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Early Iron Age textile tools from the Požega Valley, Croatia

Abstract

This paper presents an overview of textile tools from two Early Iron Age sites in northern Croatia. The results of their analysis outline the current state of research into textile production in the Early Iron Age Požega Valley. A total of about 200 finds from both settlement and funerary contexts provide insights into a diverse range of shapes and sizes of loom weights, spindle whorls and spools. These suggest that the site at Kaptol was a settlement where textiles were produced in large numbers. Diversity among the textile tools suggests that woven textiles came in different sizes and were made from yarns of different qualities, reflecting the creativity and innovation of the Hallstatt world. A fragment of a burned wooden beam with three oblique, oval holes, next to a set of loom weights could be the remains of a loom. Spindle whorls and loom weights also appear as grave goods where they might be gender and status indicators with important symbolic value. They may also be related to different levels of skill and specialisation within the process of textile production. If that is the case, the process of textile production itself had symbolic value in Early Iron Age Croatia.

Keywords: Kaptol, Kagovac, Croatia, Early Iron Age, textile tools, loom weights, spindle whorls, spools

Introduction

Textile production in prehistoric Europe has been widely researched in the past decades (Barber 1991; Gillis and Nosch 2007; Gleba 2008; Andersson Strand 2012; Gleba and Mannering 2012; Andersson Strand & Nosch 2015; Grömer 2016) and has yielded valuable information on various textile uses, its production methods and techniques, context of finds, and last but not least, the identity of textile makers. Nevertheless, the topic of textiles and dress is quite rarely mentioned in Croatian prehistoric archaeology, although certain dress reconstructions (Milićević 1984) and important finds of textile imprints and tools have been discussed, the latter mostly in the light of experimental archaeology (Dizdar 1996; Krmpotić & Vuković Biruš 2009; Grabundžija & Ulanowska 2016; Sekelj Ivančan & Karavidović 2016).

The aim of this article is to provide new insights into Early Iron Age textile production in continental Croatia. It presents finds from two sites in the

Požega Valley in eastern Croatia including the latest finds from the excavation season of 2019. The sample consists mainly of baked clay loom weights and spindle whorls and only one spool. They were discovered either in closed burial contexts or at the settlement (some from systematic excavations and others as surface finds).

According to the current literature, the Early Iron Age in the northern and north-eastern part of Croatia is marked by the Kaptol group, which is in turn, a cultural component of the Hallstatt culture, a widespread Early Iron Age phenomenon (Potrebica 2019, 504). This material culture was named after the site of Kaptol, which is one of the sites discussed in this paper. Added to this sample are the tools from another nearby site (Vetovo-Kagovac). The aim of this paper is to give an overview of the current state of textile research in the Early Iron Age of the Požega Valley based on its textile tools. Different find contexts permit a discussion of both the organisation of textile



production and the potential symbolic significance of textile production tools discovered in graves.

Research history and contexts

The Požega Valley is located in northern Croatia. It is almost completely enclosed by five mountains with the river Orłjava as the only natural southern exit towards to the Sava River valley, and further to the wider area of the Pannonian plain. All the finds analysed here originate from two sites located on the slopes of the Papuk mountain in the north of the Požega Valley. Aside from the strategic geographical position, prehistoric communities often settled in the Požega Valley because of rich natural resources, such as graphite on the mountains of Psunj and Papuk, which was used in pottery production by Iron Age societies (Dizdar & Potrebica 2002, 111-112).

The site of Kaptol has a long tradition of systematic excavations (Potrebica 2013, 69). Fourteen tumuli have been excavated at Čemernica, the southern necropolis, which is dated to the period between Ha C1 and Ha D1 (Potrebica 2019, 497). The excavations lasted from 1965 until 1971 (Vejvoda & Mirnik 1973). Rich finds discovered there caused the culture formerly known as Wies, Wies-Martijanec or Kaptol-Martijanec to be generally recognised as the Kaptol Culture in more recent works (Egg & Kramer 2005, Abb. 2; Potrebica 2019, 488). Textile tools analysed in this paper were discovered in six tumuli at the northern necropolis, located in the immediate vicinity of the hillfort, at the location of Kaptol-Gradca. The necropolis on Gradca has at least of 25 tumuli. Of these, 17 were excavated from 2000 to 2017 and all of them are dated to the period Ha C1 to Ha D1, which is the same era as the burials from the Čemernica necropolis (Potrebica 2019, 497). The systematic excavations at the hillfort started in 2009. Most of the finds belong to Late Hallstatt/Early La Tene chronological phases (probably from Ha D2 to Lt B1). Although culturally this was the final phase of Hallstatt Culture, tumuli were not used at that period and the settlement was fundamentally reorganised. Nevertheless, at least some areas of the settlement were also inhabited in the classical Hallstatt period and therefore contemporary with the mound necropolises (Ha C1-Ha D1) (Potrebica & Mavrović Mokus 2016, 58).

The burial rite on both Kaptol necropolises was very similar. Incinerated human remains in an urn or a container made of organic material were placed in a wooden box or chamber (in a range of sizes) together with a variety of grave goods. In some cases, the wooden chamber was walled with dry-stone construction but all of them were covered with an

earthen mound. Both necropolises are extremely rich and are thought to have been elite burial grounds. Grave goods include weapons (axes, spears and helmets), horse gear, elaborate feasting sets, exquisite ornaments and textile production tools. The quality and well-defined structure of these grave goods as well as the elaborate funerary rituals suggest high status men and women were buried under these mounds (Potrebica 2019, 490-497).

The other, smaller part of the sample presented in this paper originates from the nearby site of Kagovac near Vetovo. The first tumulus excavated at this site, Tumulus 1, contained four spindle whorls. This tumulus is dated to the Ha C1 period, and the burial custom and various grave finds are similar to the ones at the site of Kaptol which is located only 6 km to the west (Potrebica 2019, 500).

The existence of the site of Vetovo-Kagovac was previously known but with the help of light detection and ranging (LiDAR) scanning which was conducted in 2014 as part of the international project *Encounters and Transformations in Iron Age Europe* (ENTRANS), new information was revealed. The LiDAR scan and field surveys revealed that the site itself consists of a fortified hillfort on the Gradac Hill, a necropolis with about 15 tumuli located along the road leading to the settlement from the west, and a necropolis with much smaller tumuli located on the southern slopes of the hillfort (Potrebica 2019, 499). To this date, four tumuli have been excavated on the western and one on the southern necropolis, and only within one of the burial chambers were textile tools found. Several textile tools discovered in the area as well as in the filling of the mounds date back to the Eneolithic, since the Iron Age mounds were erected over the settlement of the Eneolithic Kostolac Culture (Potrebica 2019, 499).

