo's spearhead chronology (see above).

Metallographic analysis

Spearheads from this time period have not been studied metallographically in Estonia, which sparked interest for the invasive analysis. The spearhead TÜ 2309: 72 was corroded and fragmented, but as the X-ray images looked promising, we went forward with the metallographic analysis. The spearhead was cut with a precision saw, mounted in resin, ground with diamond suspensions and polished with Al_2O_3 paste. The polished sample was etched in a 4% nital solution. Micro hardness was measured with a Wilson Tukon 1102 tester on the Vicker's scale with 0.05 kg during 10 seconds (from here on referred as HV0.05).

Metallic iron was only preserved in the core of the spearhead (Fig. 7: b). The carbon content in the spearhead core was close to the 0.8% eutectoid composition (Fig. 7: c). The hardness values of 10 repeated measurements were between 207–261 HV0.05. The pearlitic structure implies that the spearhead has either lost its heat treatment in a pyre or has not been heat treated.

Metallographically investigated Lithuanian spearheads from a 3rd to 5th century burial ground in Marvelė are temporally and spatially closest examples to the Kohtla spearhead. Three spearheads were made out of heterogeneous iron, with a low carbon content ranging between 0.05–0.8% and they were most probably carburized along the edge (Bertašius et al. 2010). The fourth spearhead resembled

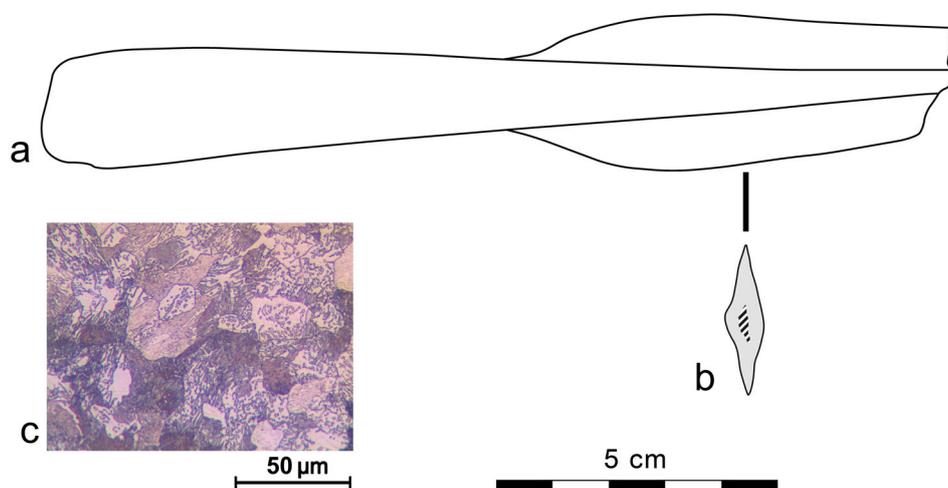


Fig. 7. Spearhead TÛ 2309: 72. a – drawing based on X-ray photos, b – cross section, corroded area is marked with grey, c – micrograph of the blade core.

the Kohtla spearhead, having a relatively homogeneous carbon content that in many places reaches around 0.4–0.6%. The chemical analysis showed, that the first three spearheads were locally produced, while the fourth one was imported (Bertašius et al. 2010).

It is also possible to make some assumptions on the forging pattern of the spearhead based on the metallographic analysis of similarly shaped spearheads from Russia. Three different forging patterns have been used for the manufacture of spearheads from Starshiy Akhmylovskiy cemetery by the Volga River dated to 8th to 6th centuries BC (Zav'yalov et al. 2009, 17, fig. 9). The simplest known forging pattern can be excluded for the Kohtla spearhead, which is a monolithic iron spearhead, that was carburized along the edge. There are two forging patterns from Starshiy Akhmylovskiy that may be applicable for the cross section observed in the current study: a monolithic steel spearhead; and a layered pattern, where the spearhead's blade has been welded between the ridges extending from the socket. If the latter is true for the Kohtla spearhead, then the ridge is actually a technological feature that aids in the forge welding of the blade to the socket and its extending ridges. If the spearhead is made from one piece, then the ridge is a decorative feature.

In any case, the spearhead was made out of homogeneous steel of good quality, which shows that the smith manufacturing the spearhead has access to this material. In comparison with the socketed axe from the same site (Saage et al. 2018), steel was used throughout the weapon and not only on the cutting edge. This might be seen as a testament to the higher status of weapons compared to tools. Further analysis of spearheads is necessary to determine if the Kohtla spearhead is also an outlier like the fourth Marvelè spearhead.

