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TEXTILE REMAINS OF THE AVAR CEMETERY AT TISZAFÜRED-MAJOROS

Zsófia Bástı*

Textile objects, elements of clothing placed in graves are seldom conserved and poorly researched. However, they inform us not only about clothing itself but also about other functions of textiles. Systematic collection and examination of fabrics may shed light on the textiles used by people of a certain region and period and what is more, import textiles may be identified. The study presents the catalogue and analysis of the textile remains excavated in Tiszafüred-Majoros, the largest Avar period cemetery in today eastern Hungary (mid-7th to 9th century AD).

A sírokba helyezett textilből készült tárgyak, viseleti elemek ritkán konzerválódnak, s kevéssé kutatottak. Nemcsak a ruházkodásról árulkodnak, hanem számos használati funkciójuk is felmerülhet. A szövetek módszeres gyűjtése és vizsgálata képet adhat egy kisebb régió és korszak népei által használt helyi és import textíliákról. A tanulmány Tiszafüred-Majoros, a legnagyobb kelet-magyarországi avar kori temető (Kr. u. 7. sz. közepe – 9. század) szövetmaradványainak felgyűjtését és elemzését végzi el.

Keywords: *textile, Avar period, Tiszafüred-Majoros Avar cemetery, pseudomorph*

Kulcsszavak: *szövet, avar kor, tiszafüred-majorosi avar temető, pszeudomorf*

Introduction

Clothing elements, accessories and tools made of organic materials are rarely preserved due to the soil conditions of the Carpathian Basin. Permanently anaerob, dry or wet (marshland, ice, water) environment salt and the metal salts dissolving from metal objects can extend the duration of organic substances (Rast-Eicher 2017, 15–32). In Hungary, mostly textiles preserved by iron, bronze, silver or rarely gold objects are found from the Avar period (Öskü, Jutas: Rhé 1924, 54–56; Fajsz: Balogh, Kőhegyi 1999, 250, 252, 256; Alattyán: Endrei 1957, 312–313; Holiare /Alsógellér/, Štúrovo-Obid /Párkány-Ebed/, Komárno-Slovenské lodenice /Komárom-Hajógyár/: Dolejšová 1987, 386–389; Székkutas-Kápolnadűlő: T. Knotik 2003, 299–300; Vörs-Papkert: Költő, Rostás 2006). The textile remains in the Tiszafüred-Majoros Avar cemetery presented here have been preserved in the latter context.

The Avar age cemetery in Tiszafüred is situated in the Middle Tisza region. This region has been inhabited since Neolithic times as it was an excellent place to settle down on the left bank of the Tisza. The graveyard dating from the Avar period can be found in an area called Majoros outside the town. Prior to the construction of Weir II of the Tisza, in 1965–1972, archaeological excavations were carried out and 1282 Avar age graves were excavated by Éva Garam.

In this research the focus is on the analysis of textile remains and imprints and their interpretation. I dealt with the issues arising in connection with fabrics: a) what types of textiles were worn in the Avar period, b) can certain types of weaving be connected to concrete elements of clothing, c) is social hierarchy or status reflected by fabrics, and d) what long distance connection can be detected based on fabric remains? Due to the presumed differences between the regions, the findings are valid only for the cemetery or its close environment, not for the whole Avar age Carpathian Basin in general. In this cemetery the earliest graves can be dated to the mid-seventh century and the finds seem to show that the cemetery was abandoned some time in the 9th century (Garam 1995, Beilage 3). In the cemetery with 1282 graves, traces of textile could be identified on 115 iron or

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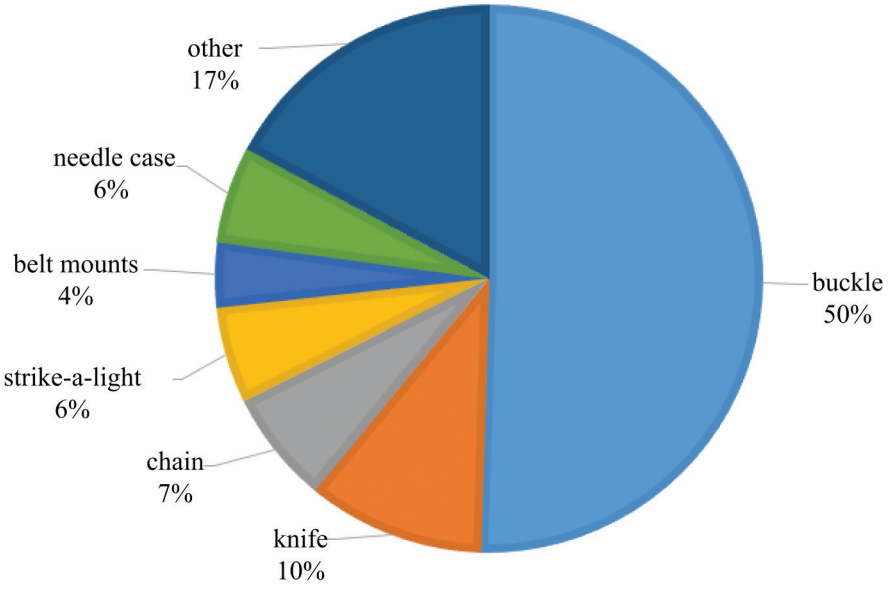

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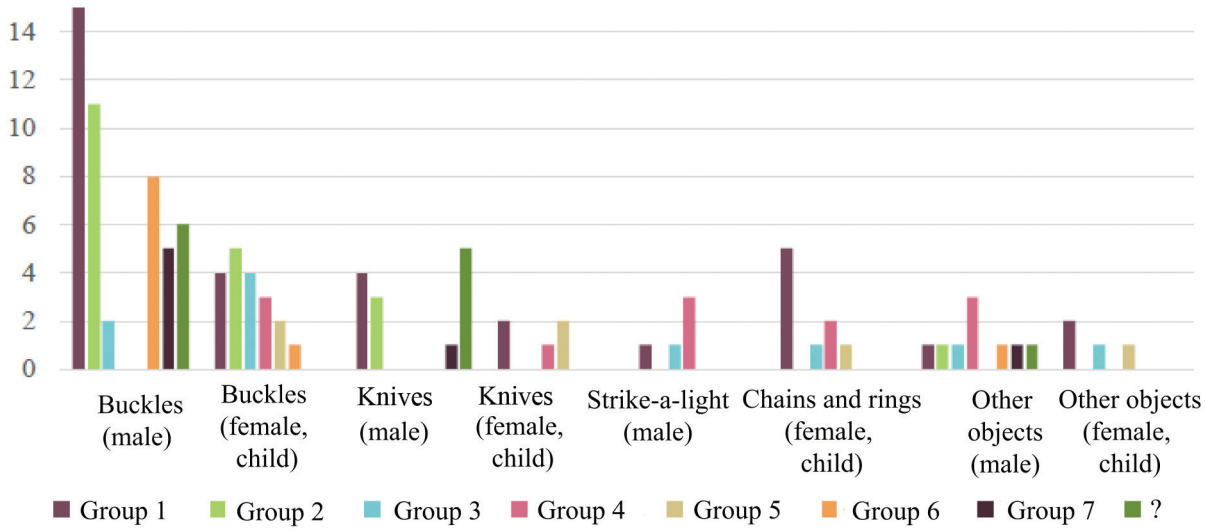

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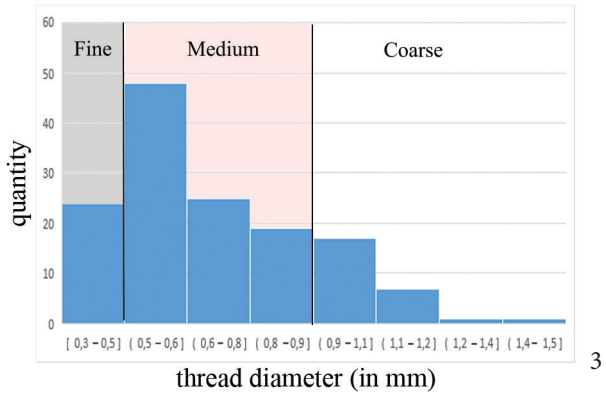

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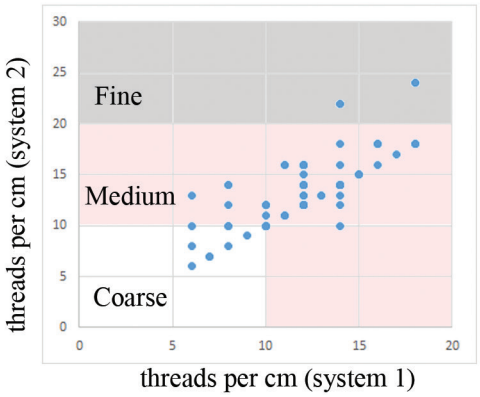

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Fig. 1 Diagrams characterising the occurrences of textile remains. 1: Distribution ratio of textiles on certain object types; 2: Co-occurrence ratio of textile types with anthropological categories and object types; 3: Yarn diameter of textiles; 4: Thread counts

1. kép A textilmaradványok előfordulási jellemzőit szemléltető ábrák. 1: A textilmaradványok eloszlási aránya egyes tárgytípusokon; 2: A szövetcsoportok megoszlása az elhunyt neme és a tárgytípus tekintetében; 3: A textilek fonalainak vastagsága; 4: A textilek fonalsűrűsége

bronze objects (*Table 1*). The data in the graph (*Fig. 1, 1*) reveal that most of them have been preserved corroded to iron buckles, but traces of fabric were observed on knives, chains, srike-a-lights, mounts, needle cases and other iron objects.

Grave goods were systematically examined in all the graves of the cemetery, carefully noting the grave and inventory numbers of the objects containing textile. Special attention was paid to the objects near the body: buckles, mounts and tools. The registered objects were arranged in a list and macro-photos were taken where the fabric remains can clearly be seen and interpreted. The description of the textile remains was made with the help of a magnifying glass and all the small deatails and observations were registered in a table (*Table 1*). The weaving types were specified with a manual UM012C-A digital microscope and then the objects were analysed with a stereomicroscope and photos were taken of them.[1] In the case of multiple fabric remains layered on one another, microstratigraphic analysis was executed, which is indespensable for their interpretation. Having drawn up the catalogue, the objects were organized into a table containing the identification number of the grave, inventory and ordinal number, the object category and its location in the grave, the weaving type of the textiles, the twist of its threads and their location on the object.

Based upon the table and the descriptions, the weaving types of textiles have been categorized into several groups, and their proportions were set up. According to their location, it was possible in several cases to connect fabric types to particular elements of clothing in the case of male, female and child graves. In many cases, these types of fabrics can be connected to other Avar age textile remains found both in Hungary and abroad (analyses of fabrics were published from several Avar period burial grounds: Székkutas-Kápolnadűlő: T. Knotik 2003, 299–300; Vörs-Papkert: Költő, Rostás 2006; Komárno-Lodenica (Komárom-Hajógyár: Dolejšová 1987, 386–389; Sommerein: Hundt 1984, 181–182; Frohsdorf: Scharer-Liška, Klatz, 2010; Leobersdorf: Hundt 1987; Zwölfaxing-Burstynkaserne: Grömer, Müller 2008, 17–21; Nuštar /Berzétemonostor/: Grömer, Rapan Papeša 2016).

Description of the textile remains

Textile remains were found together with iron or bronze objects in all cases. With the decomposition of metals, the crystalline substances dissolving from them conserved the textiles, although they lost their chemical characteristics, they retained their shape and have been preserved in a crystallized, so called pseudomorph form. Corrosion is indicated by brownish, yellowish and in the case of bronze, greenish color. Brownish decoloration is caused by iron-oxide, and the black spots by iron-sulfide (Cronyn 1996, 254).

In several instances corrosion completely permeated and covered the fabric, so its weaving type, the twist of the threads and its original material couldn't be identified (the mineralization process of the fabric see: Gillard et al. 1994). In such cases we can only infer the presence of textile by a stereomicroscopic analysis but not its characteristics. Due to the strong corrosion the basic material of the textile could not be detected in any of the cases. Some textile remains did not corrode on their whole surface, with a microscope the organic substance that was not corroded could be identified, however, samples could not be taken. To decide whether the textiles are of plant or animal origin (i . e. cellulose or protein based) a SEM analysis is required.[2] In this case, light microscopes do not provide a solution as metals are not translucent and the structure of the textile fiber cannot be seen (Anheuser, Roumeliotou 2003; Rast-Eicher 2017, 31).

The raw material of the textile remains

In 22 cases, SEM an FTIR analysis were executed in order to determine the raw material of the textiles. The samples have been selected on the basis of the state of preservation and weaving structure of the textile remains. In one instance, the raw material remained unidentifiable due to the large extent of corrosion. The identifiable samples proved to be of plant origin, probably of flax or hemp.[3]

The twist of the threads in the textile remains

Fabrics are made up of threads and several filaments are twisted into a thread. According to the twists of the fibers threads with Z and threads with S twist have been differentiated (Bender-Jørgensen, Grömer 2013, 100). Bender-Jørgensen's collection seems to show that particular twist directions may characterize certain regions. It probably derives from the method of weaving, which has several techniques and they may have differed in various regions (Bender-Jørgensen 2012, 128–132). Moreover, the fibers of some basic materials have a natural twist which they

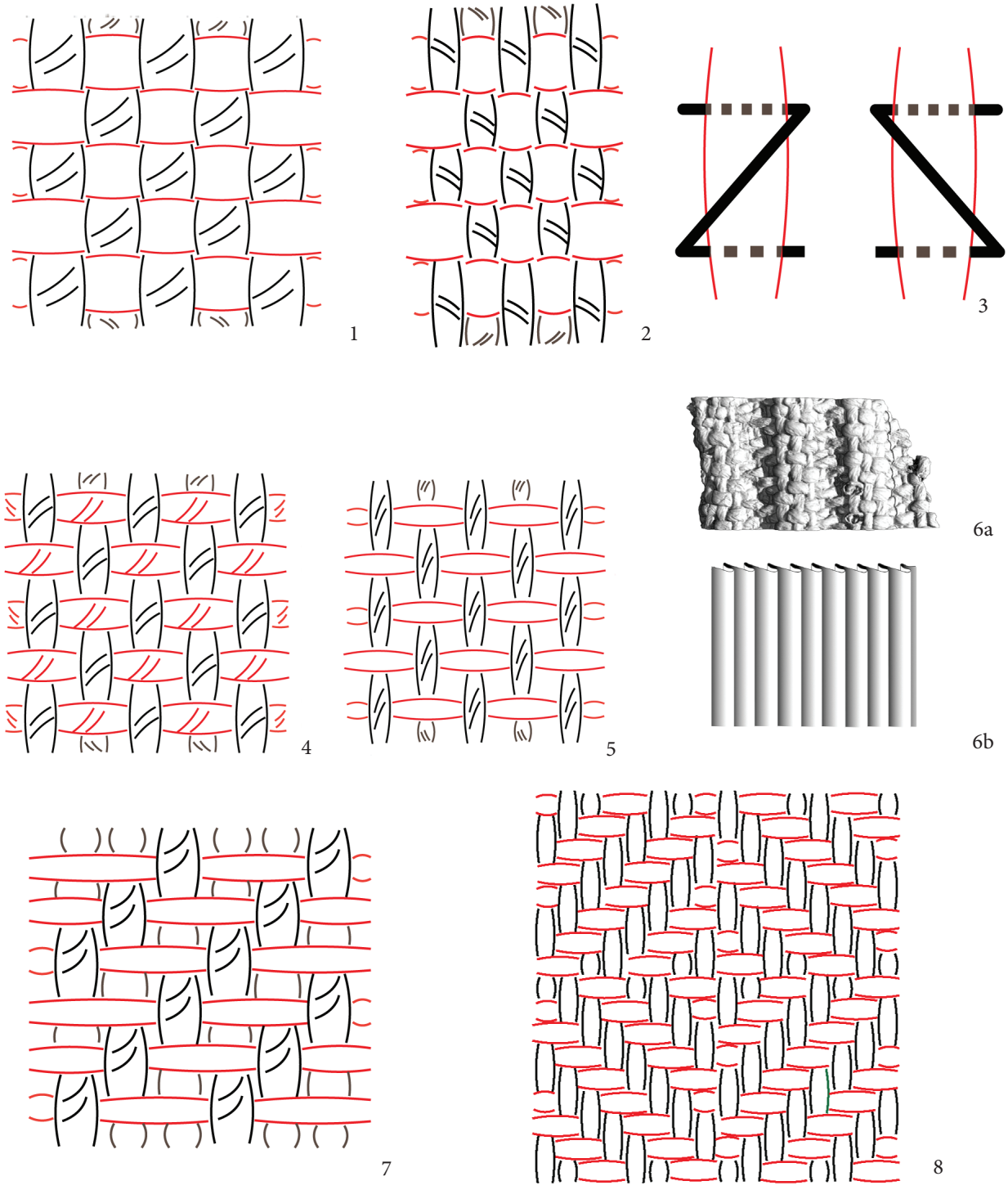

Fig. 2 Weaving types in the cemetery. 1: Textiles of compact tabby weave and equal thread diameter from both directions (Group 1); 2: Tabby textiles of different thread diameters (Group 2); 3: Z-single yarn (left direction) and S-single yarn (right direction); 4: Light fabrics of tabby weave (Group 3); 5: Tabby weave, airy textile (Group 4); 6: Textiles with three-dimensional linear structure; a: barred damask (Rippenköper); b: round pleats (round plissé) (Grömer, Rast-Eicher 2019, Fig. 1; 85); 7: 2/1 twill (Group 6); 8: Broken diamond twill (Group 7)

2. kép A temetőben előforduló kötéstípusok. 1: Tömör, egyenletes fonalvastagságú vászonkötés (1. csoport); 2: Tömör, változó fonalvastagságú vászonkötés (2. csoport); 3: Z (bal) és S (jobb) irányba sodort fonal; 4: Laza vászonkötés (3. csoport); 5: Gézszerű vászonkötés (4. csoport); 6: Háromdimenziós lineáris szerkezetű textíliák (5. csoport); 6a: bordázott sávoly (Rippenköper/barred damask); 6b: Egyirányba hajtott, kerek pliszé (round plissé) (Grömer, Rast-Eicher 2019, Fig. 1, 85); 7: Sávolykötés (6. csoport); 8: Törtgyémántsávoly kötés (7. csoport)

assume when drying, it may help in identifying the material. In the stem of a plant clusters of cells can be seen which are made up of elementary cells consisting of microfibrillae (cellulose is its constituent). The fact that elementary cells are in cell clusters is also telling about the basic material. Flax, nettle and ramie twist into an S shape, whereas hemp and jute are twisted in the shape of Z when drying. By examining the orientations of crystal grains and fibers together the basic plant substance can be specified more exactly (Bergfjord, Holst 2010, 1192–1193). To identify the quality of textiles, I examined the twists of the threads. Wefts and the warps could only be detected in one textile remain as they could only be clearly detected by observing the fringes of the textile. In this one case the warps and wefts could be identified: on the buckle found in Grave 661 (*Fig. 5, 4*) – which was found at the head of the femur – the fringe of the fabric constituting the upper layer was preserved. Its wefts are located much denser alongside one another than the warps. Nevertheless, in the other cases the functions of the threads going in two directions can only be guessed. The technology of weaving leads us to suppose that warps are tenser than wefts, but it cannot be taken for granted when it came to identification (Brnada et al. 2016, 222).