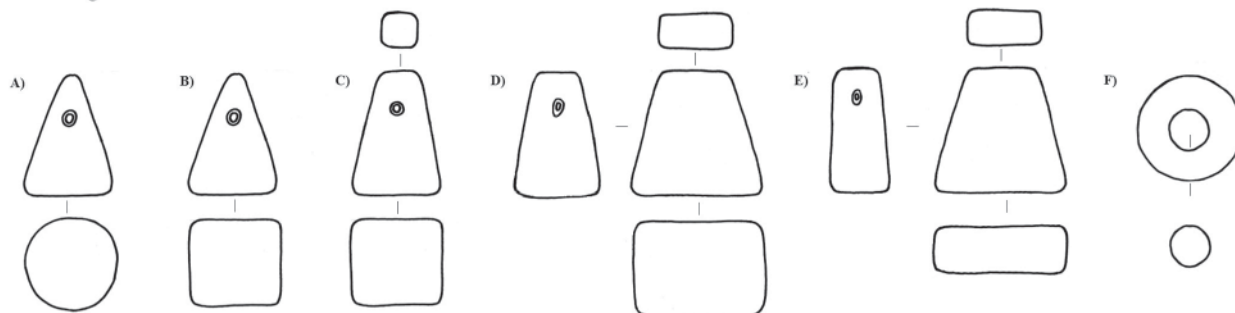
Owing to the composition of the soil, the organic components of textile production tools, such as wooden spindle shafts and distaffs have disintegrated, although the location of a single wooden loom beam from the settlement at Kaptol has been documented (Potrebica & Mavrović Mokus 2016, 58).

Textile tools and methodology

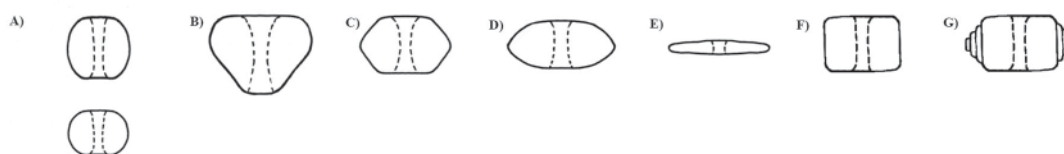
A total of 208 finds of textile production tools were analysed. The sample consists of 81 spindle whorls, 121 loom weights and six potential spools. A total of 202 of the 208 finds originate from the settlement and the necropolis of Kaptol-Gradca. The other are six from the necropolis of Kagovac. Most of the sample is represented by loom weights (58%) and spindle whorls (39%), whereas spools are rare (3%) and their



Loom-weights



Spindle whorls



Spools

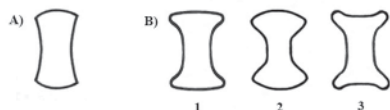


Fig. 1: Typology of textile tools from the sites of Kaptol and Kagovac. Loom weights: a) conical; b) pyramidal; c) truncated pyramidal; d) prismatic trapezoidal; e) flat trapezoidal; and f) ring-shaped. Spindle whorls: a) globular; b) conical; c) biconical; d) lenticular; e) discoid; f) cylindrical; and g) special shape. Spools: a) cylindrical body with widened ends; and b) concave body with i) convex ends; ii) flat ends; and iii) concave ends (Image: Julia Fileš Kramberger)

identification is questionable as most of the finds initially identified as spools are very fragmented. At the site of Kaptol, the material analysed was found in six excavated trenches (Trenches 1 to 7). Although surface finds come from all over the settlement area, the majority is from the location called Lisičje jame (which means fox holes). The finds from burial contexts come from six tumuli (Tumuli 1, 3, 8, 12, 13 and 17) at the necropolis at Gradca. At Kagovac, the textile tools were discovered under Tumuli 1 and 3 at the western necropolis. Nevertheless, the only clear Early Iron Age context can be attributed to the four spindle whorls found inside the burial chamber in Tumulus 1.

All the finds so far are of baked clay, and some have been documented as having signs of secondary burning. Morphological characteristics were recorded for all finds, such as their dimensions, weights (for example, fig. 3, fig. 10 and fig. 13) and shape (fig. 1). For fragmented finds, when it was possible, the total weight was calculated based on the reconstruction of the object's total volume using the percentage of its preserved volume. Height, width and perforation

diameter were documented for spindle whorls, as well as any decorations on their surfaces and possible use-wear traces around and within the perforation. All the dimensions were documented for the complete spindle whorls (100%) or almost complete (90%) and fragmented (50% to 85%), but for the ones which were completely fragmented (0% to 45%), it was impossible to measure all dimensions, and, in some cases, none were documented due to poor preservation. For the loom weights, height, width, thickness and perforation diameter were measured, and use-wear traces and any kind of surface marks were documented as well. All the dimensions were measured for the loom weights that were completely (100%) or almost completely preserved (90%). For the rest, which were either partially fragmented (70% to 85%) or highly fragmented (0% to 65%), it was impossible to measure all the dimensions, and in some cases the fragmentation was so high that none were documented. Finally, in the case of spools, their height and the diameter of both their bases and the middle portion of the body were measured.



Fig. 2: Loom weights from the settlement of Kaptol (Image: Maria Vuković)

Loom weights

The shape of all the loom weights found on the two sites is generally pyramidal (fig. 2), although different categories within this shape have been formed. Therefore, they have been divided into six main categories: a) conical; b) pyramidal; c) truncated pyramidal; d) prismatic trapezoidal; e) flat trapezoidal; and f) ring-shaped (fig. 1).

Most of them were discovered in a settlement context (around 85% of the total). Only a small number of finds was discovered in graves, such as the set consisting of 16 pyramidal and truncated pyramidal loom weights from Tumulus 12 at Kaptol and by a single pyramidal or trapezoidal loom weight in Tumuli 3 and 13 at Kaptol and Tumuli 1 and 3 at Kagovac.

About half of the loom weights in the sample are of the pyramidal and truncated pyramidal type and a little over 40% of the loom weights fall into the categories of the trapezoidal type. Only 3% of the loom weights are conical and the rest, about 2%, were so fragmented that their shape was impossible to define.

A single find that was included in the loom weight group differs from the rest of the sample. It is a ceramic doughnut or ring-shaped object. This type of utensil is usually interpreted either as a cooking ring or a ring-shaped loom weight in the relevant literature (Kneisel & Schaefer-Di Maida 2020, 105-106). It has a diameter of about 8.1 cm, its width is about 3.8 cm and

the diameter of the perforation is between 3.3 cm and 3.6 cm. Its weight is 225 g. The rims of the perforation are slightly worn and rounded and, in some places, additionally flattened. This may be the result of the object being suspended by a loop or thread. There is also a deep horizontal gash visible within the hole which is possibly the result of perforating the clay object and shaping the hole while it was being made. It was likely to have been used on a loom as a weight, and possibly for finer and denser textiles, although this is questionable as it is the only find of its type. It was discovered in a burnt Early Iron Age house in Trench 6. This trench is rich in textile implements, and it is also the place where the potential evidence for a

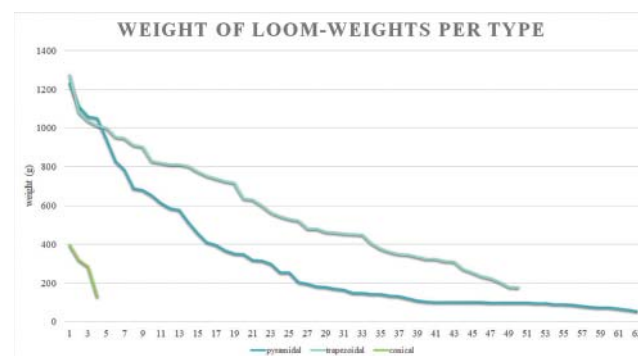


Fig. 3: Visual representation of the difference in weight between different shapes of loom weights (Image: Julia Fileš Kramberger)