Early Iron Age spearheads from elsewhere in Estonia

Spearheads similar to the ones found from Kohtla have been discovered as stray finds, and are thus impossible to date. Pre-Roman Iron Age and Roman Iron Age spearheads and weapons in burial contexts are extremely rare. Only two spearhead fragments are discovered in Pre-Roman Iron Age grave. Roman Iron Age graves have yielded altogether seven spearheads but there is no certainty that the spearheads date from the Roman Iron Age – they might have reached the graves only during the Migration Period. This number seems low, especially when compared to Finland, where Unto Salo has identified approximately 70 spearheads in the Early Roman Iron Age graves alone (Salo 1968, 130). The find assemblages in Estonian Early Iron Age stone cist graves unfortunately do not provide means to date spearheads because the artefacts of several different burials lay intermingled in the grave and the graves have been used for many centuries.

Based on the site of the find, the earliest date belongs to a spearhead socket from **Kurevere tarand grave** in Saaremaa and spearhead with a lanceolate blade from Poanse *tarand* grave in Läänemaa constructed in the Pre-Roman Iron Age (Lõugas 1977, plate II: 2; Mandel 1978, plate VI: 1). *Tarand* graves from the surroundings of Tallinn have yielded several spearheads. Among them, **Proosa single-tarand grave**, dated to 300–450, yielded a spearhead with extensions at the basal part (Lang 1996, 183 f., fig. 65: 1), quite similar to the only specimen of the type from Kohtla (Fig. 4). Unfortunately, one cannot rule out the possibility that the spearhead belonged to the Migration Period stone grave-field just next to *tarand* grave (Lang 1996, 182). It is impossible to determine the type of spearhead from **Mõigu-Peetri tarand grave** near Tallinn (Tamla 1977, fig. 3) due to its poor condition. Probably one is dealing with a lanceolate blade or a blade with extensions at the basal part. Find assemblage of *Mõigu-Peetri tarand* grave mostly dates from the 3rd to 5th centuries, but the burials continued in the Migration Period and even later (Tamla 1977, 59 f.). A spearhead with a lanceolate blade and long socket from **Viimsi I tarand grave** (Lang 1993, fig. 15: 1) resembles one spearhead from Kohtla find (Fig. 5: 3). According to other finds from Viimsi I *tarand* grave this burial site was constructed in the second half of the 4th century and the burials continued at least until the end of the 5th century AD (Lang 1993, 54). **Kõvermäe tarand grave** at Ilumäe, in Virumaa province yielded two spearheads (Lang 2000, fig. 75) both very similar to the majority of Kohtla spearheads. *Kõvermäe* spearheads have slender lanceolate blade which is widest at the basal part near the socket. Remainder of the find assemblage dates the burials in *Kõvermäe* grave to the 4th and 5th centuries AD (Lang 2000, 169). Seven spearheads have reached archaeological collections from **Taadikvere Kõõre stone grave** in the northern part of historic Viljandimaa province. According to finds, the burial site was first used in the 3rd to 5th centuries and then again in the 10th to 12th centuries AD. Majority of spearheads date to the later period, only one spearhead with a rhomboid blade and long socket (Hausmann 1902, table 12) dates from the Roman Iron Age or the Migration

Period. A spearhead from **Virunuka IV tarand grave** in south-eastern part of Estonia may date from the Roman Iron Age. Other finds from that grave date to the period from the 2nd to 6th centuries (Laul 1965, 342, 347). This spearhead (Laul 1965, fig. 13) has a long and linear blade and bears no resemblance to any spearheads from Kohtla.

Migration Period graves have yielded at least seven spearheads. Four were obtained from **Proosa stone grave-field** (Deemant 1993; Lang 1996, 196 f.). First of them (Lang 1996, plate LI: 1) has a wide angular blade and barely noticeable extensions at the basal part. It is possible that the blade has gained such a shape due to corrosion. The second spearhead (Lang 1996, plate LI: 2) has a narrower blade and typologically definitely represents the spearhead with extension. The third spearhead from Proosa stone grave-field (Deemant 1993, plate XX: 4) has narrow lanceolate blade, widest at the bottom near the socket. Fourth (Deemant 1993, plate XX: 1) is so heavily corroded that it is impossible to determine the original shape of the blade. The spearhead has a long blade (2/3 of total length) with a midrib. **Paju grave** in Saaremaa revealed simple spearhead with lanceolate blade (Tamla & Jaanits 1977, plate X: 3). A Migration Period inhumation burial in **Kuninguste grave** contained a spearhead with a lanceolate blade (Lõugas 1974, 82, plate I: 12). A spearhead with narrow lanceolate blade was found from **Kurna II stone grave**, south from Tallinn (Friedenthal 1911, plate IV: 69). The date of that spearhead remains unclear because the grave contains finds from both 1st to 2nd centuries AD and from the second half of the first millennium AD (Lang 1987, 192 f.).