The analysis allowed to identify various twist angles. Strongly twisted threads could have been much more durable, and the pattern of the twill has stronger contours. A stronger twist was detected in broken diamond twills. In twill weaves it can be observed in several cases that warps and wefts have different twists. It is not to be connected to a particular type of twill as a rule, they occur both in warp face twills and in weft face twills and in broken diamond twills. In the case of the latter twill I managed to observe that thread going in one direction are hardly twisted or not twisted at all. Probably, these untwisted, thinner threads are the wefts. In general, it can be stated that the threads in textiles made with tabby weaves are made up of z-single yarns almost without exception whereas those made with twill weave consist of threads with both z- and s-single yarn (*Table 1*).

The types of weaves in textile remains

Based upon their weave types, textile remains have been assigned into seven groups. In many cases due to the small size of the fragment and the jumbled threads the structure of the weave could not be clearly determined or in the case of twill weaves, they could not be categorized into types. In these cases, tabby and twill weave points were registered. Where binding points could not be identified, these were considered to be unidentifiable.

To Group 1 (*Fig. 2, 1; Figs 3–6*) textiles of compact tabby weave and equal thread diameter from both directions were assigned (*Fig. 2, 1*). This group is the most numerous (E. Nagy et al. 1993, 31). With regard to the density of their warps and wefts these fabric remains are the same or just slightly different, their binding points are extremely dense. They were made of z-single yarn with few exceptions. The type was observable mostly on the back side of buckles, knives (sometimes on both sides) and other iron objects. The density of threads ranges widely from 8 threads/cm to 22 threads/cm, with thread diameter 0.28 to 1.5 mm. This type of tabby weave is mainly characteristic of males.

Group 2 (*Fig. 2, 2; Figs 7–8; Fig. 9, 1–3*) is made up of fabrics of different thread diameters, also tabby weave (E. Nagy et al. 1993, 31). It is a peculiarity of these fabrics that the density of their threads is different in either direction, but their binding points are dense like those of the previous group (thread densities of 8/10, 12/14 and 12/16 cm are often among them). The thread diameter measures between 0.27 and 1.81 mm. This type can be found both in female, male and child graves, they were mostly preserved corroded to the backsides of buckles. The twist of their threads is z-shape both in wefts and in warps.

Group 3 (*Fig. 2, 4; Fig. 9, 4–6; Fig. 10; Fig. 11, 1–3*) contains light fabrics of tabby weave which could be identified on various surfaces (E. Nagy et al. 1993, 31). They are chracterised by threads twisted in z-single yarn and fewer their binding points are not located closely to each other, which could have made the textile feel finer and less compact. They were found mainly in female graves corroded to needle cases. Their thread density ranges from 8 threads/cm to 15 threads/cm with 0.36–1.48 mm thread diameter, being fairly the same in both directions.

Tabby weave, gauze-like textile remains make up Group 4 (*Fig. 2, 5; Fig. 11, 4–8; Fig. 12, 1–4)* (E. Nagy et al. 1993, 31). Their threads have z-single yarn and were preserved on various iron objects both in male and in female graves. These fabrics have few binding points resulting in a gauze-like fabric. The thread density ranges from 6 to 14 threads/cm. Their classification was not based on the indentical thickness

Fig. 3 Macrophotos of textiles belonging to the Group 1. 1: Grave 17; 2: Grave 66; 3: Grave 241; 4–5: Grave 262; 6: Grave 266; 7: Grave 297

3. kép Az 1. csoportba tartozó textilmaradványokról készült makrofotók. 1: 17. sír; 2: 66. sír; 3: 241. sír; 4–5: 262. sír; 6: 266. sír; 7: 297. sír

Fig. 4 Macrophotos of textiles belonging to the Group 1. 1: Grave 422; 2: Grave 447; 3–4: Grave 521; 5–7: Grave 588
4. kép Az 1. csoportba tartozó textilmaradványokról készült makrofotók. 1: 422. sír; 2: 447. sír; 3–4: 521. sír; 5–7: 588. sír

and density of warps and wefts. The thread diameter measures between 0.36 and 1.09 mm.

Textile remains with three-dimensional linear structure represent the Group 5 (*Fig. 2, 6; Fig. 12, 5–6; Fig. 13, 1–6*). Due to their condition, the exact weaving structure cannot be determined. Two samples seem to be weaved in 2/1 twill and their surface is ribbed (Grave 498, *Fig. 13, 2*; Grave 661, *Fig. 13, 3*). The ribs were probably created by gathering the textile (plissé) or by special weaving type (barred damask) (Grömer, Rast-Eicher 2019, 84–86). Thread diameter of Group 5 measures 0.35–1.09 mm and the density ranges between 8–14 threads/cm. They were excavated in great numbers in female graves together with objects found near the waist. The twists of the threads (z-single yarn in both directions) and the density of threads could be identified only in two cases (12 and 14 threads/cm in both cases). The other remains were preserved in bad condition. Thread diameter of textiles are 0.35–1.09 mm.

Several types of twill could be specified in the cemetery. I have assigned warp face twills and weft face twills into Group 6 (*Fig. 2, 7; Fig. 13, 7–8; Fig. 14*). As the fringes, selvedges and starting borders of fabrics have not been preserved, it cannot be determined which is the direction of the weft and which is that of the warp (E. Nagy et al. 1993, 32–33). This type of textile remains have almost exclusively been found in male graves, attached to buckles. The threads have z- and s-single yarn with two exceptions. Their thread density in the warp and in the weft direction is 12 and 18 threads/cm respectively with thread diameter between 0.2 and 1.34 mm.

The most attractive weaving type is the broken diamond twill which belongs to Group 7 (*Fig. 2, 8; Fig. 15; Fig. 16, 1–4*) (E. Nagy et al. 1993, 34–35). These were found mainly corroded to buckles in male graves. Their thread density ranges between 12 and 20 threads/cm and is higher in one direction due to the weaving technique. The twist of the threads is z- in one direction and s-single yarn or nearly untwisted in the other. Thread diameter measures between 0.29 and 1.03 mm.

Most of the textiles are made of medium coarse thread with yarn diameter between 0.5–0.9 mm. Fine and coarse threads were equally represented in the cemetery *(Fig. 1, 3)*. The count of threads shows similar picture: the medium coarse textiles are dominant, coarse fabrics occure sparsely and fine textiles are uncommon *(Fig. 1, 4*).

Various weaving types in the context of Avar age archaeological finds

In comparison with other Avar age textile remains, the finds in Tiszafüred show several resemblances. For this comparison, the textile remains from the following Avar age cemeteries could be made use of: Alattyán, Budakalász-Dunai-Kisföldek, Vörs-Papkert, Székkutas-Kápolnadűlő, Komárno-Lodenica (Komárom-Hajógyár), Nuštar (Berzétemonostor), Sommerein, Leobersdorf, Frohsdorf, Zwölfaxing-Burstynkaserne. The identified groups have appeared in other excavation sites too. For instance, compact tabby weave (due to its simplicity) was widely favoured in this period, since it has been found in huge numbers in many sites. Most textile remains in the Zwölfaxing cemetery were made with compact tabby weave made up of threads with z-single yarn. The other variant of this is the tabby weave textile weaved from threads with s- and s-single yarn, but it is found less frequently in graves (Grömer, Müller 2008, 14–18). I did not come across such weave type among the textile remains found in Tiszafüred.

According to Hundt's findings, tabby weave dominates in the Leobersdorf cemetery too, the fabrics were mainly made of flax. Here, textiles were also made of threads with z-single yarn except for wool fabric made with twill weave made up of threads with s-single yarn. These fabrics have a low density of threads, but due to the frequent binding points and the thickness of the threads, the textile is compact (Hundt 1987, 9–10).

The textiles found in Grave 298 in the Frohsdorf cemetery and in the graveyards in Zwölfaxing and Sommerein were also made with tabby and twill weave (Scharer-Liška, Klatz 2010, 135–136; Hundt 1984, 181). Moreover, some counterparts of this weave type have been found in sites in Nuštar (Berzétemonostor) in Croatia, in Komárno-Lodenica (Komárom-Hajógyár), Slovakia, in Alattyán, Székkutas-Kápolnadűlő and Vörs-Papkert in Hungary (Endrei 1957, 312–313; Dolejšová 1987, 387; T. Knotik 2003, 299–300; Költő, Rostás 2006, 130–132; Grömer, Rapan Papeša 2016, 57–59). Taking all these into account, we can conclude that tabby weave fabrics were widespread and were used with numerous elements of garment.

Textiles with three-dimensional linear structure are relatively common all over Europe. The barred damask (Rippenköper) occurs frequently in the area

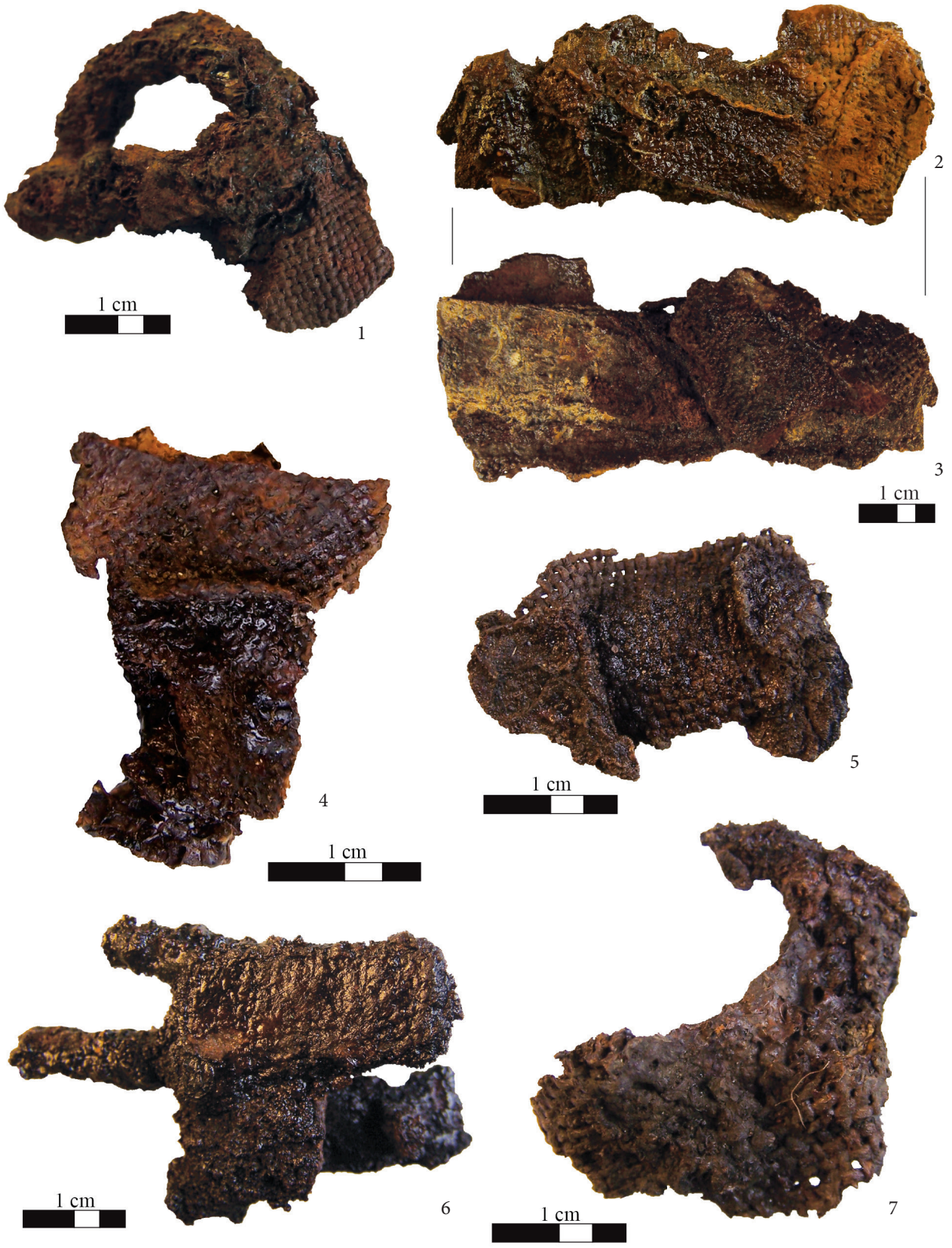

Fig. 5 Macrophotos of textiles belonging to the Group 1. 1: Grave 537; 2–3: Grave 601; 4: Grave 661 (buckle 1); 5: Grave 776; 6: Grave 785; 7: Grave 824

5. kép Az 1. csoportba tartozó textilmaradványokról készült makrofotók. 1: 537. sír; 2–3: 601. sír; 4: 661. sír (I. vascsat); 5: 776. sír; 6: 785. sír; 7: 824. sír

Fig. 6 Macrophotos of textiles belonging to the Group 1. 1: Grave 869; 2: Grave 896; 3: Grave 937; 4: Grave 948; 5: Grave 1111; 6: Grave 1126; 7–8: Grave 1140; 9: Grave 1281

6. kép Az 1. csoportba tartozó textilmaradványokról készült makrofotók. 1: 869. sír; 2: 896. sír; 3: 937. sír; 4: 948. sír; 5: 1111. sír; 6: 1126. sír; 7–8: 1140. sír; 9: 1281. sír

Fig. 7 Macrophotos of textiles belonging to the Group 2. 1: Grave 8; 2: Grave 44; 3: Grave 126; 4: Grave 208; 5: Grave 453; 6: Grave 488
7. kép A 2. csoportba tartozó textilmaradványokról készült makrofotók. 1: 8. sír; 2: 44. sír; 3: 126. sír; 4: 208. sír; 5: 453. sír; 6: 488. sír

east of the Rhine and in Southern Germany, as well as in Switzerland, especially in the 7th century. These fabrics are often made of linen, with 1/2 and 2/1 twill (sometimes 3/1–1/3) changing after three or five weft threads, which creates pleats automatically (*Fig. 2, 6. a*; Grömer, Rast-Eicher 2019, 86). Barred damask are occasionnaly combined with herringbone twill, which is typically an Alemannic feature (Carré et al. 2018; Grömer, Rast-Eicher 2019, 95).

Another type of three-dimensional linear structure textiles is the plissé technique, which seems to be connected to the elite (*Fig. 2, 6. b*). All samples of 6th and 7th century plissé have been found in France, Germany and Switzerland, except of remains in Sutton Hoo (GB) and Italy (Carré et al. 2018; Grömer, Rast-Eicher 2019, 95). Fabric remains woven with twill are frequently found from the Avar period. Walter Endrei registered a few cases in the Alattyán cemetery (Endrei 1957, 312–313). Taking into consideration the graveyards the comparison is based on, twills could be observed in several cases, but it never dominates over tabby weave. Broken diamond twills or similar fabrics were not found in any of the researched sites. This type is common in the northern, southern and eastern parts of present-day France, but appears also in the eastern area of Switzerland, and sparsely in South Switzerland (Carré et al. 2018, Fig. 41).