loom was found. Therefore, it is quite probable that this object was used in a textile production process. Prismatic and flat trapezoidal weights are bigger and heavier than pyramidal and truncated pyramidal loom weights (fig. 3). They all originate from the settlement at Kaptol, either from systematically excavated trenches or from the location of chance finds. Their weights range from 175 g to 1273 g, and the average trapezoidal loom weight weighs 583 g. The average weight of pyramidal weights is almost half the average weight of the trapezoidal ones, which is about 310 g. It is also noteworthy that the truncated pyramidal loom weights (about 28% of the sample) are on average the lightest, and only five of them weigh more than 400 g, the rest range from about 50 g to 250 g. The average weight of truncated pyramidal loom weights is about 190 g. About 55% of the sample weigh less than 300 g, which is quite small for loom weights. The other 45% range from about 350 g to more than 1,200 g. The dimensions of the loom weights reflect their weights. Overall, the width of the loom weights in the sample is less than the thickness, making the width their functional morphological trait. The width was defined as the maximum size of the loom weight's side with the perforation on the surface. Therefore, depending on the loom weight's shape and desired weight, the height of individual loom weights range from about 6 cm to 14 cm. The ratio between the width and thickness is determined by each loom weight's shape. This ranges from about 3 cm to more than 10 cm. Use-wear traces are commonly documented in the sample and mostly consist of a rounding of the loom weight's perforation rims. Especially striking are the traces of wear present on the topmost part of the hole rim on several loom weights, which confirms they were used for weaving. These traces are the result of damage produced by the loop or cord attaching the threads to the loom weight (Karavidović & Sekelj Ivančan 2018, 5). Some damage and striations around the hole rims might have been created during the production phase of the loom weights.

Marks on loom weights

About 35% of the sample bear marks on their surfaces. This phenomenon is relatively common in the Early Iron Age period in the eastern parts of the Hallstatt Culture, but its purpose has not yet been explained. Most commonly, these marks are lines, crosses, dots or circles on the surfaces (Belanová et al. 2007, 428), and usually on the top surface, but not limited to it (Gleba 2008, 134-135; Belanová Štolcová & Grömer 2010, 16). In some European regions from the Bronze Age onwards, impressions of gems and other objects,

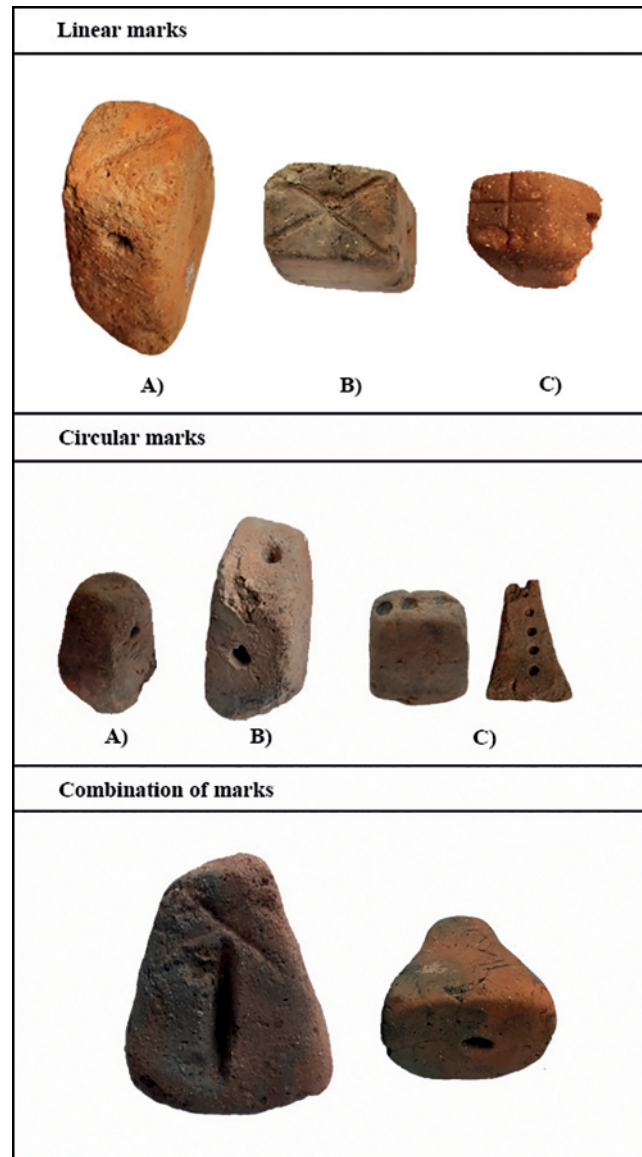


Fig. 4: Examples of marked loom weights from the site of Kaptol. Linear marks: a) single line; b) X-shaped; and c) cross shaped. Circular marks: a) shallow and wide circle impression; b) deep circular impression; and c) multiple circular impressions. Combination of marks: two examples of combined marks (Image: Julia Fileš Kramberger)

and even sigla appear on their surfaces (Rahmstorf 2015, 7).

They might have had a simple, aesthetic value, although more commonly the simpler motifs such as lines, dots or crosses on the top surface have been regarded as symbols of practical use. These marks could have been placed on the surfaces of loom weights as owners' or potters' marks (Rahmstorf 2015, 7), to mark certain groups or sets of weights or even to distinguish some of them from others in terms of weight (Hoffmann



Fig. 5: A loom weight from the hillfort at Kaptol with an X-shaped mark and triple horizontal lines above and below it (Image: Julia Fileš Kramberger)

1964, 20) to help in placing and organising them while warping the loom (Sekelj Ivančan & Karavidović 2016, 188-189) or patterning while weaving (Belanová Štolcová & Grömer 2010, 16).

The marks in the present sample are mostly located on the top surfaces of truncated pyramidal or trapezoidal types of loom weights. On three samples, the marks are present on the sides, and two loom weights have a combination of marks present on more of their surfaces. The only loom weight found inside Tumulus 1 at Kagovac has two parallel linear marks on its base, and, by all accounts, these marks are traces of the loom weight being set on a surface for drying during its production phase.

The shapes of the marks are quite simple, consisting of circular or linear motifs (fig. 4). About 40% of the marked weights have circular or oval indentations. These are mostly simple, wide and shallow and rarely deep indentations on the top surfaces of truncated pyramidal or trapezoidal loom weights, probably made by finger impressions. Three loom weights have much smaller circular marks on them that look as if they were made by a tool with a circular cross-section and are present in a combination of one, three or five such signs either on the top surface or the sides. Sometimes, the circular marks come in groups or combinations with other types of signs, and these are discussed as a separate category. A little over 50% of the marked loom weights have a simple linear symbol, either a single incised or grooved line or two incised or

grooved lines crossed over in the shape of a cross or an X. Of those, crosses and single lines, either horizontal or diagonal, are equally present (on nine loom weights each), and only five loom weights are marked with an X symbol. Only three loom weights bear a combination of marks, in all cases a combination of a circular indentation paired with either a cross or an X and single lines. One of them is a loom weight from Trench 7 at Kaptol and its marks are present on the top and base and on one side. On the top surface, there is a barely visible shallow grooved X-shape, while in the centre of the base, a deep and symmetrical circular impression is visible. On one of the sides, there is a combination of an X-shaped incision beneath with three parallel horizontal lines above it (fig. 5). This is a single such mark present on the loom weights found at Kaptol and it is therefore impossible to compare it with the rest of the sample based on the loom weight's shape or weight. Furthermore, it was found in one of the surface layers of Trench 7 at the Kaptol hillfort and therefore has no clear context within any of the settlement structures.

