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# Use of Colours in the Latvian Archaeological Textiles

## **Abstract**

*The article contains a report of a research project on the colours used in the archaeological textiles of the 3rd-14th centuries AD in the areas of Latvia inhabited by the Baltic population. It concludes that dark blue was the most popular colour of the garments found in the burials of the wealthy Baltic people. Blue and brown single yarns have been detected in the analysed fabrics, and blue, red, and yellow plied yarns have been distinguished in the decorations of the dress. Red and yellow were more frequently observed in female dress. Such a colour scheme seems to have been quite popular in the Baltic-inhabited areas of the Latvian territory in the 3rd-14th centuries AD.*

**Keywords:** *Baltic, Latvia, archaeological textiles, colour, blue, brown, red, yellow.*

## **Introduction**

This article represents one part of the author's doctoral thesis that analyses the use of colours in Latvian textiles from the 3rd-14th centuries AD. This article can also be looked upon as a continuation of the previously published introduction to Latvian archaeological textiles (Davidson and Pigozne 2010).

## **Context**

Results presented here are from a research project that was carried out at the National History Museum of Latvia in 2008 and 2009. All the collected data on the use of colours come from the textiles that are stored at the National History Museum of Latvia in Riga, Archives of the Archaeology Department, where majority of all the Latvian archaeological collections are kept. The analysed textiles come from burials, some stray finds, most of which are from burial grounds, and one hoard.

The total number of textile fragments that are to be found in the Latvian archaeological material is unknown. Mostly this is because the majority of archaeologists in Latvia have not been particularly interested in researching textiles. Textiles are such fragile artefacts that many of the excavated fragments have never been given an accession number and have often not been mentioned in the documentation of excavations. Another complication involves cleaning,

conservation and storage of the textile fragments once they have already arrived at the museum. Restricted budgets, other priorities and sometimes lack of knowledge (especially in the Soviet times) have led to a situation that many of the textile remains have never been cleaned, are not properly conserved and stored, so further degradation takes place.

Having said that, it is important to emphasize that Latvia possesses a great number of well-preserved archaeological textile remains, primarily due to two reasons: the type of soil favouring textile preservation, especially in the eastern part of the country, and the tradition of the 7th-13th century to use bronze jewellery and bronze decorations woven directly into woolen fabrics. Bronze functions as a preservative and so many textile remains have survived remarkably well.

A couple of other general aspects have to be mentioned with regard to textile finds in Latvia. If the buried person has many belongings in the burial, particularly pieces of bronze jewellery, it is more likely that textile fragments have survived. This leads to a disproportionably large number of textiles from the graves of the wealthier people and practically no record of the clothing remains of the poor. Moreover, as the bronze decorations that have been woven into the woolen fabrics are mostly used in particular garments, fragments of these garments constitute



the majority of the textile finds. Therefore the largest quantity of the better preserved textile remains that can be linked to specific garments are as follows: women's shawls (*villaine*) and head ornaments (*vainags*), men's capes, arm bands and leg wraps. There is no convincing proof of any textile fragments having belonged to women's skirts or men's trousers. This is mostly because the placement of the preserving bronze jewellery and decorations have normally been in the area between the deceased person's head and hips. Accordingly, textile remains are usually from this part of the burial. At the same time, analysing the colour of the women's shawls that constitute the largest number of the archaeological textile material, would repeatedly lead to the same result of blue. The same can be said regarding men's arm bands that were decorated with bronze rings. Similarly women's head decorations usually show the use of a red ground. This is why more samples of other garments have been chosen for the analysis, e.g. textile fragments that might have belonged to men's coats and caps. A number of textile fragments that can not be identified as parts of particular garments have been analysed for the same reason.