Some types of weaving used in Western Europe are absent in the graves in Tiszafüred. The 2/2 twill bindig was not found in the cemetery, but it occurs frequently in Switzerland and East France as well as in Austrian cemeteries. The spin patterned tabby textiles are not known from Tiszafüred, either. The technique was used mainly in eastern Switzerland, Austria, and in eastern and northern regions of France (Carré et al. 2018, Fig. 41).

Concerning the raw material, the Tiszafüred cemetery is characterized by textiles made of plant bast fiber (flax or hemp), animal fibers are absent. Other contemporaneous cemeteries outside of the Carpatian Basin contain textiles made of animal hair relatively often, f.e. Sommerein (Hundt 1984), Zwölfaxing (Grömer, Müller 2008), Nuštar (Grömer, Rapan Papeša 2016). The lack of silk material in Avar age graves is remarkable.

The interpretation of the textile remains

The grave goods have been analysed in each group in order to decide whether there is any connection between the equipment and the various types of fabrics (the comparison was based upon *Table 1*). All types of textiles were found both in poor graves and in well furnished ones with more elaborated equipment. Textile remains with broken diamond twill could only be observed in one Late Avar grave (Grave 680) along with a complete belt set, a strike-a-light, an iron knife and coffin clamps (Garam 1995, Taf. 111). No logical connection can be detected between the equipment of the graves and the particular fabric types. Due to its appearance and its provenience from outside the Carpathian Basin broken diamond twill may have represented a higher value in itself even if it occurred together with less valuable grave goods. It would provide us with a more detailed picture if we could not only identify the type of fabric but also the basic material or we could assume their connection to elements of clothing. Thus the particular pieces of over and undergarment could be separated and compared.

Interpreting the textile remains is a difficult task because of their bad condition and scarcity. Textile remains corroded to iron buckles were found in the greatest number. In the case of complete and well-preserved items it could be determined whether the textile remain is on its front or back side, but in the case of fragments it was not possible. A buckle was found with textile remains on both sides (child grave No. 66). The buckles with textile remains only on their back sides are supposed to have preserved a scrap of the overgarment. Fabric remains preserved in two layers – if their position on the object is known – can be interpreted in various ways. The lower layer on the back side of the buckle must have been an element of the overgarment whereas the upper layer must have been part of the undergarment, so the belt was worn on the overgarment holding together both the over and the undergarment. The upper layer of the two fabric layers preserved on top of each other on the front side of the buckle must have belonged to the overgarment whereas the fabric below it must have been an element of the undergarment (Grave 1111, Grave 1140). In some cases it can be supposed that belts were also worn covered by a longer undergarment. It is supported by the fact that according to the written, pictorial and archaeological sources, in that period men wore a piece of undergarment below the long robe, which was similar to the overgarment (Samashev et al. 2016, 161–165). The upper layer corroded to the front plate of buckles may have derived from the shroud covering the deceased person, if the position of the dead

Fig. 8 Macrophotos of textiles belonging to the Group 2. 1: Grave 499; 2: Grave 620; 3: Grave 621; 4: Grave 631; 5: Grave 790; 6: Grave 931

8. kép A 2. csoportba tartozó textilmaradványokról készült makrofotók. 1: 499. sír; 2: 620. sír; 3: 621. sír; 4: 631. sír; 5: 790. sír; 6: 931. sír

Fig. 9 Macrophotos of textiles belonging to the Group 2. 1–2: Grave 1208; 3: Grave 1149. Macrophotos of textiles belonging to the Group 3–4: Grave 66 (buckle 2); 5: Trench LX; 6: Grave 10 (Group 4)
9. kép A 2. csoportba tartozó textilmaradványokról készült makrofotók. 1–2: 1208. sír; 3: 1149. sír. A 3. csoportba tartozó textilmaradványokról készült makrofotók. 4: 66. sír (II. csat); 5: LX. szelvény; 6: 10. sír

Fig. 10 Macrophotos of textiles belonging to the Group 3. 1: Grave 40; 2: Grave 261; 3–4: Grave 422; 5: Grave 495; 6: Grave 577; 7: Grave 621

10. kép A 3. csoportba tartozó textilmaradványokról készült makrofotók. 1: 40. sír; 2: 261. sír; 3–4: 422. sír; 5: 495. sír; 6: 577. sír; 7: 621. sír

body (limbs tightly closed together) allows us to suppose that the deceased person might have been covered with a shroud. With a few exceptions there was no example of the former in the Tiszafüred cemetery. The bodies laid in Graves 360, 680, 737 and 1277 are supposed to have been wrapped in a shroud. The leg bones were located tightly next to one another, and the same is indicated by the position of the clavicles and the hand lying on the pelvis (Garam 1995, 170).

In the case of textile remains preserved in two or more layers, it can be observed that they were of different quality and weave structure. When it is clear that the fabric was found on the back side of the buckle, the textile of the upper layer (the one that must have belonged to the undergarment) has a finer structure than the layer that is closer to the surface of the buckle (Grave 869, Grave 974). Although in many cases it cannot be defined whether the textiles are preserved corroded on the back or the front side of the buckle (so they cannot be clearly connected to any elements of clothing) a difference in the fabrics can always be observed even if they have the same weave structure (Graves 577, 824, 661, 931, 1174).

84.1 % of the textiles corroded to the back side of iron buckles were found in male graves – not surprisingly as buckles were basically parts of male grave equipment in the Avar period. These were mainly made with smooth, compact tabby weave (Group 1), but occasionally broken diamond twills (Group 7), tabby weave with changing yarn thickness (Group 2), or loose tabby weave (Group 3) also occured. The textile remains on buckles where it was impossible to identify on which side the textile remains were found cannot be connected to any clothing elements (Grave 577, Grave 824). Textile can be observed on the front plate of the iron buckle and the strap retainer found in Grave 537 (*Fig. 5, 1*) and in male grave 1140 respectively (*Fig. 14, 5*), which can be interpreted as part of the overgarment.

With regard to female graves, on three buckles the textile remains were surely preserved on its back side (Graves 107, 208 and 974, on the latter one two layers of textile can be observed). The first buckle in Grave 661 with two layers of corroded fabric can also be assigned to this category. This goes to show that female overgarments were made with tabby weave, twill and tabby weave with changing yarn thickness. On the back side of the iron buckle found in Grave 974 (*Fig. 11, 1*) two layers of fabric can be seen, which can also be connected to the under- and overgarment. Textiles made with dense tabby weave with smooth yarn thickness are the most frequent. No buckles have been found in female graves where textile could be observed on its front side. The situation is similar in the case of child graves. However, it does not necessarily mean the lack of particular pieces of clothes that were probably in the male graves or a difference in clothes between female and child graves. Textile remains were found on two iron buckles: dense tabby weave and textile with three-dimensional linear structure. Based upon the textiles found in the Zwölfaxing graveyard, the latter one is connected to the undergarment (Grömer, Müller 2008, 20).

On some textiles conserved with the buckles, grooves and creases could be observed. It was supposed about the iron buckle found in female grave 974 that the textile remain was on its back side. I managed to observe two layers on it: the upper layer is gathered, which led to the conclusion that the overgarment used to be folded because if the overgarment is pressed down with a belt, similar pleats are produced. Such folded textile remain was found in Grave 46 in the Zwölfaxing cemetery. Because of the characteristic folds of the fabric remain, researchers suppose that the overgarment was loose, pressed down with a belt, which produced the pleats (Grömer, Müller 2008, 18). Due to its pleats, I interpret the lower layer of the textile found in Tiszafüred as a part of the overgarment, which could be a shirt, a tunic, a short robe with trousers or underskirt (in the case of female graves). In this case we may even suppose that sort of the pleating techniques was used (Grömer, Rast-Eicher 2016, 84–86). These types are sparse all over Europe and are known only from well-furnished graves, therefore it is considered a prestige commodity by researchers. This type of textile can be manufactured in various ways: by sewing, by pressing it between wooden boards, using a special grooved wooden press, by certain weaving structure or by twisting yarns in different directions. The production takes expertise and much time and the procedure must be repeated every time the item is washed – except for those that were pleated by sewing or twisting them –, so textiles made in this fashion must have been held luxury items and they were produced by specified workshops (B. Tóth, Sipos 2018, 486).

The scraps preserved on the strap retainers also indicate the fabrics of the over- and underclothing. Tabby weaves and twill weaves with different yarns can be observed on them, which is in accordance with the frequency of particular types of textiles found on the back sides of buckles (Graves 1140 and 1149).

Fig. 11 Macrophotos of textiles belonging to the Groups 3 and 4 (Group 3: 1–3, Group 4: 4–8). 1: Grave 974; 2: Grave 1065; 3: Grave 1071; 4: Grave 44; 5–6: Grave 46; 7: Grave 388; 8: Grave 422
11. kép A 3. és 4. csoportba tartozó textilmaradványokról készült makrofotók (3. csoport: 1–3, 4. csoport: 4–8). 1: 974. sír; 2: 1065. sír; 3: 1071. sír; 4: 44. sír; 5–6: 46. sír; 7: 388. sír; 8: 422. sír

Fig. 12 Macrophotos of textiles belonging to the Groups 4 and 5 (Group 4: 1–4; Group 5: 5–6). 1: Grave 723; 2: Grave 835; 3: Grave 1049; 4: Grave 1149; 5: Grave 41; 6: Grave 456
12. kép A 4. és 5. csoportba tartozó textilmaradványokról készült makrofotók (4. csoport: 1–4; 5. csoport: 5–6). 1: 723. sír; 2: 835. sír; 3: 1049. sír; 4: 1149. sír; 5: 41. sír; 6: 456. sír

Fig. 13 Macrophotos of textiles belonging to the Groups 5 and 6 (Group 5: 1–6; Group 6: 7–8). 1: Grave 482; 2: Grave 498; 3: Grave 661 (buckle 2); 4: Grave 872; 5: Grave 911; 6: Grave 1028; 7: Grave 107; 8: Grave 300
13. kép Az 5. és 6. csoportba tartozó textilmaradványokról készült makrofotók (5. csoport: 1–6; 6. csoport: 7–8). 1: 482. sír; 2: 498. sír; 3: 661. sír (II. csat); 4: 872. sír; 5: 911. sír; 6: 1028. sír; 7: 107. sír; 8: 300. sír

Fig. 14 Macrophotos of textiles belonging to the Group 6. 1: Grave 304; 2: Grave 402; 3: Grave 614; 4: Grave 706; 5: Grave 1140; 6: Grave 1178

14. kép A 6. csoportba tartozó textilmaradványokról készült makrofotók. 1: 304. sír; 2: 402. sír; 3: 614. sír; 4: 706. sír; 5: 1140. sír; 6: 1178. sír

We may suppose that in the case of female graves the textile remains on the needle cases can also be connected to the overgarment. They must have been worn strung on the textile ribbon dangling from the belt (László 1941, 189–190, 2. kép). A scrap of textile with unrecognizable weave was corroded to one end of a bone needle case found in Grave 76, probably the iron-oxide dissolving from the needle held in the needle case could have been the conserving substance. This is a singular case, I have found no parallel of it either in the Tiszafüred cemetery or in any other Avar age cemeteries. The scrap of textile may be the remain of the linen ribbon used to suspend the needle case or the remain of the overgarment.

The textile remains preserved on iron chains found near the waist in female graves can also be connected to the overgarment. (the possibility that textile ribbons were pulled through them can be refused due to the positions of the textiles as the fabrics never went through the holes of the chains.) Like the needle cases, these were worn fastened to the belt and served to fix various objects (Garam 2002, 162, 6. t.). The remain found in Grave 422 (*Fig. 11, 8*) was made with tabby weave, the yarns are Z-twisted and the fabric itself is not compact. The texture of the textile scrap found in Grave 1049 (*Fig. 12, 3*) conserved by a ring is less densely woven than the former one, its yarns are Z-twisted. Plaits can also be observed on this textile scrap, which may also indicate overgarment pressed down with a belt. The chains found near the neck vertebrae, which may have belonged to earrings with chains, must have preserved some fragments of the overgarment. These were mainly made with the various types of tabby weave (Schulze 1984, 331, Abb. 7).

In female Grave 588 (*Fig. 4, 5–7; Fig. 18, 3–5*), a rattle was found near the forearm on which a plaited textile with several layers was preserved. It is possible that the rattle was placed next to the woman's forearm wrapped in a textile bag with tabby weave. Nevertheless, due to its proximity to the body, it is more likely that the plaits of the overgarment can be observed on the surface of the rattle. The textile remains can be classified into Group 1.

The iron ring found in male grave 422 preserved a textile fragment. The fabric remain conserved to the iron ring must have belonged to the overgarment. The remains of a dense textile, made with tabby weave with identical thread thickness, can be seen on the ring.

The textile remains found on knives lend themselves to various interpretations. If textile remains can only be found on one side of the object, it must be the remnant of the overgarment. If there are textile remains on both sides and they are identical (probably belonging to one fabric), we may presume that the purse (if the knife was in it) was lined with fabric or that a textile knife case was worn. Based upon the findings in connection with Grave 14 in the Avar age cemetery in Bakonytamási, Gábor Ilon came to the conclusion that the purse must have been lined with textile as he found traces of some organic material on the object contained in the purse (Ilon 1995, 196). Wooden remains are often preserved on the surface of iron knives, based on which Dezső Csallány, among others, reconstructed a wooden knife case (Csallány 1960, 55–56; Balogh 2016, 263). In the Budakalász cemetery the textile remains on the wooden fragments could be identified as the decoration of the knife case or its cover. Based upon the textile remains on the knives found in Graves 262 and 601 (*Fig. 3, 4–5; Fig. 5, 2–3; Fig. 19, 1–2*) it is possible that the knives were wrapped in fabric before putting them in the grave. There are textile remains on both sides of the iron knife found in Grave 262. The two fabrics are very similar and on one side of the iron object plaits can be observed on it. In Grave 601 the various layers are more conspicuous. The fabrics have similar characteristics here too. According to K. Grömer and S. Müller, based upon the textiles found in Zwölfaxing, the fabrics discovered on knives or other everyday objects must have been the covers of these objects (Grömer, Müller 2008, 20). This allows the identification of the fabric remains on strike-a-lights with the remains of the protective wrapping on the objects.

In Grave 40, the skeleton of a horse was found with a lance next to it. There is a not dense textile scrap on it made of fine threads and with relatively frequent binding points, which can be seen on a big area but it does not constitute a continuous fabric. The position of the textile indicates that it was either used as packaging material (it is not very likely in the case of a spear with shaft), or a spear with a banner was placed next to the horse. Several depictions of banners are known from this period, on Jug No. 2 of the Nagyszentmiklós / Sânnicolau Mare treasure it can be seen in the image of the „victorious prince" (Bálint 2004, 360, 424, 136. kép). From Pseudo-Maurikios' description we are informed that banners similar to this one were used in the Byzantine army

Fig. 15 Macrophotos of textiles belonging to the Group 7. 1: Grave 126; 2: Grave 414; 3: Grave 621; 4: Grave 680; 5: Grave 687

15. kép A 7. csoportba tartozó textilmaradványokról készült makrofotók. 1: 126. sír; 2: 414. sír; 3: 621. sír; 4: 680. sír; 5: 687. sír

Fig. 16 Macrophotos of textiles belonging to the Group 7 and of unclassifiable textiles (Group 7: 1–4; unclassifiable: 5–8). 1: Grave 818; 2: Grave 871; 3: Grave 930; 4: Grave 967; 5: Grave 28; 6: Grave 31; 7: Grave 46; 8: Grave 1046
16. kép A 7. csoportba tartozó és csoportba nem sorolható textilmaradványokról készült makrofotók (7. csoport: 1–4; nem besorolható: 5–8). 1: 818. sír; 2: 871. sír; 3: 930. sír; 4: 967. sír; 5: 28. sír; 6: 31. sír; 7: 46. sír; 8: 1046. sír

too, following the example of the Avars („…their equestrian spears should be fitted with a strap in the middle and with a banner like those of the Avars…": Szádeczky-Kardoss 1992, 82). The spear with a banner appears in images from the Turkic period but it can be observed in Bulgaria, in the Altai region, in China, in the Volga region, among the Langobards in Italy and in Byzantium too (Csiky 2015, 148). Besides the spear found in Tiszafüred, some examples were found in the Budakalász-Dunai-Kisföldek cemetery, which were also woven in tabby (Básti 2019).

Summary

Based on the present collection and analysis, seven types of fabrics can be distinguished. Most textiles have been preserved on iron buckles. Due to their positions, they can be connected to the over- and undergarments, in some cases the placing of a funerary shroud into the grave can also be supposed. Fabrics from Group 1 are more frequently found in male graves whereas in female graves the textile types of Group 2 are more common. Everyday objects were either wrapped in fabric and placed in the purse or the purse was lined with textile or perhaps it was made of textile. In the case of knives it is possible that textile cases were worn, but the remains on them might as well have belonged to the overgarment. Needle cases, chains and iron fragments may also have preserved the remains of the fabric of the overgarment.