As all five types of marks on loom weights from Kaptol and Kagovac appear on loom weights of different shapes and sizes and in different locations, it is impossible to link a specific symbol with a specific type of loom weight. The loom weights from Tumulus 12 are an exception because four out of 16 bear marks on their upper surfaces (fig. 6). Three marks were in the shape of a cross, and in one case the cross comes in a combination with a circular impression. The most interesting observation about these finds is that the four marked loom weights were the lightest in the whole set. Their weights range from about 70 g to 80 g, and the rest of the loom weights are between 80 g and 100 g. It is possible that these loom weights were marked precisely because they were the lightest, so the weaver could differentiate them from the rest while warping the loom. Unfortunately, this set of loom weights, although probably belonging to a single loom, was not found *in situ* where it was used for weaving. Instead, it was found inside the burial mound, where it was placed on a pyre and next to the remains of the deceased as a part of the funeral ritual. Therefore, it is impossible to say whether these four marked loom weights had specific spots on the loom when being used.

Specific sets of loom weights

Within the overall sample, two specific groups of finds should be presented in more detail. The first is the set of 16 loom weights found in Tumulus 12. None of the loom weights are higher than 8 cm, their



Fig. 6: Four marked loom weights from the set found in Tumulus 12 at Kaptol (Image: Maria Vuković)

width and depth range from 3 cm to 5 cm and they all weigh from about 70 g to about 100 g. Their average weight is 89.5 g and the sum of their weights is a little under 1.5 kg. They were all found on the remains of the funeral pyre and in the burial chamber, both inside the tumulus, and they have traces of secondary burning. This suggests that these loom weights might have been part of a single loom that was added to the funeral pyre during the cremation of the deceased and afterwards partly placed inside the grave with the remains. Very slight use-wear traces around the perforations suggest that they had been used for a short time before burning on the pyre and deposition inside the burial. Nevertheless, all of the loom weights are preserved very well with no other major traces of use. The *in situ* position of the loom weights did not reflect the position of loom weights on a loom. However, by calculating the total width of all the loom weights and dividing it by two to represent the two layers for creating a basic shed, it can be concluded that the loom might have been about 30 cm to 40 cm in width and could have been used for weaving narrow pieces of textile or bands.

The other set of finds comes from Trench 6 at the settlement of Kaptol, where about 30 loom weights were found in the remains of a house dated to the earlier, Hallstatt horizon (Ha C2-Ha D1). The site was, unfortunately, heavily damaged by erosion. A set of 12 trapezoidal loom weights certainly belonging to the same loom set were found next to the remains of a wooden beam. Ten out of 12 are very well preserved (from about 70% to 100% of their total volume) and weigh from about 780 g to more than 1,200 g. Two of

them 12 weigh less than 300 g. The average weight of these 12 loom weights is about 840 g. Dimensions of sufficiently preserved loom weights were measured and it turned out that their heights are mostly between 12 cm and 14 cm, except for the two smaller ones which are about 8 cm. Their average width is around 6 cm but ranges from 4.3 cm to 7.8 cm. Their thickness, which is, in this case, the non-functional parameter, ranges from 7.3 cm to more than 11 cm, and the average thickness is about 10 cm. There are five loom weights in this set with marks on their surfaces, although no uniformity in the shape of the mark nor their correlation to the weight of the loom weights can be confirmed. This might imply that these signs marked specific spots for certain loom weights on the loom and were not used as a distinctive feature between weight classes.

More than 20 other loom weights were found in the general proximity of the first-mentioned group, although they come from different units and many of their original positions were unfortunately changed owing to those layers being damaged because of erosion. Among those, there are about 12 coming from two very similar and intermixed layers, both close to the one where the previously mentioned set was found. Half of these 12 is trapezoidal and the other half is pyramidal or truncated pyramidal. Their weights range from about 180 g to over 1,000 g but is much less uniform than the weight of the 12 described above. Their average weight is about 600 g, although the general analysis of their weights should be considered with caution, as they are all very fragmented and were only sufficiently preserved to record their weights accurately, while the rest were calculated based using an estimate of their preserved volume. These loom weights might have belonged to the same loom as the previous 12, although based on the clear differences in their morphology and the generally poor state of preservation, they might have simply belonged to the textile production space where they were found. They could have belonged to a completely different loom setup or they might have been stored in this part of the structure as spare loom weights (Karavidović & Sekelj Ivančan 2018, 4).

Spindle whorls

Another group of finds are the spindle whorls (fig. 7). They can be categorised as seven main types: a) globular; b) conical; c) biconical; d) lenticular; e) discoid; f) cylindrical; and g) special shape (fig. 8). Most of the whorls (about 42%) are biconical, followed by globular (21%), lenticular (20%) and conical (11%) whorls. The discoidal whorls are rare and represented by only three finds, while the cylindrical and the



Fig. 7: Spindle whorls from the hillfort of Kaptol (Image: Maria Vuković)



Fig. 8: Special or star-shaped whorl from the hillfort at Kaptol (Image: Julia Fileš Kramberger)

special-shaped whorls are represented by only one example each. The special-shaped spindle whorl (fig. 1: G) is essentially star-shaped, as it has six conical bulges evenly arranged around the whorl (fig. 8). This is the only such find from Early Iron Age Croatia to date, although similar whorls have been found on the nearby Iron Age site of Donja Dolina in northern Bosnia (Truhelka 1914, 98). This spindle whorl shape is not as rare in prehistoric archaeological assemblages as might be expected and, to name a few examples, it is found in the Bronze Age Terramare culture of northern Italy (Sabatini et al. 2018, 374) and at settlements of the Late Bronze and Iron Age Lusatian culture in Poland (Przymorska-Sztuczka 2018, 59), where these and similar shapes of spindle whorls are sometimes described as “horned” (Przymorska-Sztuczka 2018, 59; Taras 2012).

About 10% of the spindle whorls have a so-called “hollow top” (Andersson Strand & Nosch 2015, 148,

fig. 5.1.5), a depression around the perforation on the top surface of the whorl (fig. 9: A), which might have had a practical use in securing the already spun yarn on the spindle (Gleba 2008, 106). About 24% of all the whorls have a particular morphological trait comprised of a ridge around the hole on the lower part of the whorl (fig. 9: B). These two traits were not considered for identifying a special type of whorl, as they are present in various categories. The hollow top is only present in biconical and conical spindle whorls, as five and four pieces respectively. The raised ridge around the perforation on the bottom surface of the whorl is present in several biconical, globular and lenticular types and only one conical spindle whorl. It could have had a practical use too, possibly for securing the whorl on the spindle shaft or maybe even to help insert the spindle in the shed during weaving, if it was being used as a shuttle (Barber 1991, 305). Finally, it should be noted that globular and lenticular whorls



A)



B)

Fig. 9: a) Two spindle whorls with examples of hollow tops from the hillfort at Kaptol; and b) a spindle whorl from Tumulus 17 from Kaptol with a raised ridge around the bottom rim of the perforation (note that the whorl was photographed upside-down) (Image: Julia Fileš Kramberger)

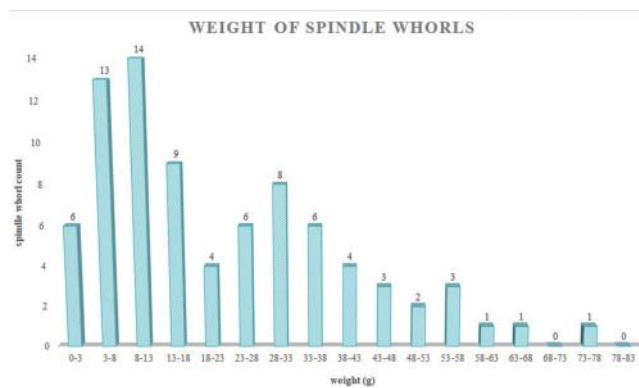


Fig. 10: Visual representation of weight of spindle whorls found at Kaptol and Kagovac (Image: Julia Fileš Kramberger)

were the only types found in a burial context. These types of whorls were also found in the settlement, in addition to the rest of the shapes.