Finally, it is necessary to address the problem that probably the great majority of the textiles that have been excavated from the burials might belong to festive/ceremonial dress and not everyday dress. Taking into account that most of the finds are from the burials of the wealthier people, there still are indications that the excavated garments had been used prior to the burial ceremony. There are at least two finds of unravelled and coarsely mended tablet-woven bands attached to the edges of women's shawls (Zarina 1970, 82, table 13, no. 4, 11). The mended parts correspond to the placement of fibula used for holding both ends of the shawl together. Another example shows that "buttonholes" were sometimes sewn in the tablet-woven bands to avoid unravelling of them when a fibula would hold a shawl together (Zarina 1970, 88). This suggests that the shawls were used many times during the lifetime. Another source of information regarding clothing not used in burials comes from the Tiras Bog hoard of textile fragments from at least 15 different garments of men's clothing (Zeiere 2008, 130). Several of these garments had been mended e.g. leg wraps. Accordingly, the appearance of the hoarded textiles, as well as the craft skills needed for producing them are similar to those garments found in the contemporaneous burials.

#### **Earlier research and methods of detecting the colours**

So far distinguishing colours has not been the main interest even to those archaeologists who have done

research on the archaeological textiles (for more information on general research on Latvian textiles, see Davidson and Pigozne 2010, 5-31). The first publication where colours were mentioned was by Ernsts Vale in 1928 (Wahle 1928, part 2). He noted that the colour of some 3rd-4th century AD textile fragments from Rucavas Mazkatuzi burial ground could possibly have been natural grey. Julijs Auskaps spotted wood blue colour of a shawl from Stamerienas Annasmuiza burial ground (Auskaps 1929, 32). Valdemars Ginters (Dzervitis and Ginters 1936, 26-54) described the archaeological evidence of textile remains and wrote that the main colours of the fabrics were blue, brown, and natural grey; the colours of the ornaments: blue, yellow, red, and green. However, Ginters admits that he never traced green, only assumed that it had to be there. Konstance Ozols published an article where she mentioned that the colours of the women's shawls might have been dark blue or dark brown, while the tablet-woven bands contained pairs of colours: red and blue, red and yellow, red and green, yellow and brown (Ozols 1939, 85). Of the researchers who have touched upon specifying colours, only Auskaps, Ginters and Ozols mentioned the methods that had been used for clarifying colours: microsublimation, spectroscopy, and chemical analysis. Hugo Riekstins described the colours of a man's arm band: it was made of blue fabric with red, yellow and blue fringes (Riekstins 1939, 72). Anna Zarina, the only Latvian textile researcher of the Soviet period, identified the colour of several textile fragments. She distinguished that fabrics had usually been dark blue, brown and yellowish brown. The most widespread colours of tablet-woven bands had been blue, red and yellow, and the ground of women's head ornaments had been red (Zarina 1970, 57-58, 72, tables 4, 6, 10-16, 21, 23, 26). Irita Zeiere analysed the textiles of Tiras Bog hoard and noticed that the cape found in the hoard had been dyed blue, the hood – yellowish brown, the leg wraps – brownish red, and the plaited yarn as well as the yarn used for sewing – red (Zeiere 2008, 130-134). After the re-establishment of independence of Latvia, financing of archaeological research has been very limited and after Latvia experienced the global financial crisis it has been close to non-existent. In the last 20 years, there has been one attempt to carry out chemical analysis of some textile fragments, however, the results were never published and their interpretation was disputable. Experimental research of how the colours of the textiles would be influenced by burying them in the local soil has never been carried out in Latvia.

My research is the first to concentrate particularly on the colour of the archaeological textiles and thus the first in this field. Sadly, the lack of financing made it



Fig. 1. A remarkably well preserved fragment of a woman's shawl from Galgauska, stray find, 12th century AD, National History Museum of Latvia RDM I 3666, Table 1 no. 187-191 (Photo: Ieva Pigozne).

impossible to carry out chemical analysis. However, the advantage that the researchers of Latvian textiles have is that sufficiently great number of samples is preserved in very good condition, often making it possible to distinguish their colours even with a naked eye (Fig. 1).

The methods of detecting colours which were examined and tested included a microscope and a spectroscope. In cooperation with Gatis Ikaunieks, application of an Ocean Optics USB4000 spectroscope was tried and the conclusion was that in detecting the colours of archaeological textiles this method was unproductive as all the results contained too much of "unidentifiable dark colour". Finally, the use of an optic microscope has proved to be the best of the available methods in distinguishing the colours. Magnification 120X turned out to be optimal to detect the colour of single fibres. Before starting to work with the archaeological textiles, ten samples of woolen yarns dyed in different colours, as well as samples of natural white and natural grey yarn were examined. In the process of clarifying colours it has been possible to find several samples of fibres in every colour in a very bright and well preserved condition. When poorly preserved fibres of the same sample were also analysed, types of fibre degradation and changes it had brought to the initial bright colour could therefore be identified.