In *Table 1* it can clearly be seen that most textile remains (39 pcs) are assigned to Group 1 (dense tabby weave), but the number of those classified into Group 2 (21 pcs) and Group 3 (18 db) is also high. The fabric remains of Groups 5 (8 pcs), 6 (8 pcs) and 7 (10 pcs) are considered to be the rarest in the Tiszafüred cemetery. In one case I suppose that pleated textile was worn, which is sparsely found all over Europe.

Out of the weave types in Tiszafüred different types of tabby weave can be found in Austrian sites and other sites of the Carpathian Basin, and also half-basket weave was widely known. As to my present knowledge only broken diamond twill and pleated textiles were not found so far among Avar grave finds. A great number of parallels of broken twills and pleated textiles are described in areas at the North Sea and in the Baltic and are most probably identified as import goods in Avar environment. The level of grave equipment and the occurence of certain fabric types showed no consistent relationship: Group 7 identified as import fabrics appear in less well-equipped graves with one exception.

The analysis based upon the objects found in one cemetery points out the need for a systematic collection of Avar age textile remains, their thorough analysis and the creation of a data base so that the weave tachniques and textile basic materials used in that period could be identified. It is an important goal of the research to discover the features characteristic of particular regions and communities such as the typical weave type and twist of the yarn, perhaps the basic materials, clothing customs (e. g. detecting the quality features of fabrics used for overgarments). It may point out contacts between certain regions, which may indicate the interior distribution system and the textile types circulating in it (Szenthe, Gáll 2021). During the analysis of the textiles of different regions, the products of household industry and those of specified workshops are expected to separate, which leads us to the question of workshop areas (Andersson 2003, 46–47). By incorporating this region into international research, the issue of import can also be studied in more detail because we have no comprehensive textile data base for the Carpathian Basin, which is available for Western and Northern-European countries. Unfortunately, the fabric remains analysed here do not allow us to create reconstructions due to their bad condition, low number and small size. For this, bigger and continuous shreds are needed and textile remains with fittings or seams.

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Notes

1 Observations were conducted with a ZEISS SteREO Discovery.V8: zoom (6,3x-80x) stereomicroscope, and photos taken using a ZEISS AxioCam MRc5 (5MP) device. The ZEISS AxioVision 4.9.1 software version, and for photos with extended focus, the Helicon Focus 6.0 version were at disposal. The devices of ELTE-RI Archeometric Laboratory were purchased within the tender called „KMOP-4.2.1/B-10-2011-0002: Inter-

diszciplináris, innovatív kutatási irányok és az ipari kooperáció infrastrukturális hátterének fejlesztése valamint új oktatási technológiák bevezetése az ELTE-n (Interdisciplinary and innovative research directions and the development of the infrastructural background of industrial cooperation and the introduction of new educational technologies at ELTE)".

2 With a scanning electron microscope high resolution photos can be taken of the surface of the textile threads, which enables to identify the basic material of the fabric. In the case of non-translucent samples, this is the only method of identifying the basic material (Rast-Eicher 2017, 70–71; Varley 2006). Experiments have been conducted to identify the basic materials of mineralized (*pseudomorph*) textiles with FTIR (Fourier-transformation infrared spectroscopy), but no positive results have been achieved for completely mineralized fabrics (Jakes et al. 2007).

3 The paper was written as part of the project TKP2021-NKTA-24. Project no. TKP2021-NKTA-24 has been implemented with the support provided by the Ministry of Innovation and Technology of Hungary from the National Research, Development and Innovation Fund.

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Table 1

Grave number	*Sex*	*Object*	*Position of object*	*Position on the object*	*Weave group*	*Raw material*	*Thread density*	*Twist*	*Thread diameter (system 1)*	*Thread diameter (system 2)*
Section LX	–	Iron needle case	Stray find	–	Group 3	not analyzed	10/10	z/z	0.71 – 0.93	0.76 – 0.84
8	Male	Iron buckle	Vertebral column	Back side	Group 2	not analyzed	14/12	z/z	0.44 – 0.67	0.4 – 0.98
10	?	Iron buckle	Pubic bone	?	Group 3	plant bast fibre	6/10	z/z	0.73 – 0.96	0.84 – 1.07
17	Male	Iron buckle	Middle of the pelvis	?	Group 1	not analyzed	10/10	?	0.55 – 0.61	0.68 – 0.77
28	Female	Iron bucket (?)	?	Back side	string	plant bast fibre	–	z/s	yrn: 1.66 – 2; string: 3.63 – 4.81	
31	Male	Iron buckle	Middle of the pelvis	Back side	?	plant bast fibre	?	z/z	?	?
40	Horse	Iron spear head	To the right of the skeleton	–	Group 3	plant bast fibre	15/15	z/z	0.76 – 0.84	0.49 – 0.87
41	Female	Iron knife	Middle of the pelvis	One side	Group 5	not analyzed	8/14	z/z	?	?
44	Male	Iron buckle	Pelvis	Back side	Group 2	not analyzed	?	z/z	0.27 – 0.58	0.42 – 0.51
44	Male	Iron strike-a-light	Pelvis	One side	Group 4	not analyzed	9–10/9–10	z/z	0.48 – 0.81	0.36 – 0.66
46	Male	Iron strike-a-light	Above the right ilium	One side	Group 4	not analyzed	7–8/7–8	z/z	0.51 – 0.69	0.51 – 0.69
66	Child	Iron buckle (I.)	Pelvis	Front plate	Group 1	not analyzed	18/18	z/z	?	?
66	Child	Iron buckle (I.)	Pelvis	Back side	Group 3	not analyzed	8–9/?	z/z	?	?
66	Child	Iron buckle (II.)	Under the pelvis	Back side	Group 3	not analyzed	9–11/9–11	z/z	?	?
76	Female	Bone needle case	Between the femurs	–	?	not analyzed	?	?	?	?
107	Female	Iron buckle	Pelvis	Back side	Group 6	plant bast fibre	16–18/16–18	z/s	0.29 – 0.58	0.43 – 0.54
126	Male	Iron buckle	Pelvis	Back side	Group 2	unidentifiable	?	z/z	0.7 – 1.13	0.83 – 0.97
126	Male	Bronze buckle	Pelvis	Back side	Group 7	not analyzed	16/18	z/s	ca. 0.55	ca. 0.94
190	Male	Mount	Middle of the pelvis	Back side	imprint	not analyzed	?	?	?	?

Grave number	*Sex*	*Object*	*Position of object*	*Position on the object*	*Weave group*	*Raw material*	*Thread density*	*Twist*	*Thread diameter (system 1)*	*Thread diameter (system 2)*
208	Female	Iron buckle	Vertebral column	Back side	Group 2	not analyzed	?	z/z	ca. 0.48 – 0.56	ca. 0.48 – 0.56
240	Child	Iron chain	Cervical vertebrae	One side	Group 3	not analyzed	12–13/12–13	z/z	?	?
241	Female	Iron hinge	Pelvis	One side	Group 1	not analyzed	?	?	?	?
261	Female	Iron buckle	Left pelvic bone	?, Textile I	Group 3	not analyzed	?	?	?	?
261	Female	Iron buckle	Left pelvic bone	?, Textile II	Group 4	not analyzed	?	?	0.54 – 0.42	0.6 – 0.75
262	Female	Iron knife	Next to the left femur	Both sides	Group 1	not analyzed	14–15/14–15	?	0.52 – 0.66	0.42 – 0.67
266	Female	Iron needle case	Next to the left shin bone	–	Group 1	not analyzed	?	z/z	0.86 – 0.9	0.69 – 0.84
297	?	Iron buckle	Pelvis	Back side	Group 1	plant bast fibre	11–12/11–12	z/z	0.53 – 0.9	0.75 – 1.2
300	Male	Iron buckle	Ilium	Back side	Group 6	not analyzed	13–14/13–14	z/z	?	?
304	Male	Bronze buckle	Middle of the pelvis	Back side	Group 6	plant bast fibre	6/8	z/z	0.4 – 0.43	0.24 – 0.43
388	Male	Iron fragment	Pelvis	?	Group 4	not analyzed	?	?	0.55 – 0.81	0.73 – 1.09
402	Male	Iron buckle	Pubic bone	Back side	Group 6	not analyzed	?	?	?	?
414	Male	Back of a bronze mount	Pelvis	Back side	Group 7	plant bast fibre	8/14	z/z	0.28 – 0.58	0.39 – 0.56
422	Male	Iron ring	Vertebral column	One side	Group 1	not analyzed	15–16/15–16	z/z	0.9 – 1.13	0.85 – 1.23
422	Female	Iron needle case	Vertebra	–	Group 4	plant bast fibre	7–8/7–8	z/z	0.75 – 0.93	0.76 – 0.94
422	Female	Iron fragment	Vertebra	Both sides, several layers	Group 3	not analyzed	10–11/10–11	z/z	0.42 – 0.75	0.48 – 0.8
447	Male	Iron buckle	Left ilium	Back side	Group 1	not analyzed	11–12/11–12	z/z	0.66 – 0.1	0.51 – 0.81
453	?	Iron buckle	Next to the head of the right femur	Back side	Group 2	not analyzed	?	?	0.47 – 0.64	0.49 – 0.6
456	Male	Bronze mount	Middle of the pelvis	Back side	Group 5	not analyzed	?	?	?	?
464	Female	Iron chain with plate	Left ilium	One side	Group 1	not analyzed	?	z/z	?	?

Grave number	*Sex*	*Object*	*Position of object*	*Position on the object*	*Weave group*	*Raw material*	*Thread density*	*Twist*	*Thread diameter (system 1)*	*Thread diameter (system 2)*
482	Child	Iron buckle	Left ilium	Back side	Group 5	not analyzed	?	?	ca. 0.41 – 0.42	ca. 0.41 – 0.42
488	Child	Iron buckle	Pelvis	?	Group 2	not analyzed	11–12/16	z/z	0.64 – 0.89	0.54 – 0.8
495	Female	Iron chain	Left ilium	One side	Group 3	not analyzed	12/?	z/z	0.75 – 0.79	0.71 – 0.84
498	Female	Iron needle case	Next to the left femur	–	Group 5	not analyzed	?	?	0.35 – 0.72	0.6 – 0.69
499	Female	Iron knife	Next to the left forearm	One side	Group 2	not analyzed	?	?	?	?
509	Male	Iron buckle	Middle of the pelvis	Back side	?	not analyzed	?	?	ca. 0.62 – 0.83	ca. 0.62 – 0.83
521	Male	Iron fragment with a bronze ring	Next to the head of the femur	Both sides	Group 1	not analyzed	13–14/13–14	z/z	?	?
531	Male	Iron buckle	Left ilium	?	?	not analyzed	?	?	?	?
537	Male	Iron buckle	Pubic bone	Front plate	Group 1	not analyzed	15–16/15–16	z/z	0.85 – 0.91	0.95 – 1.41
577	Male	Iron strike-a-light	Next to the left shin bone	One side	Group 3	not analyzed	?	?	0.84 – 1.48	0.82 – 1.22
577	Male	Iron buckle	Next to the inner side of the head of the right femur	?, lower layer	Group 3	not analyzed	12–13/13–14	z/z	?	?
577	Male	Iron buckle	Next to the inner side of the head of the right femur	?, upper layer	?	not analyzed	?	?	?	?
588	Female	Rattle	Left forearm	Whole surface, Textile I	Group 1	not analyzed	14–15/13–14	z/z	0.67 – 1.11	0.83 – 1.03
588	Female	Rattle	Left forearm	Whole surface. Textile II	Group 1	not analyzed	10/12	z/z	0.65 – 0.98	0.72 – 0.98
601	Male	Iron knife	Next to the right knee	One side, upper layer	Group 1	not analyzed	11/11	z/z	?	?
601	Male	Iron knife	Next to the right knee	One side, middle layer	Group 1	not analyzed	?	?	?	?

Grave number	*Sex*	*Object*	*Position of object*	*Position on the object*	*Weave group*	*Raw material*	*Thread density*	*Twist*	*Thread diameter (system 1)*	*Thread diameter (system 2)*
601	Male	Iron knife	Next to the right knee	One side, lower layer	Group 1	not analyzed	10/11–12	z/z	0.5 – 0.77	0.63 – 0.97
601	Male	Iron knife	Next to the right knee	Other side, lower layer	v- shaped pattern	not analyzed	?	z/z	?	?
601	Male	Iron knife	Next to the right knee	Other side, upper layer	Group 1	not analyzed	12/13–14	z/z	0.57 – 0.62	0.49 – 0.55
614	Male	Iron buckle	Sacrum	?	Group 6	not analyzed	?	z/s	?	?
620	Male	Iron buckle	Vertebra	?	Group 2	not analyzed	11–12/16	z/z	0.54 – 0.81	0.49 – 0.66
621	Male	Iron knife	Next to the fore-arm	One side, lower layer	Group 2	not analyzed	?	?	?	?
621	Male	Iron knife	Next to the fore-arm	One side, upper layer	?	not analyzed	?	?	?	?
621	?	Iron buckle (complete)	Vertebral column	Back side	Group 3	not analyzed	?	?	ca. 1.12	ca. 0.95
621	?	Iron buckle (fragment)	Vertebral column	?	Group 7	not analyzed	12–13/15	z/s	0.63 – 0.91	0.59 – 1.34
631	Child	Iron buckle	Small pelvis	?	Group 2	not analyzed	?	?	?	?
661	Female	Iron buckle (I)	Head of femur	?, lower layer	Group 1	not analyzed	14/14	z/z	?	?
661	Female	Iron buckle (I)	Head of femur	?, upper layer	Group 2	not analyzed	12/14	z/z	?	?
661	Female	Iron buckle (II)	Pelvis	?	Group 5	not analyzed	12/14	z/z	0.52 – 0.64	0.64 – 0.81
680	Male	Iron awl	Next to the right femur	–	Group 7	not analyzed	18/?	z/z	0.35 – 0.38	0.33 – 0.65
686	Child	Iron fragment	Grave filling	One side	Group 1	not analyzed	?	?	?	?
687	Male	Iron knife	Pelvis	One side, lower layer	?	not analyzed	?	?	?	?
687	Male	Iron knife	Pelvis	One side, upper layer	Group 7	not analyzed	18/24	z/z	?	?
699	Male	Iron knife	Next to the left femur	One side	?	not analyzed	?	?	?	?

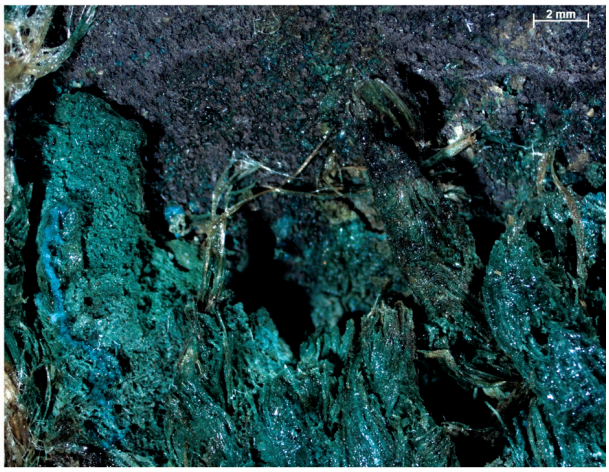
Grave number	*Sex*	*Object*	*Position of object*	*Position on the object*	*Weave group*	*Raw material*	*Thread density*	*Twist*	*Thread diameter (system 1)*	*Thread diameter (system 2)*
699	Male	Iron knife	Next to the left femur	Other side	Group 2	not analyzed	6–7/13–14	z/z	?	?
706	Male	Iron buckle	Edge of pelvis	?	Group 6	not analyzed	?	z/s	0.32 – 0.57	0.5 – 0.53
707	Female	Iron knife	Lleft ilium	One side	Group 1	not analyzed	12/12	z/z	0.69 – 0.86	0.69 – 0.86
723	Female	Iron chain	Next to the left femur	One side, lower layer	Group 4	not analyzed	8/8	z/z	0.65 – 0.77	0.96 – 0.99
737	Female	Iron ring with chain	Outer side of the head of the left femur	One side	Group 1	not analyzed	?	?	?	?
738	?	Iron knife	Small pelvis	Both sides	Group 1	not analyzed	12/12	?	?	?
772	Male	Iron buckle	Vertebral column	Back side	Group 1	not analyzed	18/18	z/z	0.54 – 0.68	0.54 – 0.68
776	Child	Iron buckle	Pelvis	?	Group 1	plant bast fibre	12/12	z/z	0.53 – 0.77	0.55 – 0.57
785	Male	Iron buckle	Left forearm	?	Group 1	not analyzed	?	?	?	?
787	Male	Iron strike-a-light	Next to the left ilium	One side	Group 1	not analyzed	?	?	?	?
790	Male	Bronze buckle	Middle of the pelvis	?	Group 2	not analyzed	12/14	z/z	1.07 – 1.67	0.85 – 1.81
811	Male	Iron buckle	Vertebral column	Back side	?	not analyzed	?	?	?	?
818	Male	Iron buckle	Pelvis	?	Group 7	not analyzed	18/18	z/z	ca. 0.37	0.33 – 0.53
824	Male	Iron buckle	Left ilium	?, upper layer	Group 2	not analyzed	8/10	z/z	ca. 0.5	ca. 0.5
824	Male	Iron buckle	Left ilium	?, lower layer	Group 1	not analyzed	10/10	z/z	0.66 – 0.95	0.6 – 0.81
835	Female	Iron buckle	Vertebral column	?	Group 4	not analyzed	14/10	z/z	?	?
869	Male	Iron buckle (big)	Right forearm	Back side	Group 1	plant bast fibre	16/18	z/z	0.71 – 1.5	0.77 – 1.02
869	Male	Iron buckle (small)	Right forearm	Back side, upper layer	Group 1	plant bast fibre	8/8	z/z	0.39 – 0.44	0.44 – 0.53
869	Male	Iron buckle (small)	Right forearm	Back side, lower layer	Group 2	plant bast fibre	8/10	z/z	0.52 – 1	0.62 – 1.13
871	Male	Iron buckle	Middle of the pelvis	Back side	Group 7	plant bast fibre	14/18	z/z	0.38 – 0.52	0.42 – 0.64