The vast majority of the spindle whorls can be described as very small (less than 10 g), small (10 g to 25 g) or medium-sized (25 g to 50 g) based on their dimensions and weights (fig. 10) and using Mazāre's categorisation (2014, 12). Only about 6% falls into the category of large (50 g to 75 g) and 1% into the category of very large (more than 75 g) spindle whorls. More accurately, only 15 of 81 weigh more than 40 g, which fits well with the notion that in the Early Iron Age spindle whorls usually weighed 10 g to 15 g, and rarely more than 40 g (Grömer 2005, 111).

The overall dimensions of the spindle whorls correlate with their weight. In general, the height of the spindle whorls ranges from about 1 cm to a little more than 3.5 cm, and the average height is about 2.2 cm. The maximum diameter of the spindle whorls ranges from 1.4 cm to a little over 5 cm and the average maximum diameter is about 3.2 cm.

The smallest and lightest spindle whorls, weighing less than 10 g, were also included in the statistics because they are of similar shapes and have similar decorations as the larger ones. It has been proven that whorls as small and light as these could have been used for spinning (Olofsson et al. 2015; Mårtensson et al. 2006) and, in this case, they were usually found as single finds and not in clusters (Gleba 2008, 109). Theoretically, it is possible that some of them, especially the ones lighter than 3 g, could have been used as beads (Mårtensson et al. 2006, 11).

The perforation of a spindle whorl is supposed to be wide enough for attaching it to a spindle shaft and its expected diameter should fall within a range between 0.3 cm and 1 cm (Barber 1991, 52). Within the current

sample, it was possible to measure the perforation diameter for 77 spindle whorls. The results showed that most of the analysed spindle whorls have slightly tapered holes, where the difference between the maximum and minimum diameter usually falls within 0.1 cm, although in rare cases it goes up to 0.3 cm. The measurements of the perforations' diameters range from 0.3 cm to 2.2 cm, with more than half the spindle whorls having a perforation with a diameter between 0.3 cm and 0.7 cm. A total of 18% of the whorls have a perforation diameter of 0.4 cm to 0.5 cm and another 13% have a diameter of 0.3 cm to 0.4 cm. This data coincides with the aforementioned spindle whorl dimensions, where small and medium-sized whorls, paired with small perforations, suggest the spinning of short and fine to medium-fine wool (Barber 1991, 52; Gleba 2008, 108-109). More accurately, the perforation diameter within these ranges belongs to smaller spindle whorls with a maximum diameter of up to 3 cm. Nevertheless, the maximum perforation diameter of about 30% of the spindle whorls is more than 1 cm, and in only two cases range from 1.6 cm to 2.2 cm. Most of these belong to spindle whorls with a maximum width between 3 cm and 5 cm. It is possible that the function of some of these objects could be interpreted as something other than spindle whorls, although their general appearance, dimensions and use-wear traces, where visible, do not differ from spindle whorls with perforations of a smaller diameter. This would imply the use of a sturdier spindle. It was possibly used for spinning longer fibres such as flax or for plying thread.

Decorations on spindle whorls

It is noteworthy that about 35% of the analysed spindle whorls are decorated with incisions, impressions or other techniques in the forms of lines, dots and other geometrical and abstract shapes (fig. 11). Nevertheless, the motifs are so varied that no conclusion related to the distribution of decorated whorls can be made. Sometimes, the surface of the whorls has been badly



Fig. 11: Various examples of decorated spindle whorls from the site of Kaptol (Image: Maria Vuković)



worn out and the decoration is barely visible. The star-shaped spindle whorl is the only one decorated with protrusions on the body of the whorl, while the rest of the whorls are decorated by merely producing shapes on the surface in diverse techniques such as incision, grooving, impression and even cord impression. The patterns include dots and circles, triangles and various lengths of straight or curved lines organised in groups, and sometimes these shapes come in combinations. The decorations are mostly present on the entire surface of the whorl and rarely only on the top surface. At the settlement of Kaptol, the decoration of spindle whorls is extremely varied in pattern and technique, especially in comparison with the ones from the burial contexts both at Kaptol and Kagovac, where whorls are mostly decorated with incised or grooved lines and V-shapes. There are even several spindle whorls with unique decoration patterns, which are not present on any other whorls within the sample. Some of them include combinations and groupings of V-shaped lines and dots, covering the entire surface of the whorl with grooved concentric circles or pierced dots or covering the whorl with deep vertical linear incisions etc. Although two whorls are decorated with cord impressions, the patterns of the impressions are quite different. As the entire sample from this settlement is quite small, it is not unusual that certain decoration patterns are present on only one or two spindle whorls. This does not mean that they are unusual for the Early Iron Age, as similar patterns have been recorded on spindle whorls throughout the Hallstatt region and beyond (Truhelka 1902; Gleirscher 2003, 61, tab. 4; Grömer 2005, 108, fig. 1; Gleba 2008).

One of the spindle whorls (fig. 11: 10), found on the surface at the settlement at Kaptol has been ascribed to the so-called West-Pannonian spindle whorl type (Preložnik 2014, 316). These can be found throughout the vast area from the Danube in the north and east to the Drava in the south. These spindle whorls are grouped into a special variant or type based on their decoration consisting of grooving or incising small lines which create three to six separate sections on the entire or only the upper surface of the whorl. These sections are then filled either with parallel grooved or incised lines or impressed dots. Another specific trait is that these spindle whorls are usually globular, biconical or lenticular in shape and have a raised ridge around the (probably) lower rim of the perforation. Based on dated grave contexts, these spindle whorls were in use in Ha C (eighth and seventh centuries BCE) period (Preložnik 2014).

The spindle whorl in question (fig. 11:10), found at the site of Kaptol, is quite small and weighs only

2 g. Slightly lenticular in shape, it has a raised ridge around one of the rims of the perforation. The upper surface of the whorl is divided into four sections by four double grooved lines which spread radially from the central perforation of the whorl. The sections are filled with small circular impressions and another pair of parallel lines, running vertically up to the main four lines. The lower surface is decorated with similar grooved lines but they are grouped into three separate fields of six up to more than ten parallel lines, and the spaces in between are filled with small circular impressions. While collecting the West Pannonian spindle whorl examples, they were considered to have the ridge around the upper perforation rim, suggesting a “neck” (Preložnik 2014, 312; 314, fig. 3; 315, fig. 4). However, the raised ridge is around the lower rim of the perforation, and it resembles conical spindle whorls with the wider surface at the upper end of the spindle whorl (Andersson Strand & Nosch 2015, 148, fig. 5.1.5). This spindle whorl has been very well preserved and shows almost no use-wear, so it was possibly not used before deposition.