In cases where in the same yarn some darker natural grey fibres could be detected, it was a sign that colour was not very degraded since natural grey fibres are present in most of the local natural white sheep wool of today as well. If the degradation of the fibres was too advanced, all the fibres looked the same - either thin, slightly yellow and transparent or very dark reddish brown. In these two cases, further detection

of the initial colour was impossible. However, if the fibres were better preserved, the general tendencies of colour changes were that fibres that had initially been dyed blue, presumably with woad (*Isatis tinctoria L.*), would turn darker, sometimes close to black, sometimes more green or more violet (Fig. 2). Yellow, red and brown colours had often lost colour and turned paler and greyer, sometimes lighter and more yellowish.

Samples representing the areas of the current day Latvian territory inhabited by the Balts have been selected for analysis (Fig. 3). Textile remains from the finno-ugric Liv-inhabited areas were not included in the research because they could not be used further in the project where data from the archaeological finds and Latvian folklore material were compared.

The results of the analysis of 233 fibre samples are summarised in Table 1. The following is a discussion of the use of every colour that has been detected in the course of the research.

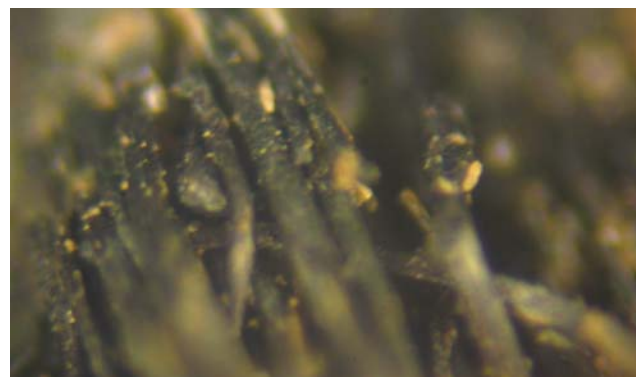
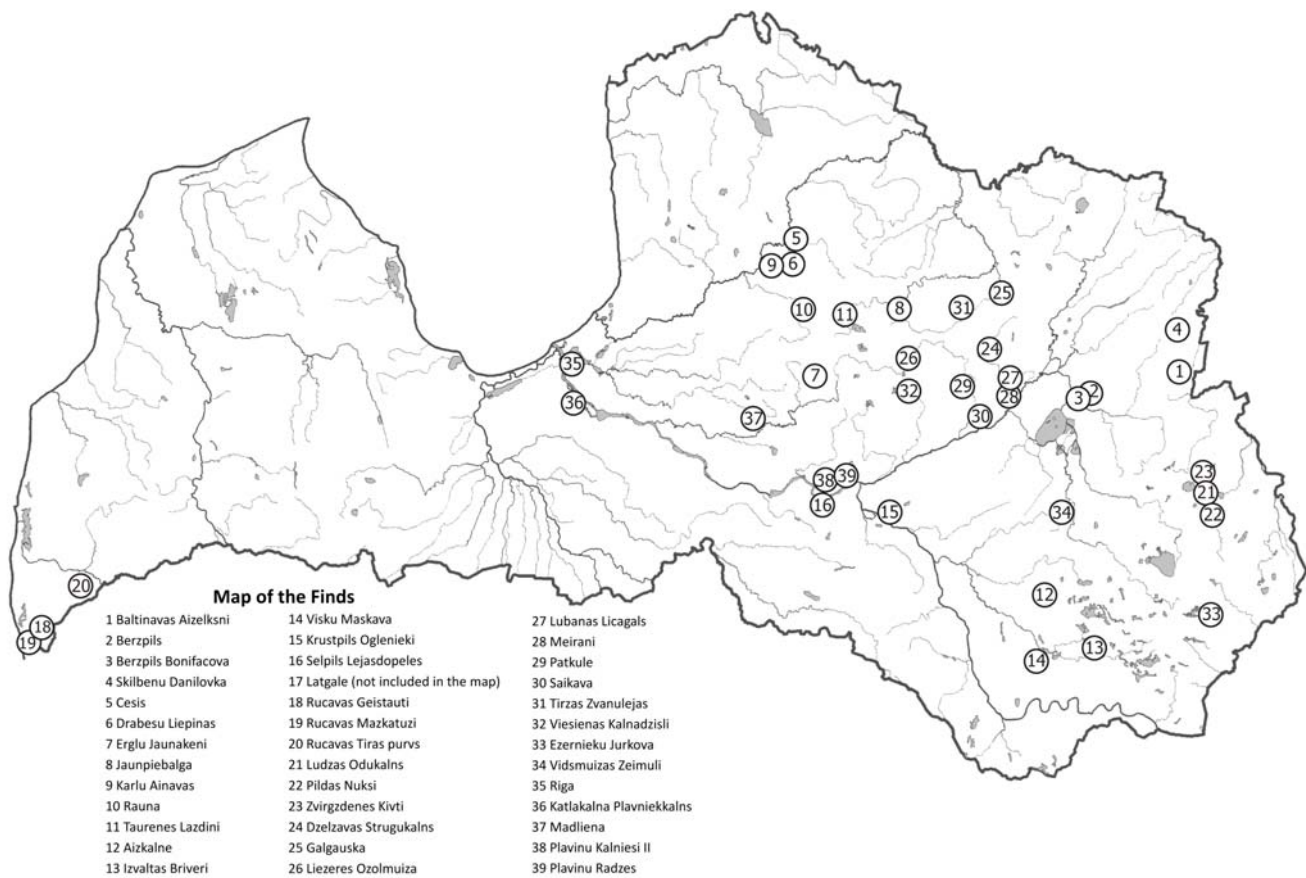