Grave number	*Sex*	*Object*	*Position of object*	*Position on the object*	*Weave group*	*Raw material*	*Thread density*	*Twist*	*Thread diameter (system 1)*	*Thread diameter (system 2)*
872	Female	Iron knife	Next to the left forearm	One side	Group 5	not analyzed	?	?	0.77 – 0.79	0.84 – 1.09
896	Male	Iron buckle	Grave filling	?	Group 1	not analyzed	10/12	z/z	0.45 – 0.72	0.65 –1
911	Female	Strap end	Left elbow	Back side	Group 5	not analyzed	12/14	z/z	0.39 – 0.55	0.44 – 0.57
930	Male	Iron buckle	Pelvis	?	Group 7	plant bast fibre	14/22	z/z	0.34 – 0.68	0.4 – 0.77
931	Male	Iron buckle	Pelvis	?, lower layer	Group 2	plant bast fibre	14/22	z/z	0.369 – 0.63	0.37 – 0.59
931	Male	Iron buckle	Pelvis	?, upper layer	twill binding points	plant bast fibre	?	?	?	?
937	Male	Iron buckle (1)	Inner side of right humerus	Back side	twill binding points	not analyzed	?	?	?	?
937	Male	Iron buckle (2)	Inner side of femur	?	Group 1	not analyzed	?	z/z	0.46 – 0.71	0.59 – 0.6
948	Female	Iron chain	Head of right femur	One side	Group 1	not analyzed	14/14	z/z	1.06 – 1.17	0.85 – 0.87
967	Male	Iron buckle (No. 6)	Head of right femur	?	Group 1	not analyzed	16/16	z/z	0.52 – 0.89	0.53 – 0.58
967	Male	Iron buckle (No. 7)	Next to the left forearm	Back side	Group 7	plant bast fibre	12/16	z/z	0.67 – 1.14	1.02 – 1.22
974	Female	Iron buckle	Next to the left femur	Back side, lower layer	Group 1	not analyzed	?	z/z	?	?
974	Female	Iron buckle	Next to the left femur	Back side, upper layer	Group 3	not analyzed	?	z/z	0.6 – 0.65	0.6 – 0.65
1008	Male	Armour fragment (?)	Next to the left humerus	One side	Group 1	not analyzed	?	?	0.44 – 0.62	0.44 – 0.62
1028	Female	Iron chain	Cervical vertebra	One side	Group 5	not analyzed	?	?	?	?
1046	Male	Iron knife	Right humerus	One side	?	not analyzed	?	?	?	?

Grave number	*Sex*	*Object*	*Position of object*	*Position on the object*	*Weave group*	*Raw material*	*Thread density*	*Twist*	*Thread diameter (system 1)*	*Thread diameter (system 2)*
1049	Female	Iron ring	Inside the forearm	One side	Group 4	not analyzed	10/12	z/z	?	?
1065	Male	Iron buckle	Pelvis	Back side	Group 3	not analyzed	12/12	z/?	0.54 – 0.67	0.61 – 0.77
1071	Male	Iron plate	Under the right iliac bone	One side (Textile I)	Group 4	plant bast fibre	6/6	z/s	?	?
1071	Male	Iron plate	Under the right iliac bone	Other side (Textile II)	Group 3	plant bast fibre	12/12	z/z	0.39 – 0.8	0.41 – 0.73
1097	Female	Iron tool	Next to the left forearm	One side	?	not analyzed	?	?	?	?
1111	Male	Iron buckle	Vertebral column	?, lower layer	Group 1	not analyzed	14/14	z/z	0.39 – 0.55	0.25 – 0.46
1111	Male	Iron buckle	Vertebral column	?, upper layer	Group 2	plant bast fibre	18/24	z/z	0.26 – 0.39	0.28 – 0.42
1126	Male	Iron buckle	Next to the right humerus	Back side	Group 1	not analyzed	12/12	z/z	0.56 – 0.96	0.66 – 0.85
1140	Male	Iron buckle	Pelvis	?, upper Layer (I)	?	not analyzed	?	?	?	?
1140	Male	Iron buckle	Pelvis	?, Layer II	Group 6	not analyzed	?	z/s	ca. 0.41 – 0.52	ca. 0.41 – 0.52
1140	Male	Iron buckle	Pelvis	?, Layer III	Group 1	not analyzed	12/16	z/z	0.32 – 0.4	0.28 – 0.345
1140	Male	Iron buckle	Pelvis	?, Layer IV	Group 2	not analyzed	?	?	?	?
1140	Male	Strap retainer	Next to the fore-arm	Front plate	Group 6	not analyzed	14/16	z/s	0.78 – 1.03	0.63 – 1.14
1140	Male	Strap retainer	Next to the fore-arm	Back side	?	not analyzed	?	?	?	?
1140	Male	Iron tool	Pelvis	One side, lower layer	Group 3	not analyzed	16/18	z/z	0.43 – 0.9	0.54 – 0.8
1140	Male	Iron tool	Pelvis	One side, upper layer	?	not analyzed	?	?	?	?
1149	Male	Iron strike-a-light	Next to the right humerus	One side (Textile I)	?	not analyzed	?	?	?	?

Grave number	*Sex*	*Object*	*Position of object*	*Position on the object*	*Weave group*	*Raw material*	*Thread density*	*Twist*	*Thread diameter (system 1)*	*Thread diameter (system 2)*
1149	Male	Iron strike-a-light	Next to the right humerus	One side (Textile II)	?	not analyzed	?	?	?	?
1149	Male	Iron strike-a-light	Next to the right humerus	One side (Textile III)	Group 4	not analyzed	8/12	z/z	?	?
1149	Male	Strap retainer	Next to the right humerus	One side	Group 2	not analyzed	12/16	z/z	0.56 – 0.93	0.67 – 0.81
1160	Male	Iron knife	Inner side of left forearm	One side	Group 2	not analyzed	12/16	z/s	0.47 – 0.73	0.41 – 0.48
1174	Female	Iron buckle	Outer side of right femur	?, lower layer	Group 4	not analyzed	14/14	?	?	?
1174	Female	Iron buckle	Outer side of right femur	?, upper layer	Group 3	not analyzed	?	?	?	?
1174	Female	Iron knife	Outer side of right femur	?	Group 4	not analyzed	14/14	?	?	?
1178	Male	Iron buckle	Between the femurs	Back side	Group 6	not analyzed	12/16	z/s	0.82 – 1.01	0.47 – 0.84
1208	Female	Iron buckle	Next to the head of the left femur	?	Group 2	not analyzed	12/14	z/z	0.77 – 0.79	0.29 – 0.6
1230	Female	Iron needle ca.se	Next to the right femur	-	Group 3	not analyzed	12/12	z/z	0.36 – 0.63	0.45 – 0.5
1268	Male	Iron strike-a-light	Next to the head of the right femur	One side	textile imprint	not analyzed	?	?	?	?
1272	Child	Iron buckle	Middle of the pelvis	?	textile imprint	not analyzed	?	?	?	?
1281	Male	Bronze buckle	Under the left iliac bone	?	Group 1	not analyzed	14/14	z/z	0.31 – 0.63	0.45 – 0.48

1



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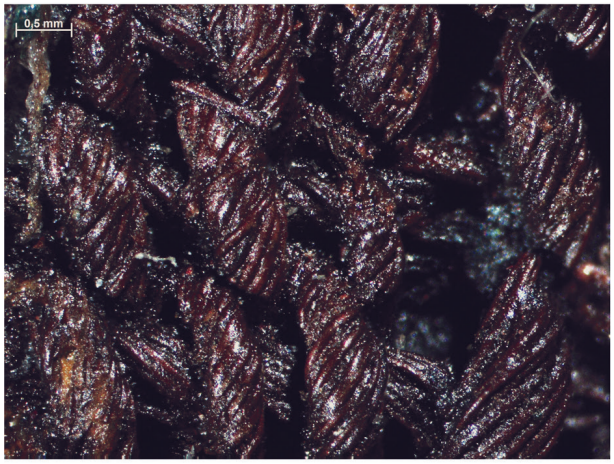
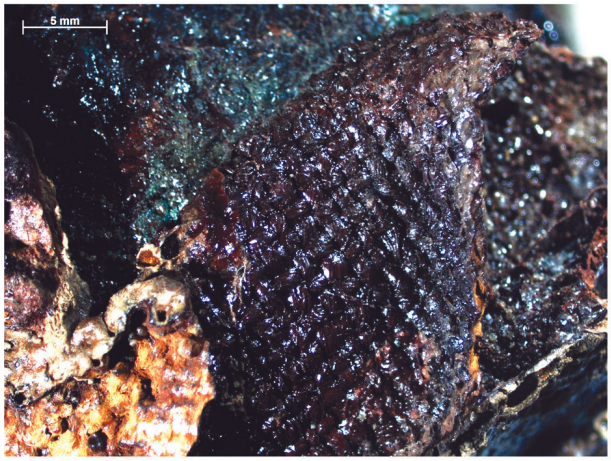
6

Fig. 17 Stereomicroscopic images of textile remains. 1: Grave 10; 2: Grave 28; 3: Grave 40; 4: Grave 41; 5–6: Grave 126
17. kép A textilmaradványokról készült sztereomikroszkópos felvételek. 1: 10. sír; 2: 28. sír; 3: 40. sír; 4: 41. sír; 5–6: 126. sír

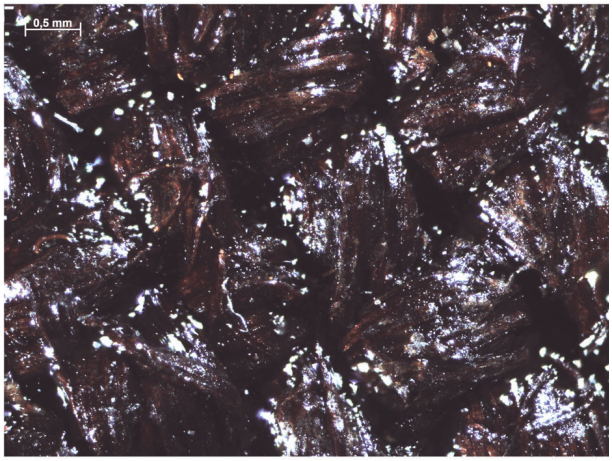


1

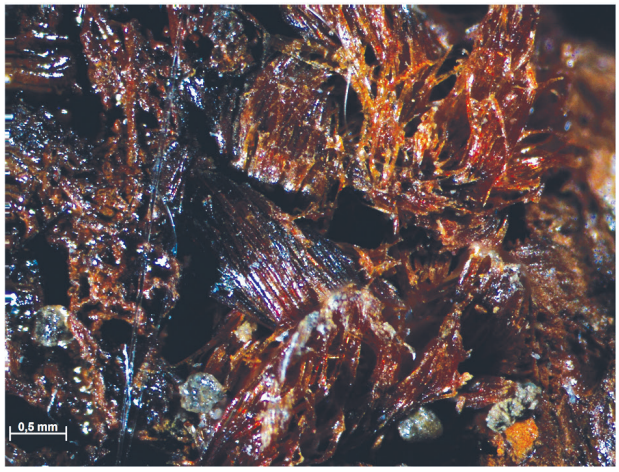
2



3



4



5

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Fig. 18 Stereomicroscopic images of textile remains. 1: Grave 304; 2: Grave 577; 3–5: Grave 588; 6: Grave 621
18. kép A textilmaradványokról készült sztereomikroszkópos felvételek. 1: 304. sír; 2: 577. sír; 3–5: 588. sír; 6: 621. sír

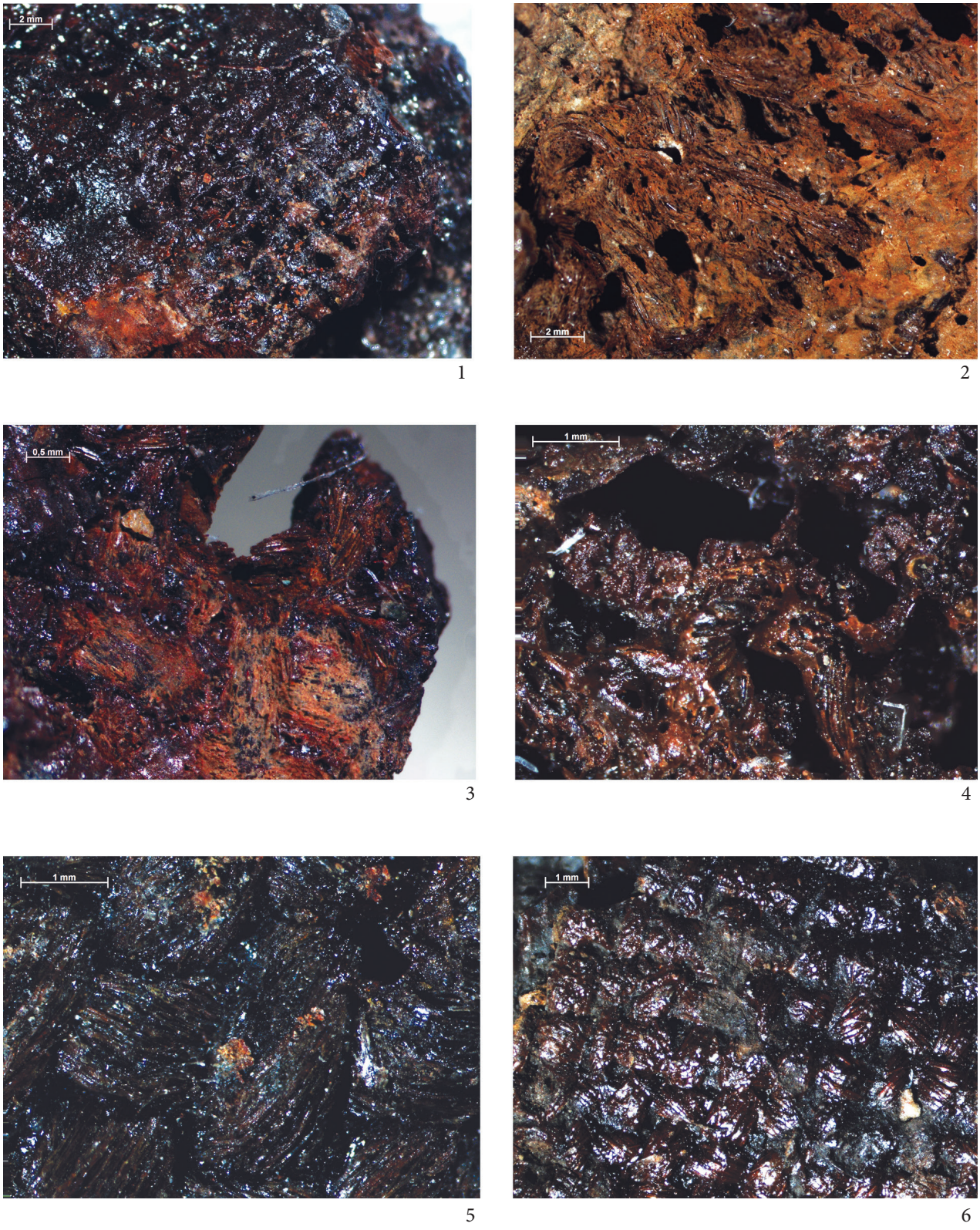
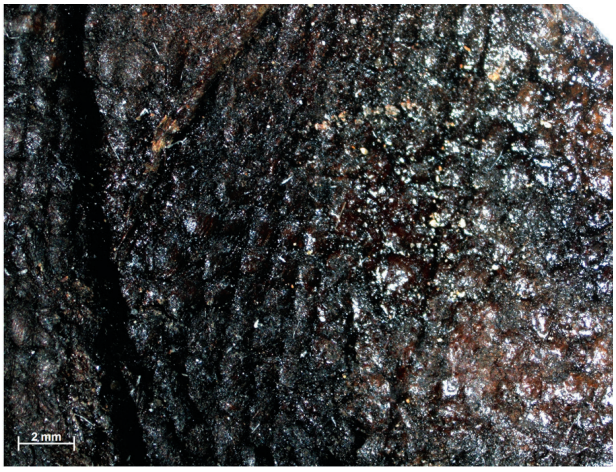


Fig. 19 Stereomicroscopic images of textile remains. 1–2: Grave 601; 3: Grave 661; 4: Grave 723; 5: Grave 790; 6: Grave 869