Another similar spindle whorl was found in Trench 6 at the settlement of Kaptol which could also be included in the West Pannonian spindle whorl type. It is lenticular in shape, has a raised ridge around its lower perforation rim and it weighs 8 g. Although the decoration has been slightly smoothed, it is still apparent that the upper surface is divided into five sections by five single grooved lines, and the spaces in between are filled with small dot-like impressions. Most spindle whorls have certain damage traces either on their surfaces or on the rims and inside the holes but sometimes it is hard to distinguish technological from use-wear traces. Many spindle whorls in the present sample show traces of perpendicular or horizontal striations on the rims and within the holes, as well as certain deformations of the hole shape itself. These are all possible traces of piercing or treatment to the surface of the unbaked clay at different stages of the spindle whorls’ drying (Forte & Lemorini 2017, 173). On the other hand, some spindle whorls show clear traces of small spall detachment, polishing and rounding around the rim of the hole which would imply the repeated action of inserting and removing the spindle shaft and even the spindle whorls coming into contact with the spun fibre while spinning (Forte & Lemorini 2017, 174; Forte et al. 2019, 4). Finally, some traces, such as abrasive wear on protruding parts and cracks might be results of the spindle whorls coming into contact with something while being used, stored or dropped, and even through taphonomic processes after deposition (Forte & Lemorini 2017, 174).



Fig. 12: Six objects initially interpreted as pieces of spools, found at the hillfort of Kaptol. The only object identified as a spool is marked f (Image: Julia Fileš Kramberger)

Spools

Initially, six objects from the settlement of Kaptol (fig. 12) were analysed as possible spools. After further examination, it was concluded that only one of them (fig. 12:F) was definitely a spool. Since the other five objects are fragmented, the preserved pieces could constitute between 40% and 70% of complete spools similar in shape to three types defined by Gleba's typology (2008). However, such shapes correspond to ornamental protrusions on handles of Late Hallstatt pottery vessels typical for this area (Balen-Letunić 2004, 267, fig. 16; 310, fig. 27.2). These vessels are quite common for the period of Ha D2 and somewhat later and they usually break at the narrowest point, which is the case here. They could also be central handles of clay lids (Rebay 2006, 112), which are also quite a common type on Kaptol hillfort. A good indicator could be the pottery's quality because, in general, vessels are of much higher quality than lids. Mistaking ornamental protrusions on handles for spools is quite common, so a statistical analysis of the state of fragmentation should be taken into account when analysing textile tools from comparative sites.

The only completely preserved spool has a cylindrical body and slightly widened, flat ends (fig. 1: Spindle whorls A) and is quite roughly shaped. Its height is 2.65 cm, the width of the central part of its body is 2.3 cm, and its flat bases or ends are 2.5 cm wide. It weighs 23 g. Although it was discovered in Trench 6 next to the loom weight set, it is unlikely that it was functional part of it (Gleba 2008, 140; Ræder Knudsen 2012, 259-260), since it is the only find of that kind. The fact that

there are no clear use-wear traces visible on it certainly suggests this, although it is noteworthy that all textile production tools from this context were burned with the house, and their surfaces were heavily damaged.

Discussion

The finds presented here originate from burial (two tumuli at Kagovac and six at Kaptol) and settlement (surface finds and six excavated trenches at Kaptol) contexts. Judging by the distribution of the various tools, it can be determined that in tumuli containing textile tools within the burial chamber, spindle whorls were a norm, while the loom weights present a peculiarity. Nevertheless, in four tumuli there were finds of loom weights outside the burial chamber, mostly fragmented and in the surface layers of the burial mound, which implies that they might have been placed there accidentally while building it. On the other hand, in the settlement context, the ratio of spindle whorls to loom weights cannot be determined with any certainty, as there are very different numbers of textile tools found in various trenches of different size in the settlement location. For now, this reflects the status of the ongoing excavations and is not necessarily an accurate representation of textile production processes within the settlements. Furthermore, although the Kaptol settlement has been investigated to a certain extent, it should be taken into account that the one at Kagovac has not been investigated at all.

Based on the fact that the weight and the dimensions of the loom weights largely influence the final product (Mårtensson et al. 2009), the occurrence of two basic shapes (pyramidal and trapezoidal) and loom weights of generally diverse dimensions, suggest that in the settlement of Kaptol the production of textiles was not standardised. It seems that the trapezoidal weights, which are quite large and heavy but quite narrow, might have served for weaving larger pieces of fabric, possibly using thicker threads. On the other hand, the pyramidal ones, which are generally lighter and smaller, might have served for smaller looms used for weaving dense but lighter and finer fabric, possibly using finer threads. It has been suggested that thread diameter is influenced, among other things, by the weight of the spindle while spinning (Grömer 2005, 109-111). Based on this, it should be noted that spindle whorls in the settlement of Kaptol are very varied in their dimensions. The predominance of whorls under 40 g could suggest intense production of finer threads made of wool, while the presence of larger ones could also imply some coarse thread production, possibly even the spinning of flax and plying. Nevertheless, thread diameter is not in direct correlation only with

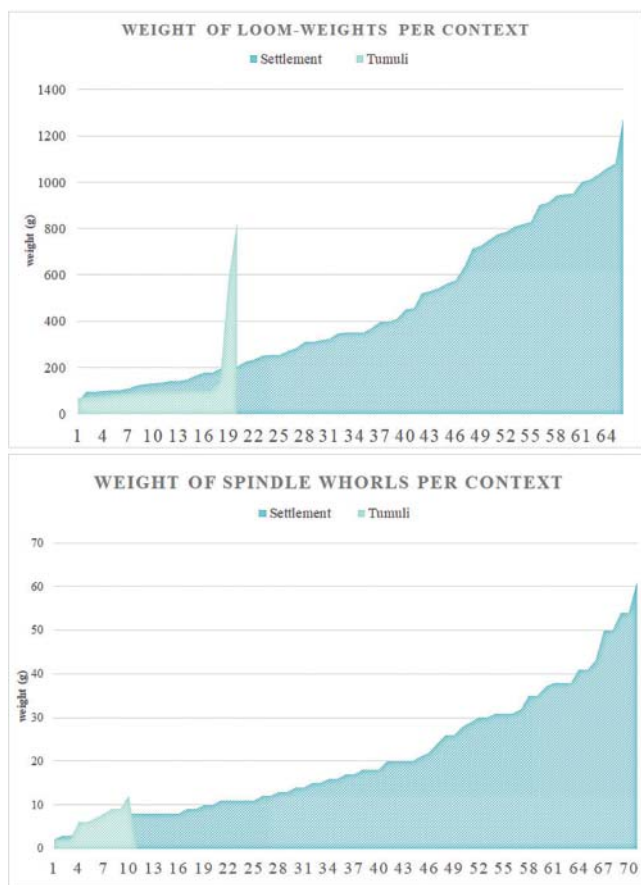


Fig. 13: Comparison of the presence of small spindle whorls and loom weights in a funerary context with finds at the settlement (Image: Julia Fileš Kramberger)

the choice of the spindle whorl based on its weight, but is a result of a combination of factors, such as the fibre material, the moment of inertia of the spindle and even the human factor of the spinner (Kania 2013, 13). Given the notion that thickness and quality of thread may not be influenced by the spindle itself at all (Kania 2013, 27), caution is advised when interpreting the possible outcome of spinning based only on spindle whorls from the archaeological record.