Fig. 2. Sample of relatively well preserved dark blue fibers that have become almost black; some signs of degradation can be observed (Photo: Ieva Pigozne).

Fig. 3. Map of the finds (Illustration: Ieva Pigozne and Ingus Freibergs).



## Discussion

### Blue

The most popular colour of the analysed textile remains is blue. It has been detected in 105 of the 233 samples examined. The use of it would have been even more widespread if a proportionally larger number of women's shawls had been analysed. The aim of this research, however, was to find out the use of all possible colours. This is why a larger number of textile fragments of other colours have deliberately been chosen for the analysis.

Seventy of the 105 occurrences of blue colour were detected in fabrics of the garments. In the female burials it was identified in 20 shawls (or textile fragments that most likely belonged to shawls). Six of the analysed shawls were decorated only with tablet-woven bands sewn to their edges and ends (Table 1 no. 16, 53, 73, 108 (Fig. 6), 182, 205) and one shawl that was decorated with tablet-woven bands and a line of embroidery (Table 1 no. 12). Eleven shawls were decorated with in-woven bronze rings and spirals (Table 1 no. 3, 9, 24, 30, 57, 65, 70, 176, 187 (Fig. 1), 192, 219). Two shawls

were plaid, made of blue wool and natural white linen (Table 1 no. 17, 116). All the analysed fabrics of the shawls were twills woven in single yarn. Blue colour was identified in 13 samples of fabric that could not be associated with a particular garment (Table 1 no. 11, 68, 69, 86, 99, 112, 113, 120, 157, 158, 159, 170, 186). These fragments do not have edges, attached bands or fibulae that would help indicate their function.

In male burials, blue has been detected in 29 samples of fabric: eight coats, seven coats or capes, one cape, three capes or burial covers, one cap, one leg wrap and eight pieces of fabric that could not be identified as having belonged to particular garments. Three of the analysed coat fragments were decorated with in-woven bronze rings (Table 1 no. 91, 94, 233). One of these samples contains a V-neck cut that was tucked and sewn with a plied red woolen yarn (Table 1 no. 94, 95). Another fibre sample of a coat contained a zigzag line of red yarn embroidery (Table 1 no. 143, 144). Fragments of a 14th century AD blue coat were preserved together with a button and an added leather strip (Table 1 no. 213, 214). One fragment of a blue coat