19. kép A textilmaradványokról készült sztereomikroszkópos felvételek. 1–2: 601. sír; 3: 661. sír; 4: 723. sír; 5: 790. sír; 6: 869. sír

1



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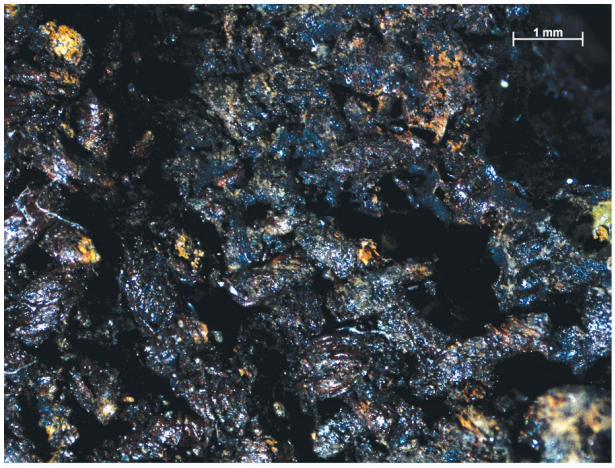

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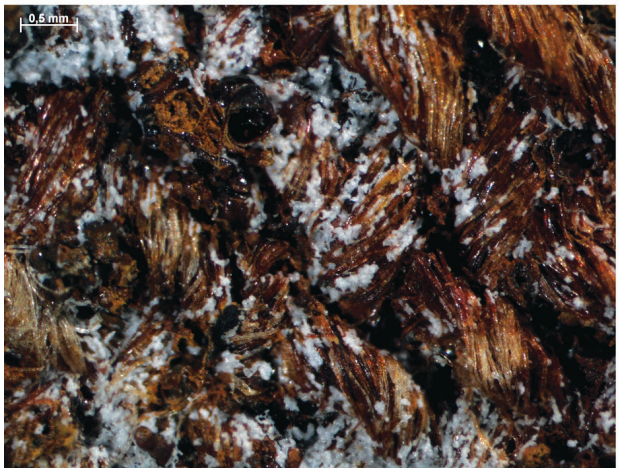

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Fig. 20 Stereomicroscopic images of textile remains. 1: Grave 873; 2: Grave 937; 3: Grave 111; 4: Grave 967; 5–6: Grave 1281

20. kép A textilmaradványokról készült sztereomikroszkópos felvételek. 1: 873. sír; 2: 937. sír; 3: 111. sír; 4: 967. sír; 5–6: 1281. sír

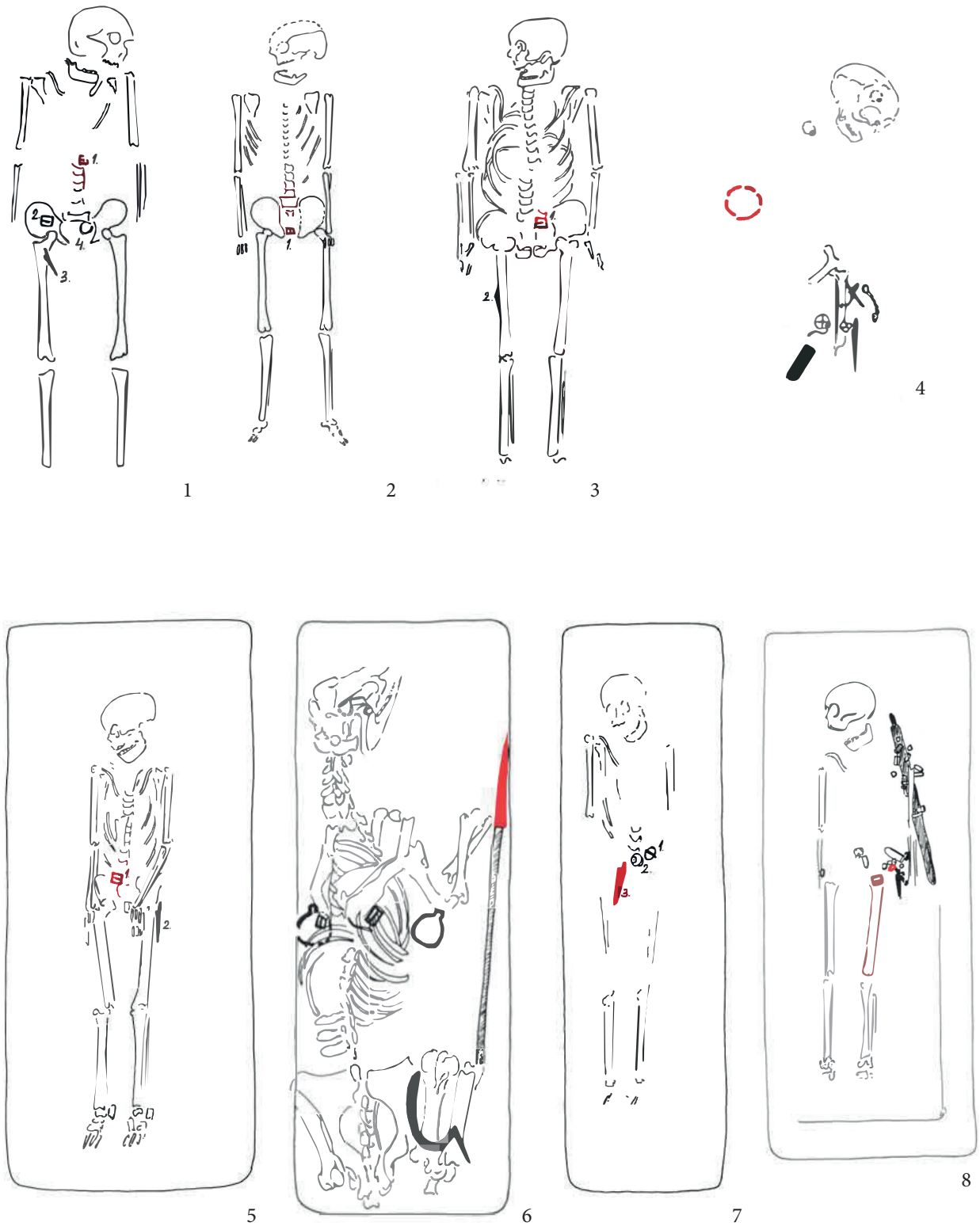

Fig. 21 Grave plans (objects with textile remains marked in red). 1: Grave 8; 2: Grave 10; 3: Grave 17; 4: Grave 28; 5: Grave 31; 6: Grave 40; 7: Grave 41; 8: Grave 44

21. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 8. sír; 2: 10. sír; 3: 17. sír; 4: 28. sír; 5: 31. sír; 6: 40. sír; 7: 41. sír; 8: 44. sír

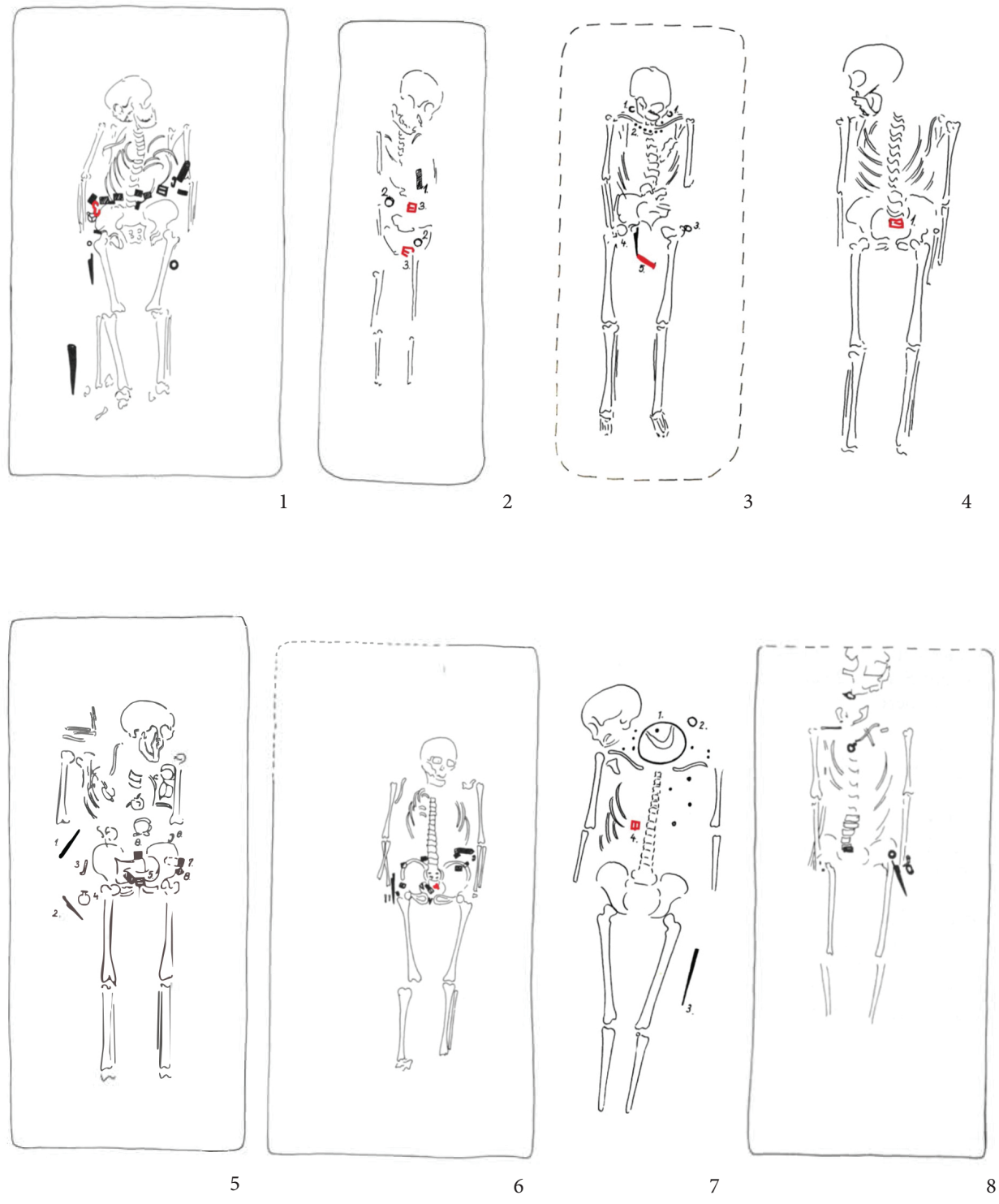

Fig. 22 Grave plans (objects with textile remains marked in red). 1: Grave 46; 2: Grave 66; 3: Grave 76; 4: Grave 107; 5: Grave 126; 6: Grave 190; 7: Grave 208; 8: Grave 240
22. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 46. sír; 2: 66. sír; 3: 76. sír; 4: 107. sír; 5: 126. sír; 6: 190. sír; 7: 208. sír; 8: 240. sír

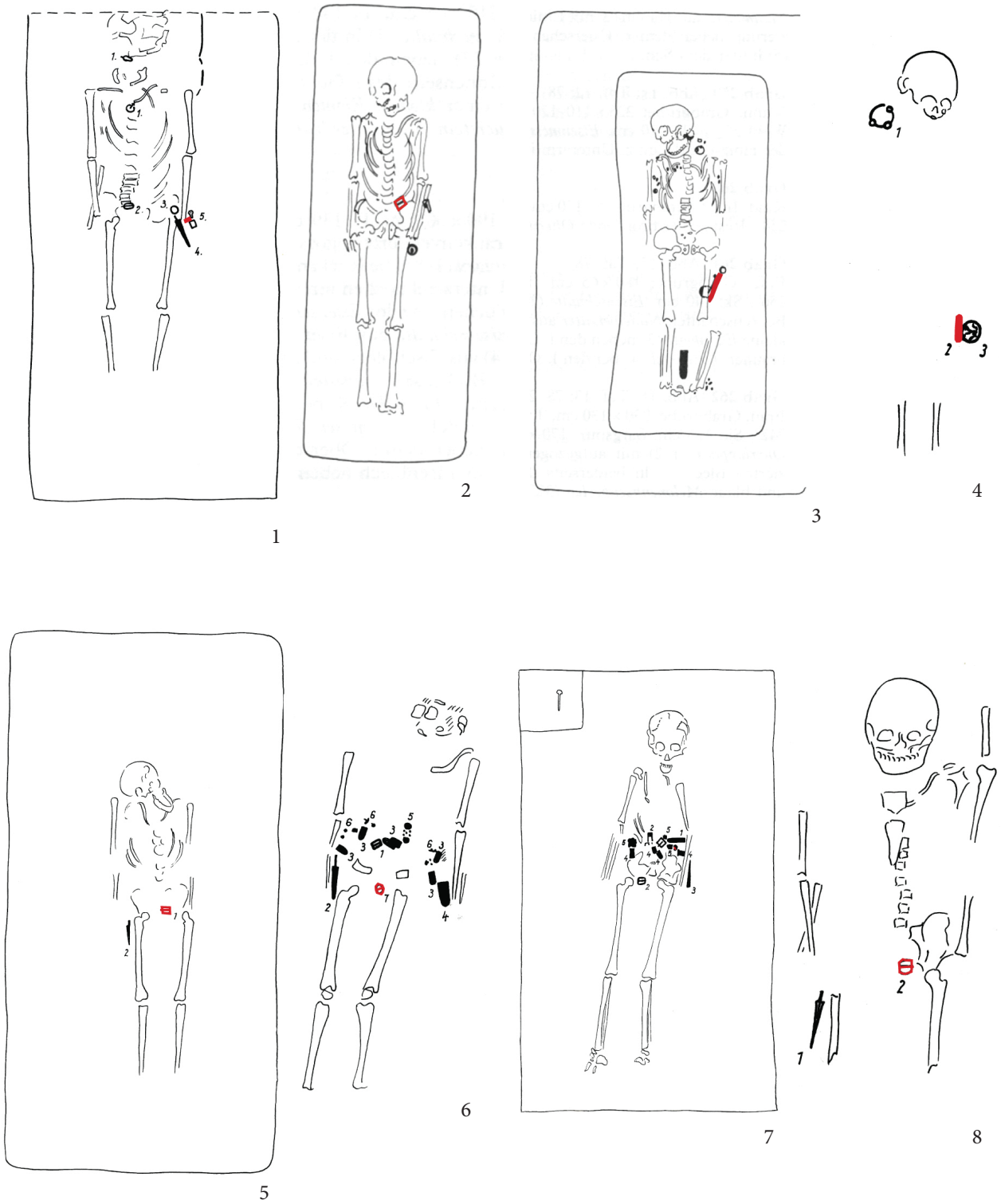

Fig. 23 Grave plans (objects with textile remains marked in red). 1: Grave 241; 2: Grave 261; 3: Grave 262; 4: Grave 266; 5: Grave 297; 6: Grave 300; 7: Grave 388; 8: Grave 402

23. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 241. sír; 2: 261. sír; 3: 262. sír; 4: 266. sír; 5: 297. sír; 6: 300. sír; 7: 388. sír; 8: 402. sír