Up to now, other wealth deposits or hoards but Kohtla dating from the middle of the first millennium AD have yielded altogether 140 spearheads. Largest are **Alulinna finds** which contained among other artefacts 60 spearheads from the given period (Oras 2010, No. 1). Majority of spearheads from Alulinna wealth deposit represent the pointed oval-shaped blade (see Tamla 1995, table 2). **Rikassaare wealth deposit** contained 54 spearheads (Mandel & Tamla 1977). Most of them have angular blades, only a few have pointed oval-shaped blade (Mandel & Tamla 1977, 159). **Kunda I wealth deposit** contained 5 spearheads (Oras 2010, No. 2) with pointed oval-shaped blade (see Tamla 1995, fig. 5: 10). Twenty-one spearheads dating from the 5th to 6th centuries come from an unspecified find spot somewhere in northern Estonia (Oras 2009, No. 24).

Counterparts of Kohtla spearheads in neighbouring countries and their dating

Spearheads with pointed-oval-shaped blade are widespread both in Estonia and neighbouring countries. This spearhead type with a relatively simple shape developed further and stayed in use until the beginning of the Viking Age. Spearheads from Paluküla wealth deposit from north-western Estonia (see Oras 2015, 328) and a spearhead discovered near stone grave in Roobaka village, Saaremaa (SM 8723/A 684) serve as an example.

In Latvia, such spearheads discovered in both wealth deposits and graves have been dated to the 5th and 6th centuries (for example Graudonis 1964, fig. 8; Oras 2015, 319). In Lithuania pointed-oval-shaped blades with widest middle part have been dated to the 2nd to 4th centuries (Kazakyavichyus 1988, 42 ff.). Pointed-oval-shaped spearheads widest at the basal part, near the socket, have been dated to 4th to 8th centuries instead (Kazakyavichyus 1988, 45 ff.). In southern Finland pointed-oval-shaped spearheads may come from various find contexts from different periods: Early Roman Iron Age (Kivikoski 1973, figs 45–47), Late Roman Iron Age (Kivikoski 1973, fig. 152), and Migration Period (Kivikoski 1973, figs 306, 307). In Early Roman Iron Age find contexts such spearheads prevail exclusively and namely Finnish spearheads from that period are the most similar to the spearheads from Kohtla (see Salo 1968). Spearheads with different pointed-oval-shaped blades were widespread in Roman Iron Age Scandinavia (Ilkjær 1990, 60 f., 128 ff., fig. 197). This type was predominant already among the spearheads from Pre-Roman Iron Age burials on Gotland (Nylén 1956, 519 f.). It follows that spearheads with pointed-oval-shaped blades were in use since the Pre-Roman Iron Age until the Pre-Viking Age.

Spearheads with narrow lozenge-shaped blade have also been widespread. In Latvia, 6th century wealth deposits from Mūkukalns III and Rūsiši contained them (Oras 2015, 335 f.). In Lithuania, spearheads with rhomb-shaped blade form a part of find assemblage in burials from the 3rd to 4th centuries AD (Kazakyavichyus 1988, 22). In Finland, Migration Period graves have yielded rhombic spearheads (Kivikoski 1973, figs 308, 309). Spearheads with narrow lozenge-shaped blade were in use mainly during the Migration Period and Pre-Viking Age.

Spearheads with extensions in the basal part of the blade are geographically widespread but much less numerous than spearheads with pointed-oval-shaped blades or with rhomboid blades. In Latvia, they occur in both wealth deposits and graves and they have been dated to the 5th to 6th centuries AD (see e.g. Graudonis 1964, fig. 8; Oras 2015, 319, 349). In Lithuania, spearhead with extensions in the basal part came into use in the 5th century and remained in use until the end of the 7th century AD (Kazakyavichyus 1988, 39). In Finland, earliest such spearheads are found in Late Roman Iron Age graves (Kivikoski 1973, fig. 151) but the majority come from Merovingian period (600–800 AD) graves and this type of spearhead is named after the find spot of one characteristic specimen and they are known as Yliskylä-type spearheads (Salmo 1938, 164 ff.; Kivikoski 1973, fig. 534).