When comparing dimensions of loom weights and spindle whorls in the settlement and burial mounds, it should be stressed that both types of tools are represented by samples which are considered small (fig. 13). The loom weights from Tumulus 12 at Kaptol all weigh under 100 g. Even though the loom weights in Tumulus 12 are especially small and that this set might have been prepared only for funerary purposes, such loom weights are not uncommon throughout the settlement, which would imply that the production of fine fabrics on small looms was an activity within this community.

A similar situation can be observed in the case of spindle whorls, where only the ones falling into the category of very small and small whorls were added to graves. Such spindle whorls are present in large quantities in the settlement too, which leads to the conclusion that those smallest spindle whorls added to graves were not necessarily produced for the funeral but were carefully selected from the assemblage used for spinning in the settlement. The selection of the smallest whorls as burial goods may even be based on their potential symbolic significance – these being the ones used in producing the finest and most delicate threads.

The settlement context of textile tool finds from the sample analysed here suggests that textile production in the Early Iron Age of the Požega Valley area was a common activity. Moreover, based on the fact that these implements were found throughout the settlement of Kaptol and in various possible structures, it can be argued that textile production was an activity carried out on the level of household industry with possible attached specialist production (Andersson Strand 2009, 3; Grömer 2016, 280-281), which does not exclude the possibility of the existence of a more specialised workshop somewhere in the settlement. Nevertheless, as the trenches in the settlement of Kaptol were mostly situated on the slopes of the hill and the material has eroded, specific and closed contexts with textile tools have not been defined yet (Potrebica 2019, 498).

As spinning is a dynamic activity due to the spindle and distaff being light and mobile, the spinners could have moved about freely while spinning thread (Grömer 2005, 109). Therefore, the spots where the spindle whorls are found today reflect the places where they might have been purposefully or accidentally left during spinning. These could have been within or outside certain settlement structures but also in the neighbouring area. This is why spindle whorls are quite common finds within the Iron Age settlement of Kaptol within relatively well defined structures and also in unclear contexts.

On the other hand, the loom itself is a large and heavy device, usually leaning on a wall inside a house, and is therefore a construction not easily moved once it has been set up for weaving. That is why weaving is a static activity, which does not allow the weaver to move about carrying their work with them, which in turn, results in loom weights usually being found in the place where they were last used on a loom, or possibly where they might have been stored (Grömer 2016, 282). Although the tools for spinning and weaving are completely different and even though these two stages of textile production are not mutually dependent,



Fig. 14: The *in situ* find of a wooden loom beam at the settlement of Kaptol (Image: Maria Vuković and Julia Fileš Kramberger)

they belong to the same production process and it is therefore believed that these two operations within textile production were mostly carried out together simultaneously (Gleba 2009, 72). This may be why many spindle whorls at the settlement of Kaptol are found close to larger quantities of loom weights, where they might have been used in specially designated structures or rooms for textile production, particularly in the case of Trench 6, where there is a possible part of a loom found *in situ*.

Trench 6 is situated on the southern edge of the settlement. In terms of chronology, stratigraphic units excavated there belonged to two basic horizons: a later one, dated to the Late Hallstatt (Ha D2 to Lt B1) (late sixth to fourth century BCE); and an older one possibly dating to the Ha C2-Ha D1 period and contemporary to the tumuli burials (Potrebica & Mavrović Mokos 2016, 58). Parts of a burned house damaged by erosion were found in this older horizon. Around 30 loom weights in total were discovered within the house, scattered in a few groups, with a set of them found next to the burned wooden beam with three oval, oblique perforations (Potrebica 2019, 498). This could

be interpreted as the wooden remains of an upright loom with visible holes for heddle rod supports (fig. 14). Owing to erosion, the loom was damaged and about 30 loom weights found on the surface of the house remains come from groups divided into several stratigraphic units. Based on the results of the analysis of these loom weights discussed earlier, it could be proposed that a larger fabric was woven on this loom and that it was possibly either made of fine, densely packed threads or a sparser fabric made of coarser threads. Based on the finds of several lighter loom weights within the set, it could be argued that either not all of these loom weights belonged to the same loom or that the loom setup consisted of specifically grouped or paired loom weights, to compensate for the difference in weight (Sekelj Ivančan & Karavidović 2016, 199-200).

Textile tools from burial contexts

The grave context of this type of finds, which comprises about 15% of the whole sample, gives them a completely different symbolic dimension. It has been argued that throughout prehistory and onwards,



textile production was a female activity (Barber 1991, 283-298; Rebay 2006; Gleba 2009; Sofroniew 2011; García-Ventura 2014; etc) and that textile tools found in graves indicate that the deceased buried there were women (Barber 1991, 289; Gleba 2009, 69; Grömer 2013, 39; Rebay 2006, 192; etc). It is indeed confirmed by the fact that textile implements have been found mostly in female graves, with some rare exceptions (Ramsel 2002, 90; Grömer 2013, 40; Bröns 2013, 57). Traditionally, grave chambers featuring weapons are interpreted as male and those featuring textile tools as female (Gleba 2009, 69).

Further attention should be given to the different number and type of textile tools discovered in burials, since there is possibility that the number of textile tools implies the range of specialisation in the textile production process. It is possible that only one spindle whorl in a grave marks the deceased as female (Gleba 2013, 9; Grömer 2013, 32) and a larger number of spindle whorls, especially if found in combination with loom weights, spools or distaffs, might indicate a higher level of skill and specialisation of the deceased in this profession (Gleba 2013, 9; Grömer 2016, 272). This information is crucial for examining the textile tool assemblages from Tumuli 1, 8, 12 and 17 at Kaptol and Tumulus 1 at Kagovac. Two to four spindle whorls within the burial chambers might indicate that the women buried in these tumuli were extremely skilled spinners. The addition of a loom weight set to one spindle in Tumulus 12 implies that the deceased was a skilled weaver and spinner or was possibly highly visible within the textile production process to the community (Gleba 2009).

As the tumuli necropolises of both Kaptol and Kagovac are essentially graveyards of the elite, it is safe to assume that all the individuals buried there (including women) were of the highest social ranks. Two spindle whorls in addition to many pottery fragments were found in Tumulus 8, representing the lowest rate of finds which might be due to its partial devastation before excavation (Potrebica 2007, 87). The spindle whorls are both lighter than 10 g and globular in shape, while the larger one also has a raised ridge around the bottom rim and is decorated with incisions (fig. 15: 2). The smaller one weighs less than 2 g and might also be a bead, even though it is unlikely as there was only one like it in the burial. Tumulus 1 contained large quantities of pottery, a bronze fibula, several iron objects (among them an iron trunnion axe), as well as two spindle whorls (Potrebica 2011, 3). Both are small, and while the smaller one is conical, the larger one is globular or almost lenticular with a raised ridge around the lower perforation rim. In

Tumulus 17, which also yielded only two ceramic vessels and some metal fragments, three small spindle whorls were found. They all have raised ridges around the lower perforation rims. One is essentially globular in shape, while the other two are lenticular with barely visible vertical grooves (fig. 15: 4). On the other hand, the grave with the largest number of grave goods at the necropolis of Kaptol, Tumulus 12 (fig. 15: 3), had one very small spindle whorl and 16 loom weights together with pottery and metal fragments, a wooden button and various bone pieces probably linked to the funeral attire of the deceased (Potrebica 2019, 495-406). In Tumuli 3 and 13 at Kaptol, the single small loom weights were found in the surface layers of the earthen mound. Apart from these loom weights, these tumuli did not have any particular finds inside the burial that would describe them as typically male or female (Potrebica 2013, 106). It is uncertain whether these loom weights marked the deceased as being female as they were found in surface layers and in no clear context, and thus might not be symbolically connected with the burial but were accidentally thrown in while constructing the mound.