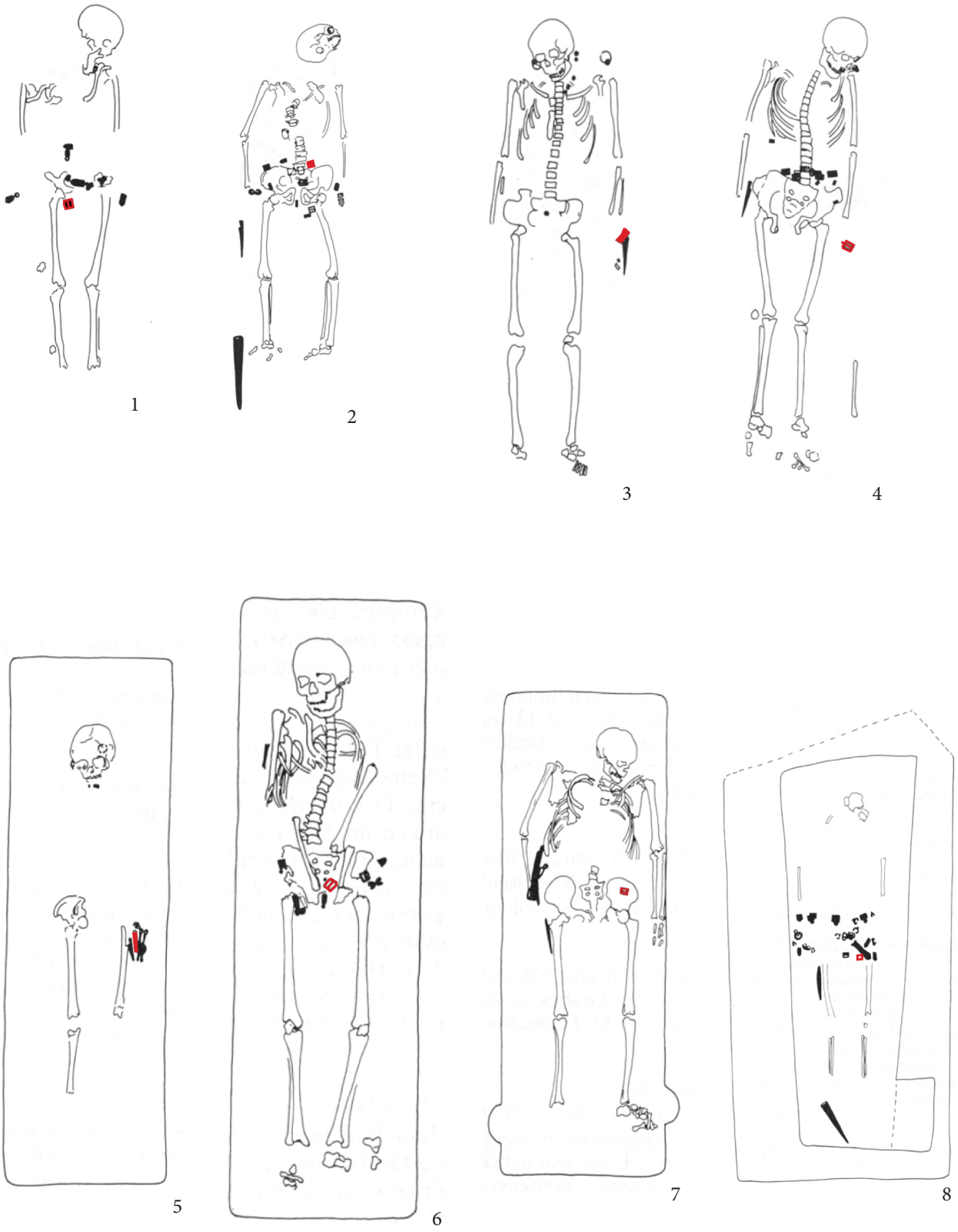

Fig. 24 Grave plans (objects with textile remains marked in red). 1: Grave 453; 2: Grave 456; 3: Grave 464; 4: Grave 482; 5: Grave 498; 6: Grave 509; 7: Grave 531; 8: Grave 537
24. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 453. sír; 2: 456. sír; 3: 464. sír; 4: 482. sír; 5: 498. sír; 6: 509. sír; 7: 531. sír; 8: 537. sír

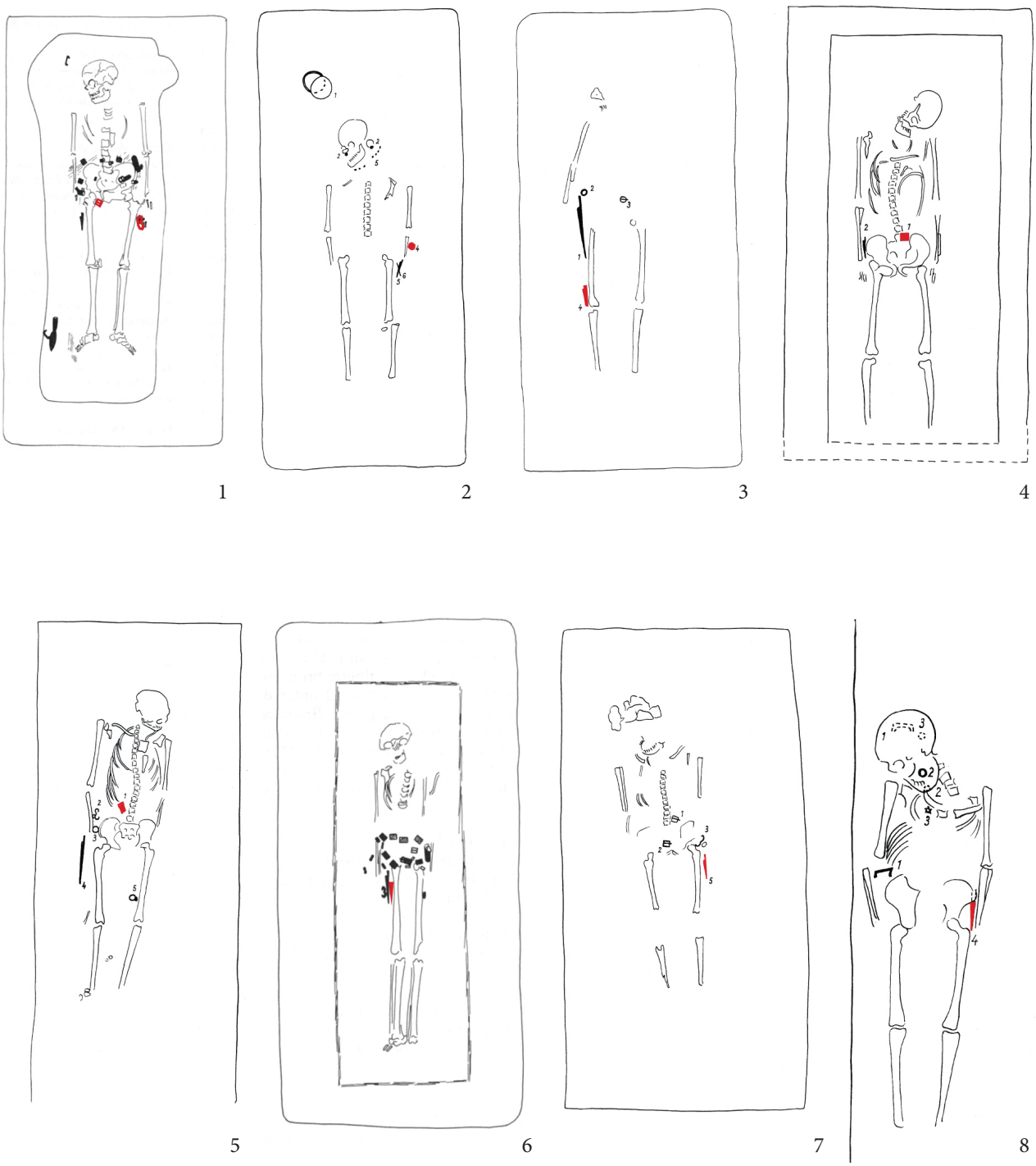

Fig. 25 Grave plans (objects with textile remains marked in red). 1: Grave 577; 2: Grave 588; 3: Grave 601; 4: Grave 614; 5: Grave 620; 6: Grave 680; 7: Grave 699; 8: Grave 707

25. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 577. sír; 2: 588. sír; 3: 601. sír; 4: 614. sír; 5: 620. sír; 6: 680. sír; 7: 699. sír; 8: 707. sír

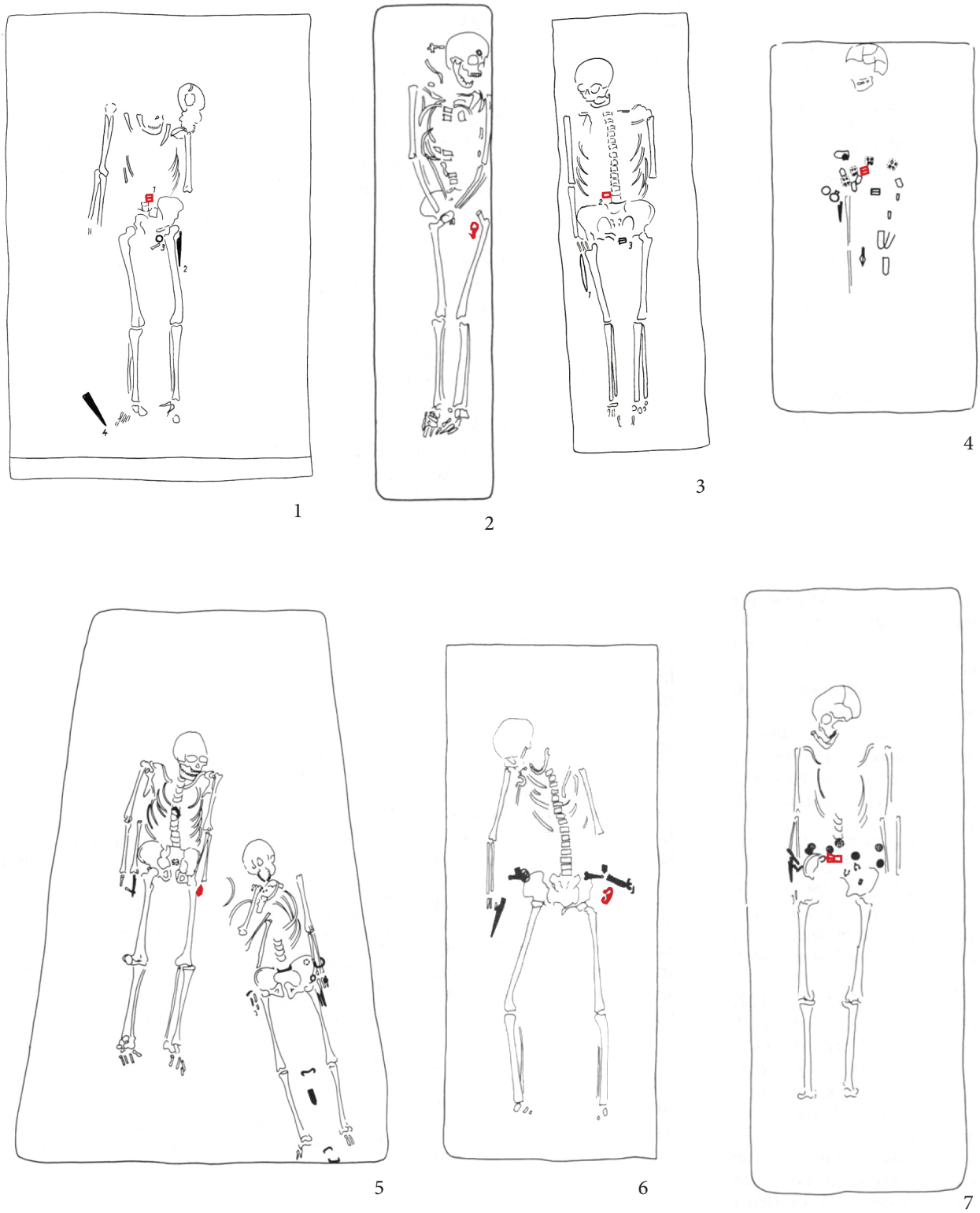

Fig. 26 Grave plans (objects with textile remains marked in red). 1: Grave 706; 2: Grave 737; 3: Grave 772; 4: Grave 776; 5: Grave 785; 6: Grave 787; 7: Grave: 790
26. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 706. sír; 2: 737. sír; 3: 772. sír; 4: 776. sír; 5: 785. sír; 6: 787. sír; 7: 790. sír

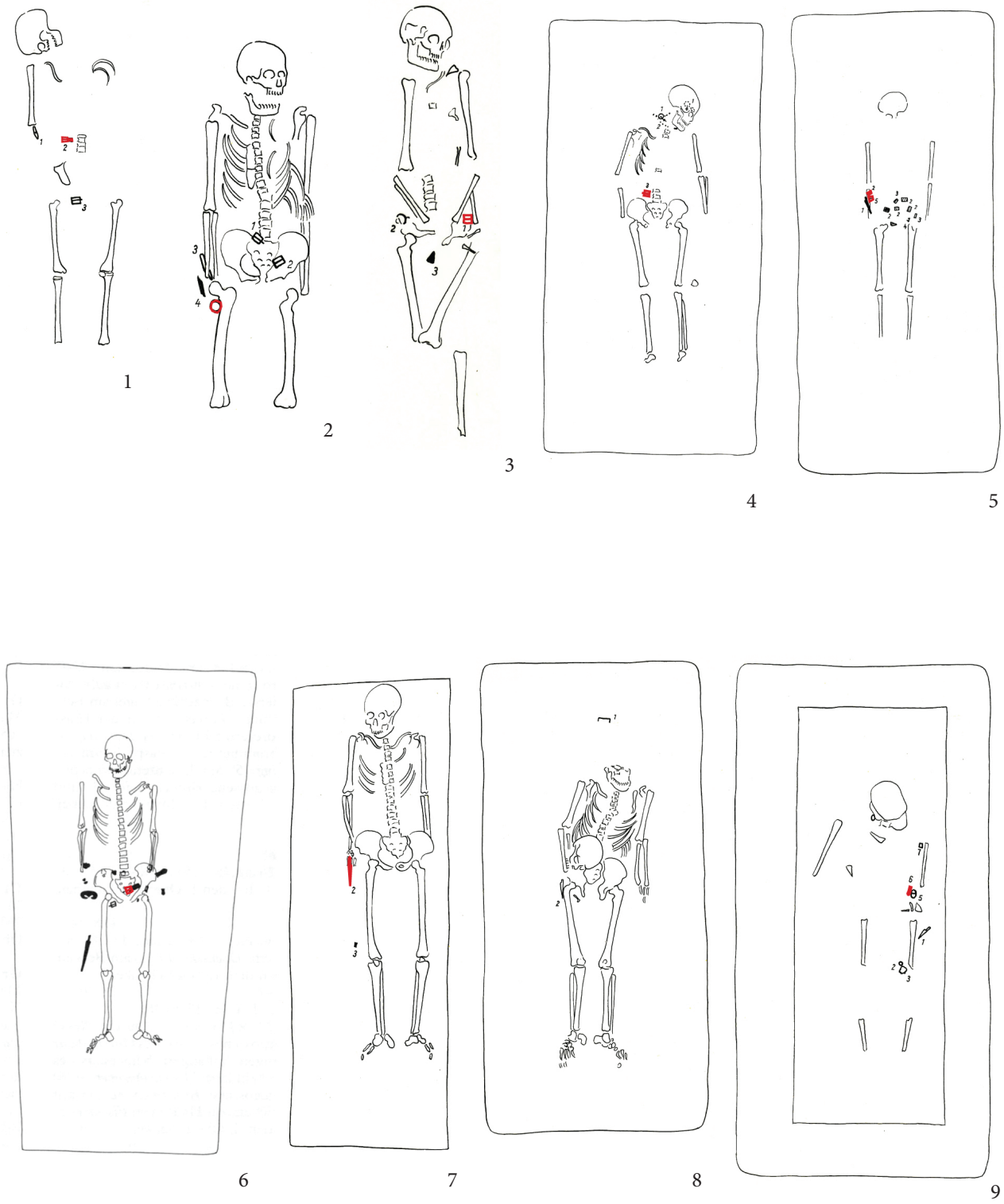

Fig. 27 Grave plans (objects with textile remains marked in red). 1: Grave 811; 2: Grave 818; 3: Grave 824; 4: Grave 835; 5: Grave 869; 6: Grave 871; 7: Grave 872; 8: Grave 896; 9: Grave 911
27. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 811. sír; 2: 818. sír; 3: 824. sír; 4: 835. sír; 5: 869. sír; 6: 871. sír; 7: 872. sír; 8: 896. sír; 9: 911. sír

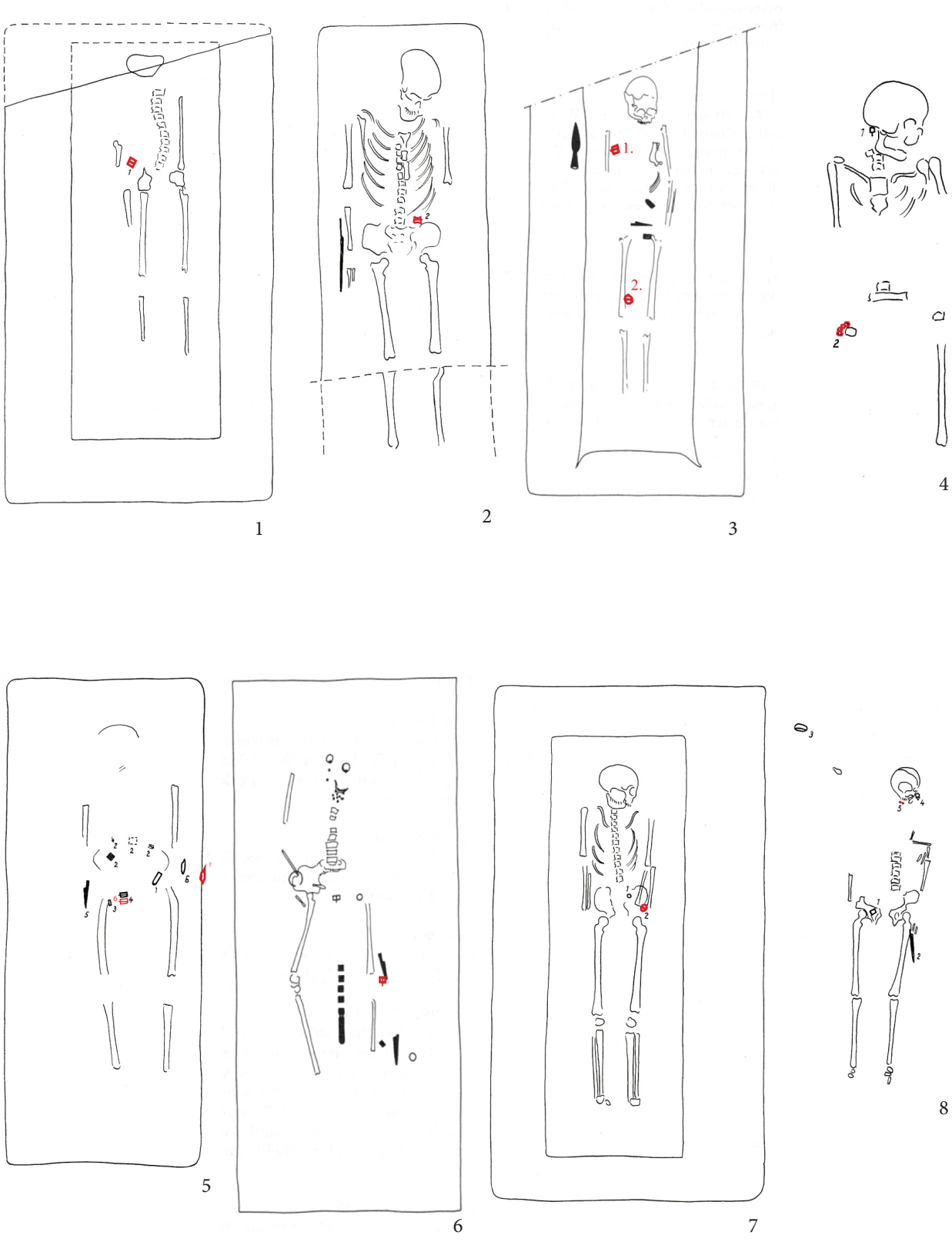

Fig. 28 Grave plans (objects with textile remains marked in red). 1: Grave 930; 2: Grave 931; 3: Grave 937; 4: Grave 948; 5: Grave 967; 6: Grave 974; 7: Grave 1008; 8: Grave 1028
28. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 930. sír; 2: 931. sír; 3: 937. sír; 4: 948. sír; 5: 967. sír; 6: 974. sír; 7: 1008. sír; 8: 1028. sír