As mentioned above, spearheads with a midrib do not form a separate type, this feature can accompany blades of different shapes. Well defined midrib was common on Gotland (see Nylén 1956, figs 185: 5, 6; 190: 13), Finland (see Kivikoski 1973, figs 46, 149, 150, 309, 545, 546), and Latvia from the Pre-Roman Iron Age until the 7th century AD, but its distribution area reaches the Oka River basin in the east (Mandel & Tamla 1977, 160; Kazanski 2007, 241). The midrib is not a suitable feature when it comes to dating of the artefacts

because it occurs over a long period of time in case of spearheads with different shapes of the blade.

Consequently, the main spearhead types from Kohtla wealth deposit were common in all countries of the eastern Baltic. Spearheads with rhomboid blades and with pointed-oval-shaped blades were in use for a long period of time, from the beginning of the Iron Age until at least the beginning of the Pre-Viking period. Spearheads with extensions in the basal part of the blade have been dated to the period from 5th to 7th centuries AD.

Spearhead assemblages similar to Kohtla find

It is equally important to consider what is absent in Kohtla find. There are no barbed or tanged spearheads. Barbed spearheads emerged in eastern Baltic only in the Migration period and increasingly spread in the Pre-Viking period (see Atgāzis 1974), whilst in the southern Scandinavia they are found already in the Roman Iron Age (see Ilkjær 1990; Kontny 2017, fig. 1). This might indicate that the Kohtla find is of earlier date than characteristic to these spearhead types or that the weaponry of Estonian tribes followed the lines of Baltic not Germanic traditions.

Alulinna and Kunda finds bear closest resemblance to Kohtla find in terms of both the types of spearheads as well as overall find assemblage. The spearheads from Rikassaare wealth deposit are different, most of them have rhomboid blade there are also a few barbed spearheads in Rikassaare find. One can expect such a difference as Rikassaare wealth deposit is clearly younger than Kohtla find, it was left in the ground in 6th–7th centuries AD.

Largest wealth deposit known from neighbouring countries is Kokumuiža I from Courland province, Latvia. Over 1200 artefacts mostly made of iron were discovered from wetland, among them were at least 568 spearheads. Find assemblage has been dated to the end of the 5th century (Urtāns 1964, 55 ff.). Majority of spearheads from Kokumuiža have relatively wide rhomboid blades (see Urtāns 1964, fig. 26; 1977, figs 46: 1–20; 47: 4, 5, 6; 49: 27–34). If one is to find parallels in Latvia, Vecmokas find from Tukums, Courland province contains 24 spearheads quite similar to Kohtla spearheads (see Urtāns 1964, fig. 33; 1977, 150 ff., fig. 57).

Discussion

All spearheads from Kohtla are socketed and have a pointed-oval-shaped blade, only four examples are narrow lozenge-shaped. Based on radiocarbon dates Kohtla spearheads most likely date from the Roman Iron Age; in some cases a slightly earlier dating is possible. The Estonian Migration Period find contexts have yielded spearheads with predominantly narrow lozenge-shaped blades; therefore it is plausible that pointed-oval-shaped blade is more characteristic of Roman Iron Age spearheads and the rhombic shape rather indicates the Migration Period.

The earliest finds of the main spearhead types very similar to those found in Kohtla (pointed-oval-shaped blade) are known from the Finnish Early Roman Iron Age contexts where this type prevails exclusively. The Finnish finds thus also correlate rather well with the dates obtained from Kohtla. The fact that Kohtla spearheads bear the greatest resemblance namely with finds from Virumaa province and coastal area of Finland indicates that the spearheads might come from these regions. One also has to keep in mind, that there are no direct dates from Latvian material and their current estimation to the 5th–6th centuries is based on artefact typo-chronology solely.

Kohtla deposit is the first of the kind at least in Estonia providing direct radiocarbon dates from the sockets of the spearheads. These analyses have situated the types of spearheads found in Kohtla to earlier periods than previously expected. In principle, it is possible that we might be facing the reuse of wood in the case of wooden handles and thus the old wood effect cannot be entirely ruled out in the case of our AMS dates. However, it is very unlikely that major trunks of wood were used for producing spear handles and most likely contemporary trees and their slim branches were used for this purpose. Therefore, we most likely deal with rather accurate dates, which is also confirmed by the fact that the dates from spearheads fall within the same timespan.