Grave goods under Tumulus 1 at Kagovac (dated to Ha C1) included a large feasting set and a number of other Hallstatt pottery vessels. A bowl with the remains of the deceased was surrounded by seven bronze fibulae (probably holding together original wrapping of the urn). The bowl probably fell from

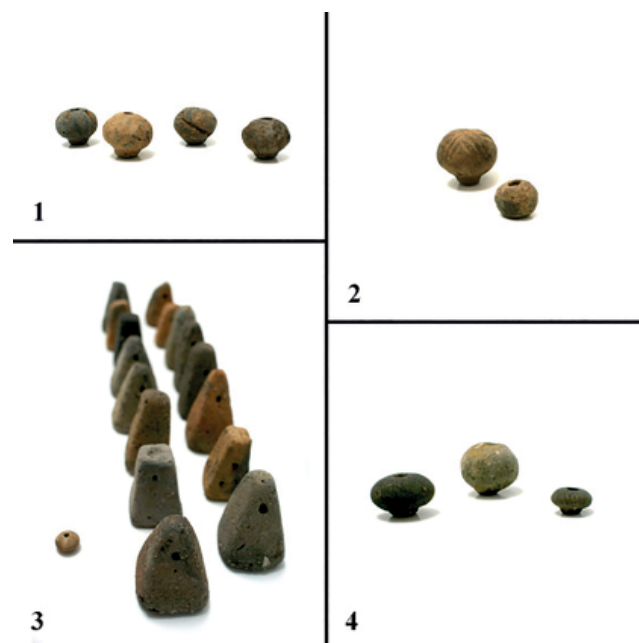


Fig. 15: Examples of textile tool sets from within burial chambers at Tumulus 1 at Kagovac (1) and Tumuli 8 (2), 12 (3) and 17 (4) at Kaptol (Image: Julia Fileš Kramberger)



some kind of organic pedestal and was discovered upside down. Four almost identical spindle whorls were probably placed over the burned bones since they were found under and just beside the upturned urn (Potrebica 2019, 499). Their shapes are generally globular with a raised ridge around the lower rim of the perforation and they all weigh between 6 g and 9 g (fig. 15: 1). They have traces of secondary burning, which suggests they were burned on the pyre with the body of the deceased and replaced next to the urn during the burial. Very slight traces of a rounded and flattened rim of the perforation are visible on all four spindle whorls, so it should be assumed that they were used for spinning prior to the burial. It should also be noted that they are all slightly damaged and deformed due to secondary burning, so the rounding and flattening of the surface might have been partly obscured by the deformation. All four were decorated with vertical or V-shaped grooves but, on some of them, they have unfortunately been rendered almost invisible by use, fire or taphonomic processes. They were found *in situ* next to the upturned urn. The four almost identical spindle whorls possibly belonged to a personal set of the deceased, which could have served for storing yarn. During spinning, the already full spindles could have been replaced by new ones and used as shuttles for weaving without the need to unwind the yarn to be able to continue spinning (Barber 1991, 305; Gleba 2008, 140).

In addition to the spindle whorls, a large pyramidal loom weight was found inside the stone structure of the same burial chamber. This loom weight probably did not form a part of the intentionally contributed grave goods but was possibly placed in the stone structure as part of the building material, originally coming from the earlier Eneolithic layers in the surrounding area. A similar conclusion was reached concerning a loom weight found in Tumulus 3 at the same site. There, a very fragmented piece of a large loom weight of a basically pyramidal shape was found in the bottom-most layers of the tumulus. More accurately, it was found on the periphery of the earthen mound of the tumulus, well outside of the confines of the Iron Age wooden burial chamber and on the surface of an Eneolithic settlement layer on which the tumulus was originally built. Although the loom weight was found while investigating the tumulus, stratigraphically it did not belong to the burial itself. The two loom weights found in Tumuli 1 and 3 at Kagovac are essentially similar, pyramidal and medium-sized to large, weighing more than 500 g.

Unfortunately, the cremated human remains from the tumuli on Kaptol and Kagovac are extremely

fragmented, in some cases almost pulverised, and so far have received only preliminary anthropological analysis. However, it is interesting to note that five of the tumuli regarded as female graves also contain textile tools. Therefore, textile tools could have a gender-related connotation. The discord between relatively plain and simple spindle whorls in those graves and exquisite grave goods apparently supports this possibility. However, the loom weights are a completely different matter since those have been added to spindle whorls in one single grave – a likely female grave with the largest quantity of prestigious grave goods at the necropolis.

For now, it can be proposed that the individuals in Tumuli 1, 8, 12 and 17 at Kaptol and Tumulus 1 at Kagovac were women highly skilled in textile production and revered for it within the community. The presence of other, more prestigious goods, specifically in Tumulus 12 (Potrebica 2013, 73) at Kaptol-Gradca and Tumulus 1 at Vetovo-Kagovac (Potrebica 2019, 499), as well as addition of a weapon (iron trunnion axe) in Tumulus 1 at Kaptol-Gradca (Potrebica 2013, 107), suggest these women had high status within the community which was not directly related to their skills as textile makers. As suggested before, this could be more than just a symbolic representation in the funerary practice, but could even reflect some aspects of everyday life (Gleba 2009, 76). In a simple way, this could be described as: spindle whorls mark gender, while loom weights mark status. In the case of Kaptol (based on current research), this might suggest that organised textile production took place within the households of the elite rather than the ordinary people, which is common in many societies (Costin 2013, 192). Further studies on this matter are necessary before coming to any certain conclusions.

Conclusion

The purpose of the general overview of textile tool finds from these two sites is to present the current state of research into textile production of the Early Iron Age Požega Valley and to offer some issues for further investigation and possible future comparative studies. The specific position of the Požega Valley makes it potentially an ideal area to study textile production processes. It is a geographically closed area but still large enough to give statistically relevant results and models describing Early Iron Age textile production. On the other hand, the Požega Valley is located at the crossroads of three large cultural zones of Early Iron Age Europe: the eastern Alps to the west, the central Danube region to the east and the Balkans to the south (Potrebica & Rakvin 2019, 56). This makes it an



extremely important point in the long-distance as well as regional communication network which is reflected in abundant archaeological material. Therefore, it could also reveal communication threads related to textile products, technological traditions, and textile production tools within and far beyond the valley. Based on the results presented here, it can be summarised that the site of Kaptol might have been a settlement where textiles were produced within households. The diversity of shapes and sizes of loom weights and spindle whorls suggests that a variety of types and sizes of textiles from different yarn qualities were produced in the settlement. Thanks to a find of a partially preserved loom with a loom weight set and the remains of a wooden beam at the settlement, there is now a much more in-depth view into the textile production processes of the site. Further intensive field investigation might uncover textile production spaces and their organisation. In addition, the presence of textile tools finds in burial contexts, including richly equipped tumuli, suggests that in the Early Iron Age in this area of Croatia the process of textile production had symbolic connotations. It was possibly not only a profession or everyday activity but also a symbol of the female gender. The graves of Kaptol and Kagovac may themselves be a reflection of the social roles and status of certain women within the community. These two sites and their assemblage of textile tools are a perfect starting point for further research into the dynamics of textile production of the Early Iron Age in this part of central Europe and with it the distribution of textile craft and its products through a regional and possibly even wider communication network.

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