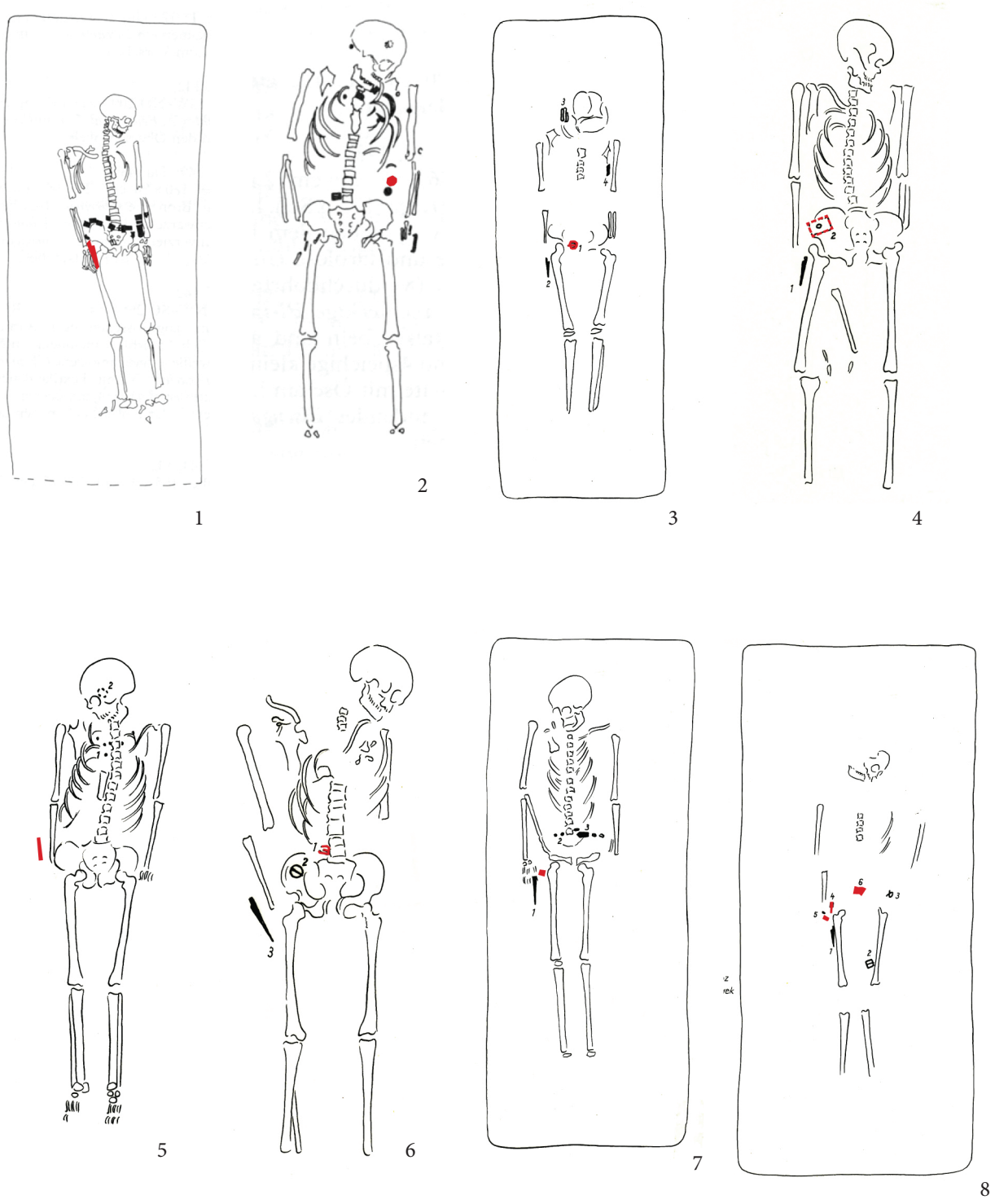

Fig. 29 Grave plans (objects with textile remains marked in red). 1: Grave 1046; 2: Grave 1049; 3: Grave 1065; 4: Grave 1071; 5: Grave 1097; 6: Grave 1111; 7: Grave 1126; 8: Grave 1140
29. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 1046. sír; 1049. sír; 3: 1065. sír; 4: 1071. sír; 5: 1097. sír. 6: 1111. sír; 7: 1126. sír; 8: 1140. sír

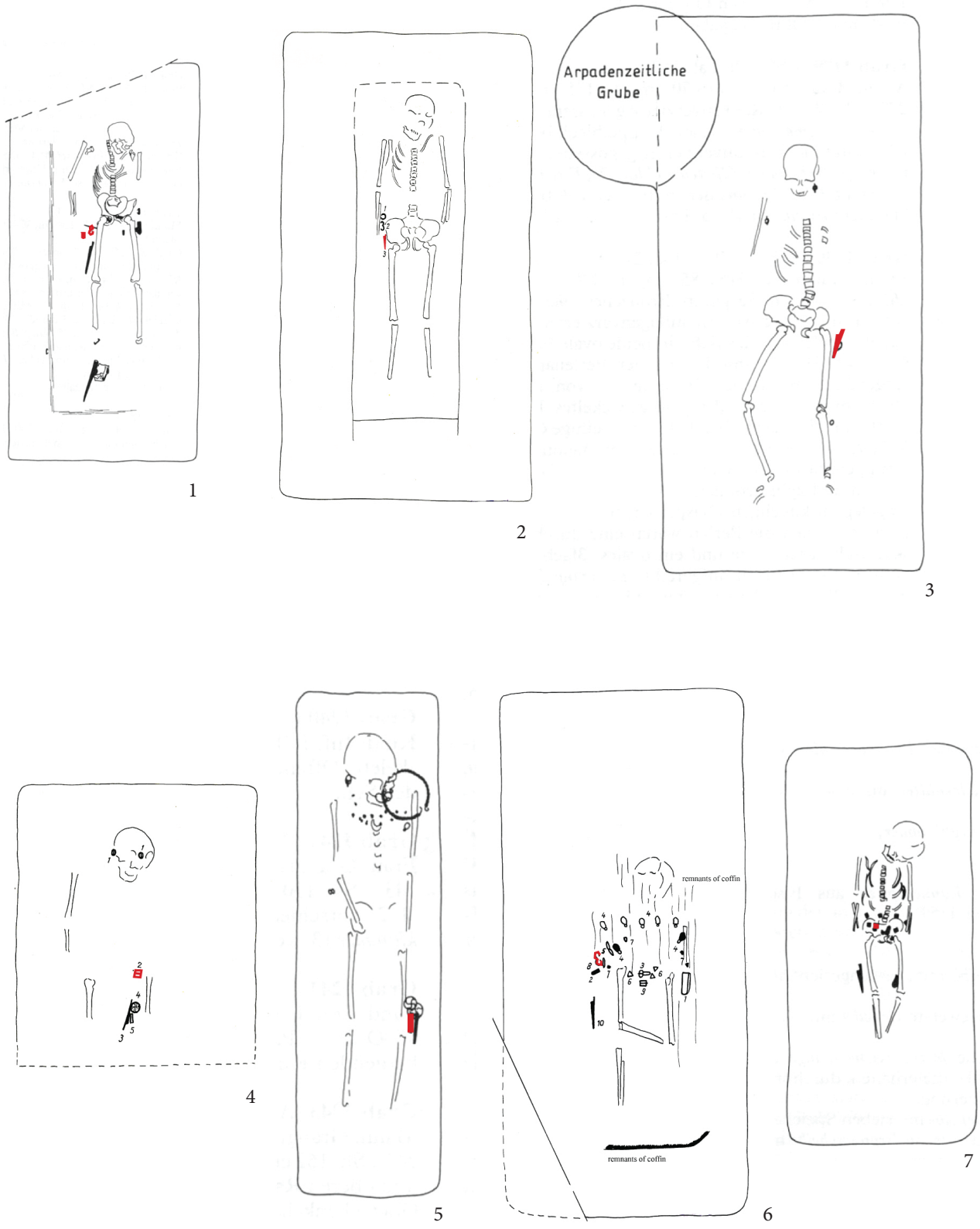

Fig. 30 Grave plans (objects with textile remains marked in red). 1: Grave 1149; 2: Grave 1160; 3: Grave 1174; 4: Grave 1208; 5: Grave 1230; 6: Grave 1268; 7: Grave 1272
30. kép A temető sírjai (vörösen jelölve a textilmaradványos tárgyak). 1: 1149. sír; 2: 1160. sír; 3: 1174. sír; 4: 1208. sír; 5: 1230. sír; 6: 1268. sír; 7: 1272. sír

A TISZAFÜRED-MAJOROSI AVAR TEMETŐ TEXTILMARADVÁNYAI

Összefoglalás

A Kárpát-medencében a szerves anyagok nagyon ritkán kerülnek elő régészeti kontextusból, azonban az ún. pszeudomorf-textilek jobb eséllyel maradnak meg, melyeket a vas- és bronztárgyakból kioldódó fémsók konzerválnak. Ezek vizsgálata nagyfokú precizitást igényel, de állapotuk miatt sokszor nehéz azonosítani a tulajdonságaikat. Sztereomikroszkópos vizsgálattal meghatározható a textiltöredékek fonalainak sodrata, vastagsága, sűrűsége és a szövet kötésszerkezete. Kiváltképp fontos a textilek elhelyezkedése a tárgyon, s a rétegződés, melyet a mikrostratigráfia segítségével lehet vizsgálni. Az egyes textilmaradványokból kinyert adatok, s azok adatbázisba való rendezése révén következtethetünk egy adott kor és szűkebb régió népei által használt szövetek minőségére (akár egyes ruhadarabokhoz köthetően), a készítésének módjára, illetve akár import darabok elkülönítésére.

A jelenlegi gyűjtés és vizsgálat alapján hét szövettípust lehetett megkülönböztetni. A legtöbb textília vascsatokon maradt meg (*1. kép 1*), ezeket pozíciójuknál fogva a felső-, illetve az alsóruházathoz lehet kötni, esetenként feltételezhető a halotti lepel alkalmazása is.

Az 1. csoportba (*2. kép 1; 3–6. kép*) a legnagyobb arányban előforduló tömör, mindkét irányból megegyező fonalvastagságú vászonszövéssel készült textilek sorolhatók (*1. kép 1*). Fonalvastagságuk 0,28 és 1,5 mm között mérhető, fonalsűrűségük pedig centiméterenként 8 és 12 között van.

A 2. csoportot (*2. kép 2; 7–8. kép; 9. kép 1–3*) a különböző fonalvastagságú, vászonkötéssel készült szövetek alkotják. Fonalaik vastagsága 0,27–1,81 mm. Gyakran 8/10, 12/14 vagy 12/16 fonal helyezkedik el egy-egy szálirányban centiméterenként.

A 3. csoportba (*2. kép 4; 9. kép 4–6; 10. kép; 11. kép, 1–3*) a gyér kötéspontokkal rendelkező vászonkötésű szövetek sorolhatók, melyek többféle tárgy felületén is megfigyelhetők voltak. Fonalainak vastagsága 0,36–1,48 mm között mozog. Centiméterenként 8–15 fonal figyelhető meg.

A vászonkötésű, gézszerű textilmaradványok alkotják a 4. csoportot (*2. kép 5; 9. kép 6; 11. kép 4–8; 12. kép 1–4*). Fonalaik vastagsága 0,36–1,09 mm között mérhető, míg fonalsűrűségük centiméterenként 6–14.

Az 5. csoportba az ún. háromdimenziós lineáris szerkezetű textíliák (*2. kép 6; 12. kép 5–6; 13. kép 1–6*) tartoznak. Fonalainak vastagsága 0,35–1,09 mm közötti. Centiméterenként 12–14 fonal figyelhető meg.

A sávolykötés több fajtáját is sikerült elkülöníteni a temetőben. A 6. csoportba (*2. kép 7; 13. kép 7–8; 14. kép*) a lánc-, illetve vetüléksávoly kötések sorolhatók. Fonalaik vastagsága 0,2–1,34 mm. Fonalsűrűségük 12–16 fonal/cm.

A leletanyagban a legattraktívabbnak számító kötésszerkezet a törtgyémántsávoly (*broken diamond twill*), mely a 7. csoportba (*2. kép 8; 15. kép; 16. kép, 1–4*) tartozik. Külleme és Kárpát-medencén kívülről való származása miatt a törtgyémántsávoly magában is magasabb értéket képviselhetett annak ellenére, hogy kevesebb mellékletet tartalmazó sírokban fordult elő. Fonalainak vastagsága 0,29–1,03 mm. Fonalsűrűségük 12–20 fonal/cm között mérhető.

A férfisírokban gyakoribb az 1. csoportba tartozó szövetek előfordulása, míg a női sírokban a 2. csoportba sorolt textiltípusok fordulnak elő többször. A legtöbb textilmaradvány (39 db) az 1. csoportba sorolható (tömör vászonkötés), de a 2. (21 db) és a 3. (18 db) csoportba helyezettek aránya is viszonylag magas (*1. táblázat*). Az 5. (8 db), 6. (8 db) és 7. (10) csoport szövetmaradványai számítanak legritkábbnak ebben a temetőben. Ugyanakkor feltételezhető az Európa-szerte szórványosan előforduló pliszírozott textília viselése is.

A Tiszafüreden megfigyelhető kötésszerkezetek közül a vászonkötés különböző típusai megtalálhatók az ausztriai és más Kárpát-medencei lelőhelyeken is. A törtgyémántsávollyal szőtt és a háromdimenziós lineáris szerkezetű textíliák nem találhatók meg a többi avar kori sírlelet között, előbbinek nagyszámú párhuzamai a mai Észak-, Dél- és Kelet-Franciaországban, Svájc keleti részén, illetve kisebb számban deli részén is megtalálhatóak, tehát az avar környezetben minden bizonnyal import árucikként azonosíthatók. Az ún. „barred damask" típusú szövetek leginkább a Rajnától délre, Dél-Németország és Svájc temetőiben figyelhetők meg. Az elit sírjaiból ismert plisszírozott textíliáka 6–7. század folyamán egy olaszországi és egy nagy-britaniai (Sutton Hoo) példától eltekintve mind Franciaország területeiről ismertek.

Az avar kori textilmaradványok szisztematikus gyűjtése, alapos vizsgálata és egy adatbázis létrehozása fellendítené a kutatást. Adatbázis segítségével sem lehet ruharekonstrukciókat készíteni, azonban

a korban használatos szövéstechnikára, a textil nyersanyagára, s így a ruházat jellegére is fény derülhet. A Kárpát-medence eltérő területeiről származó textíliák módszeres gyűjtésével és alapos vizsgálatával megállapíthatóvá válnak az egyes régiókra és közösségekre jellemző vonások, tehát a tipikus kötéstípus és fonalsodrat, esetleg a használt nyersanyagok, a ruházkodási szokások (pl. felsőruházathoz használt szövetek minősége). Ennek során felmerülhet egyes területek közötti kapcsolat, mely utalhat a belső elosztási rendszerre, s az ebben forgó textiltípusokra. A nemzetközi kutatásba való beemelése révén pedig az import kérdése is mélyebben tanulmányozható, ugyanis a Kárpát-medencére vonatkozóan nincs összefoglaló textiladatbázisunk, mely a nyugat- és észak-európai országokat tekintve rendelkezésünkre áll. A régiók egyes textiljeinek behatóbb elemzése, aprólékos vizsgálata során különválik a háziipari és a szakosodott ipari termék, ami a műhelykörzetek kérdéskörébe vezet.