Unfortunately, no data enables to determine the time between producing the spearhead and the shaft and their deposition. The homogeneity of the spearhead assemblage suggests that the artefacts have been produced and deposited in the ground in rather a short period of time. This is also supported by the fact that the majority of AMS dates from Kohtla (including material from the sockets of axes as well) fall within the same timespan, i.e. around the turn of the millennia, especially the first centuries of the Roman Iron Age (see Oras et al. 2018).

Conclusions

During the investigations of Kohtla, 140 spearheads or fragments of spearhead blades were collected. In addition, 38 spearhead sockets or socket fragments were obtained. Based on radiocarbon dates Kohtla spearheads most likely date from the Roman Iron Age, in some cases a slightly earlier date is possible. All the spearheads from Kohtla wealth deposit are very similar. They represent spearhead types that were widespread during the 1st to 6th centuries in Estonia, its neighbouring countries and throughout transalpine Europe. The Kohtla spearheads are one of the earliest examples of such spearhead types in Estonia allowing to better refine the distribution of this weapon type in the eastern Baltic.

The metallographic analysis of a spearhead from Kohtla showed that it was made out of homogeneous steel of good quality, which was used throughout the weapon and not only on the cutting edge. This might be seen as a testament to the higher status of weapons compared to tools.

Kunda and Alulinna wealth deposits contain spearhead assemblages most similar to the ones from Kohtla. A few spearheads unearthed from *tarand* graves

and stone grave-fields of northern Estonia are also analogous. The earliest finds of the main spearhead types very similar to those found in Kohtla are known from Finnish Early Roman Iron Age contexts where this type prevails exclusively. The Finnish finds thus also correlate rather well with the dates obtained from Kohtla. The Kohtla spearheads bear the greatest resemblance with finds from Virumaa and Finnish coastal area which might indicate the origin of these weapons.

Acknowledgements

The study was financed by the Estonian Ministry of Education and Research (IUT20-7), and the University of Tartu Faculty of Arts and Humanities base funding for the research of national significance. The publication costs of this article were covered by the Estonian Academy of Sciences, the Institute of History and Archaeology at the University of Tartu, and the Institute of History, Archaeology and Art History of Tallinn University.

References

- Atgāzis, M.** 1974. Dzelzs iedzītņa šķēpu gali ar atkarpēm Latvijā. – *Arheoloģija un etnogrāfija*, XI, 154–172.
- Bertašius, M., Navasaitis, J., Selskienė, A. & Žaldarys, G.** 2010. Marvelės kapinyno geležies dirbinių metalografiniai, mechaninių savybių ir elementinės sudėties tyrimai. – *Lietuvos Archeologija*, 36, 153–182.
- Bronk Ramsey, C.** 2009. Bayesian analysis of radiocarbon dates. – *Radiocarbon*, 51, 337–360.
- Deemant, K.** 1993. Proosa kivikalmistu. Magistritöö. Tartu, Tallinn. Manuscript in the University of Tartu Library.
- Friedenthal, A.** 1911. Das Gräberfeld Cournal, Kirchspiel St. Jürgens, Harrien, Estland. Franz Kluge, Reval.
- Graudonis, J.** 1964. Mūkukalna depozīti. – *Arheoloģija un etnogrāfija*, VI, 75–84.
- Hackman, A.** 1905. Die ältere Eisenzeit in Finnland. Die Funde aus den fünf ersten Jahrhunderten n. Chr. Helsingfors.
- Hausmann, R.** 1902. Die Steinsetzungen zu Eigstfer, Kirchspiel Pillistfer, Livland. – *Sitzungsberichte der Gelehrten estnischen Gesellschaft*, 1901. Jurjew (Dorpat), 223–254.
- Ilkjær, J.** 1990. Illerup Ådal. Die Lanzen und Speere, 1. (*Jysk Arkæologisk Selskabs Skrifter*, XXV: 1.) Århus.
- Kazakyavichyus, V.** 1988. = **Казакявичюс В.** Оружие балтских племен II–VIII веков на территории Литвы. Моклас, Вильнюс.
- Kazanski, M.** 2007. The armament, horsemen's accoutrements, and riding gear of Long Barrow Culture (fifth to seventh centuries). – *Archaeologia Baltica*, 8, 238–253.
- Kivikoski, E.** 1947a. Suomen rautakauden kuvasto. Werner Söderström Osakeyhtiö, Porvoo, Helsinki.
- Kivikoski, E.** 1947b. Die Eisenzeit Finnlands. Bilderatlas und Text. Werner Söderström Osakeyhtiö, Porvoo, Helsinki.
- Kivikoski, E.** 1973. Die Eisenzeit Finnlands. Bildwerk und Text. Neuausgabe. Finnische Altertumsgesellschaft, Helsinki.
- Kontny, B.** 2017. Brothers-in-arms. Balt warriors and their interregional contacts in the Roman and Migration Periods (the case of the Bogaczewo and Sudovian cultures). – *Lietuvos Archeologija*, 43, 11–62.

- Lang, V.** 1987. Tallinna ümbruse tarandkalmed. – TATÜ, 2, 190–206.
- Lang, V.** 1993. Kaks tarandkalmet Viimsis, Jõelähtme kihelkonnas. (Töid arheoloogia alalt, 2.) Eesti Teaduste Akadeemia Ajaloo Instituut, Tallinn.
- Lang, V.** 1996. Muistne Rävala: muistised, kronoloogia ja maaviiljelusliku asustuse kujunemine Loode-Eestis, eriti Piritajõe alamjooksu piirkonnas, I–II. (MT, 4. Töid arheoloogia alalt, 4.) Eesti Teaduste Akadeemia Ajaloo Instituut, Tallinn.
- Lang, V.** 2000. Keskusest ääremaaks: viljelusmajandusliku asustuse kujunemine ja areng Vihasoo-Palmse piirkonnas Virumaal. (MT, 7.) Tallinn.
- Laul, S.** 1965. Virunuka tarandkalmed Võru rajoonis. – TATÜ, 14: 3, 317–360.
- Lõugas, V.** 1974. Die Bodendenkmäler in der Umgebung von Kuninguste und Tagavere auf der Insel Saaremaa. – TATÜ, 23: 1, 79–84.
- Lõugas, V.** 1977. Ausgrabungsergebnisse eines Steingräberfeldes von Kurevere. – TATÜ, 26: 1, 48–52.
- Mandel, M.** 1978. Über die Ausgrabungen der Tarandgräber von Poanse. – TATÜ, 27: 1, 78–81
- Mandel, M. & Tamla, T.** 1977. Rikassaare relvaid. – TATÜ, 26: 2, 158–164.
- Moora, H.** 1929. Die Eisenzeit in Lettland bis etwa 500 n. Chr. Tafeln zum I. Teil. (Õpetatud Eesti Seltsi Toimetused, XXV.) Tartu.
- Moora, H.** 1938. Die Eisenzeit in Lettland bis etwa 500 n. Chr. II Teil: Analyse. (Õpetatud Eesti Seltsi Toimetused, XXIX.) Tartu.
- Nylén, E.** 1956. Die jüngere vorrömische Eisenzeit Gotlands. Funde, Chronologie, Formenkunde. (Kungl. Vitterhets Historie och Antikvitets Akademien, 39.) Stockholm.
- Oras, E.** 2009. Eesti keskmise rauaaja peitvarad. Magistratöö. Lund, University of Tartu. Manuscript in the archive of the Institute of History and Archaeology at the University of Tartu.
- Oras, E.** 2010. Ritual wealth deposits in Estonian Middle Iron Age material. – EJA, 14: 2, 123–142.
- Oras, E.** 2015. Practices of Wealth Depositing in the 1st–9th Century AD Eastern Baltic. Sidestone Press.
- Oras, E., Kriiska, A., Kimber, A., Paavel, K. & Juus, T.** 2018. Kohtla-Vanaküla weapons and tools deposit: an Iron Age sacrificial site in north-east Estonia. – EJA, 22: 1, 5–31.
- Pihlman, S.** 1990. Kansainvaellus- ja varhaismerovinkiajan aseet Suomessa: typologia, kronologia ja aseet ryhmästrategioissa. (Iskos, 10.) Suomen Muinaismuistoyhdistys, Helsinki.
- Reimer, P. J., Bard, E., Bayliss, A., Beck, J. W., Blackwell, P. G., Bronk Ramsey, C., Buck, C. E., Cheng, H., Edwards, R. L., Friedrich, M., 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, 1869–1887.
- Saage, R., Kiilmann, K. & Tvauri, A.** 2018. Manufacture technology of socketed iron axes. – EJA, 22: 1, 51–65.
- Salmo, H.** 1938. Die Waffen der Merowingerzeit in Finnland. (SMYA, XLII: 1.) Helsinki.
- Salo, U.** 1968. Die frühromische Zeit in Finnland. (SMYA, 67.) Helsinki.
- Tamla, Ü.** 1977. Das Tarandgrab von Mõigu-Peetri. – TATÜ, 26: 1, 55–61.
- Tamla, T.** 1995. Einige estnische Moorfunde aus dem ersten Jahrtausend. – Archaeology East and West of the Baltic. Papers from the Second Estonian-Swedish Archaeological Symposium, Sigtuna, May 1991. Ed. I. Jansson. (Theses and Papers in Archaeology. N. S. A7.) Stockholm, 103–110.
- Tamla, T. & Jaanits, K.** 1977. Das Gräberfeld und der spätneolithische Siedlungsplatz von Paju. – TATÜ, 26: 1, 64–71.
- Urtāns, V.** 1964. Latvijas 5.–9. gs. depoži. – Arheoloģija un etnogrāfija, VI, 39–75.
- Urtāns, V.** 1977. Senākie depoži Latvijā (līdz 1200. g.). Latvijas PSR Vēstures muzejs, Zinātne, Rīga.
- Zav'yalov, V., Rozanova, L. & Terekhova, N.** 2009. = Завьялов В., Розанова Л. & Терехова Н. История кузнечного ремесла финно-угорских народов Поволжья и Предуралья: к проблеме этнокультурных взаимодействий. Российская Академия наук, Институт археологии, Знак, Москва.

Andres Tvauri, Ester Oras ja Ragnar Saage

**KOHTLA-VANAKÜLA LEIU ODAOTSAD: BALTIMAADE
ODAOTSTE TÜPOKRONOLOOGIA TÄPSUSTAMINE**

Resümee

Artiklis on antud ülevaade Kohtla-Vanaküla leiu odaotstest. Milliseid odaotsi leiti? Mis ajast need pärinevad? Kuidas need paigutuvad piirkondlikku ja laiemini Euroopa konteksti? Kuidas ja millest on need valmistatud?

Kohtlast koguti 140 odaotsa või odaotsa teramiku katket. Lisaks võeti üles 38 odaotsa putke või putke katket. Leitud odaotsad on väga tugevalt roostetanud. Kogu pikkuses ühes tükis säilinud odaotsi on 20. Enamikul algkuju säilitanud odaotstel on rauda alles vaid lehe keskel ja putkes, lehe tipp ja servad ning putke ots koosnevad vaid oksiidist (jn 1).

53 putkes on säilinud puitu, mis näitab, et kõik või suurem osa odaotstest olid leiu kohta jäädes varretatud. Varred olid valmistatud lehtpuude puidust, kolmel juhul kasest ja ühel juhul arvatavasti vahtrast. Tulenevalt esemete väga halvast säilivusest ja hoolimata sellest, et kõikidest tehti ka röntgenfotod, õnnestus vaid neljal putkel tuvastada nael ning paaril putkel tõenäoline naelaauk.

22 odaotsa on säilinud sedavõrd, et nende algset pikkust on võimalik mõõta või hinnata. Selliste esemete pikkus on 15–31 cm. Lehe pikkus on tervematel odaotstel 6–20 cm ja laius 2,2–4,2 cm, kusjuures kõige laiema lehega odaots on ühtlasi ka pikim. Tervemana säilinud putkede pikkus on 5–12,5 cm ja laius suudmest mõõdetuna 1,5–2,6 cm.

Seni publitseeritud Läänemere idakalda vanema rauaaja odaotste tüpoloogiatest on kõige paremini odaotsi iseloomustavad ja lihtsamini kasutatavad Harri Moora ning Vitautas Kazakevičiuse tüpoloogiad. Odaotste tüüpe sõnastatakse lehe ehk teramiku kuju põhjal. Teiseks tunnuseks on osa, millega odaots varre külge kinnitati: kas putk või roots. Eesti vanema rauaaja odaotsad on kõik putkega. Rooma rauaaja ja rahvasterännuaja odaotstele on iseloomulik suhteliselt pikk putk: 1/3 kuni pool odaotsa kogupikkusest. See eristab neid hilisematest odaotstest, millel on teramikuga võrreldes lühem putk. Kõikide Kohtla odaotste üleminek lehelt putkele on sujuv. Kujult ja teostuselt on Kohtla odaotsad omavahel väga sarnased. Kuna teramiku kuju on odaotste liigitamisel enim kasutatud tunnus, kirjeldatakse Kohtla odaotsi teramiku kuju aluseks võttes. Kohtlast kogutud odaotstest paigutuvad vaid 66 mingisse tüüpi.

Kõige arvukamad on Kohtla odaotste seas teravovaalse teramikuga odaotsad. Sellesse tüüpi kuulub vähemalt 61 odaotsa, neist 57 lehe suurim laius on putkepoolses osas (jn 2: 1–3), vaid nelja leht on sümmeetriliselt teravovaalne (jn 2: 4). Rombikujulise lehega odaotsi on neli (jn 3). Kolmandaks tüübiks on odaotsad, mille lehe tagaosas on kolmnurkselt väljaulatuvad lehenurgad. Kohtla leius on üks selline odaots (jn 4). Kolmel odaotsal (jn 3: 1; 5: 3) on lehehari.

Nelja odaotsa putkes olevast puidust saadi radioaktiivse süsiniku dateeringud (tabel 1; jn 6). Teravovaalse teramikuga odaotste (TÜ 2309: 52, 53 ja 63) puit pärineb vanemast rooma rauaajast või nooremast eelrooma rauaajast. Rombja teramiku ja leheharjaga odaotsa (TÜ 2309: 72) vars dateeriti rooma rauaaja esimesse poolde.

Odaotsa TÜ 2309: 72 metallograafiline uuring näitas, et see on valmistatud ühest hea kvaliteediga terasest toorikust. Terasest on kogu odaots, mitte vaid teraosa, nagu see on uuritud Kohtla putkkirveste puhul. See näitab, et relvad olid prestiižsemad tooted kui tööriistad.

Odaotsi ja relvi üldse on Eesti eelrooma ning rooma rauaaja kalmetest leitud üliharva. Eelrooma rauaaja kalmetest on vaid kaks odaotsa katket. Rooma rauaaja kalmetest on seitse odaotsa. Nende pärinemine rooma rauaajast pole siiski kindel: need võisid ka rahvasterännuajal kalmesse sattuda. Kahjuks ei paku Eesti vanema rauaaja kivilalmed odaotste dateerimiseks ka suletud leiukontekste, sest reeglina on erinevate matuste panused kalmes segamini ja kalmeid on kasutatud sajan-deid. Muudest Eesti I aastatuhande keskpaigaga dateeritud peitleidudest on saadud 140 odaotsa.

Teravovaalse teramikuga odaotsad olid ka Soome rannikualal, Lätis, Leedus ja Skandinaavias laialdaselt kasutusel eelrooma rauaajast kuni eelviikingiajani. Rombikujulise lehega odaotsad olid samuti laialdaselt levinud, olles kasutusel peamiselt rahvasterännu- ja eelviikingiajal. Esileulatuvate lehenurkadega odaotsad olid 5.–8. sajandil laia geograafilise levikuga, jäädes arvukuselt alla teravovaalse ja rombja lehega odaotstele. Soomes kasutatakse sellise kujuga odaotste kohta nimetust Yliskylä tüüpi odaotsad. Lehari oli levinud Ojamaal, Soomes ja Lätis alates eelrooma rauaajast kuni 7. sajandini, idas ulatub nende levik kuni Oka jõgikonnani. Võimalik, et leheharjaga odaotsa oli keerulisem sepiatada, mistõttu olid need kallimad ja näitasid ühtlasi kandja kõrgemat staatust.

Odaotste koostiselt on Kohtla leiule kõige sarnasemad Alulinna ja Kunda leiud. Rikassaare leiu odaotsad on Kohtla komplektist selgelt erinevad: enamik Rikassaare odaotstest on rombja lehega, lisaks on selles ka kiskudega odaotsi. Kuna Rikassaare 6.–7. sajandil maasse jäänud leid on Kohtla rooma rauaagestest odaotstest selgelt hilisem, on erinevus ootuspärane.

Radiosüsinikudateeringud näitavad, et Kohtla odaotsad pärinevad kõige tõenäolisemalt vanemast rooma rauaajast, võimalik, et ka veidi varasemast ajast. Enamik Kohtla leiu odaotstest on putkega ja teravovaalse lehega. Seega sarnanevad Kohtla leiu odaotsad kõige enam mujalt Virumaalt peitleidudest ja Soome rannikualalt saadud vanema rooma rauaaja odaotstega. See näitab, et Kohtla odaotsad võidi valmistada just neis piirkonnas.

Kahjuks pole andmeid hindamaks, kui pikk oli aeg odaotsa või odavarre valmistamise ja leiukohta ladestumise vahel. Odaotsakomplekti ja saadud dateeringute sarnaste tulemuste põhjal võib siiski oletada, et esemed valmistati ning need sattusid leiukohta lühikese aja jooksul.