fabric had been found behind a leather belt together with a piece of linen, possibly a shirt (Table 1 no. 145). Seven of the analysed finds were classified as possible fragments of coats or capes. In two cases tablet-woven bands were attached to their edges (Table 1 no. 43, 136) and at least one bronze ring was woven into the second sample. Bronze spirals were added to one of the analysed pieces (Table 1 no. 88). A fibula was found in five of the analysed samples and thus could have served as a preservative of the fabric (Table 1 no. 43, 88, 98, 100, 105). One fragment of blue coat or cape was found under an owl-shaped fibula that is an indicator of a high social status (Table 1 no. 230). A fabric that was found close to a warrior's bracelet and with a fibula put into it was identified as a possible remain of a blue cape (Table 1 no. 97). Three fragments of blue fabric could have been either a coat or a burial cover (Table 1 no. 42, 154, 218). The first two of them were twills and only the third was a plain weave and was found adhering to the remains of a wooden coffin. One of the analysed samples belonged to a head covering, most likely a cap (Table 1 no. 41). Another was a fragment of a leg wrap (Table 1 no. 90). Eight of the analysed samples of blue fabric were not possible to specify as parts of particular garments (Table 1 no. 89, 93, 96, 102, 133, 147, 210, 212).

Six samples of blue fabric from stray finds have been analysed (Table 1 no. 45, 60, 72, 78, 140, 201), as well as one sample that was found in a burial of a baby (Table 1 no. 111). In addition, when discussing the use of blue fabrics, it has to be mentioned that one of the analysed fragments was a brown fabric with four lines of three blue threads woven into it (Table 1 no. 155, 156).

The use of the blue colour has been detected in all types of garments that have been found in archaeological excavation in the Latvian territory. Regrettably, there is no absolute proof of women's skirts and men's trousers either among the analysed fragments or in the archaeological material in general.

Thirty-five cases of the use of blue colour have been found in clothing decoration. In the female burials, blue colour has been detected in 14 tablet-woven bands that were either added to the edges of the shawls or could have been woven sashes. In all of these cases, blue was used together with other colours. In nine tablet-woven bands, blue yarn was used together with red and yellow (Table 1 no. 20, 55, 74, 117, 123, 188 (Fig. 1), 208, 217, 226), in five – together with red (Table 1 no. 5, 13, 26, 114, 124). Blue colour was also detected in five inkle-woven (warp-faced) ribbons. One of them was used as a head ornament (Table 1 no. 63); another could have been a sash (Table 1 no. 179). Three inkle-woven ribbons are of unclear usage. In two of these ribbons blue yarn was used together with red and

yellow (Table 1 no. 81, 130), in three others – together with red (Table 1 no. 63, 179, 204). Blue plied yarn has been detected in six fillings of the head ornaments (crowns) that were made of bronze rings and spirals that were threaded on yarn and sometimes also bast. In five cases, blue yarn was used together with red (Table 1 no. 34, 36, 84, 169 (Fig. 4), 171), in one case together with red and yellow (Table 1 no. 128). Blue and red yarn was also used in an inkle-woven ribbon that belonged to a head ornament (Table 1 no. 63, Fig. 4).

Blue colour was distinguished in a smaller number of dress decorations found in male burials, possibly also because there are fewer decorations on the textiles excavated in male burials. Two arm bands have been analysed. One of them was blue (Table 1 no. 149), the other was made as a blue and red inkle-woven band (Table 1 no. 178). Blue, red and yellow yarn was detected in one tablet-woven band (Table 1 no. 137). Three pieces of blue yarn were used for threading bronze spirals on them: in one case red was also used (Table 1 no. 39), in another yellow was used, too (Table 1 no. 152, 153). In the fringes of this spiral decoration, two slightly different shades of blue were used.

Among the stray finds, one use of blue has been detected in a tablet-woven band (Table 1 no. 46 (Fig. 7)) and in an inkle-woven ribbon (Table 1 no. 197), in both cases – together with red and yellow. Similarly, in both these cases the plied yarn that was used for sewing the bands to the fabric was also blue (Table 1 no. 49, 200).

Chronologically, the oldest finds where blue colour was traced were from Rucavas Geistauti burial ground that dates back to the 5th-6th centuries AD. These are textile fragments, probably shawls that were found in female burials (Table 1 no. 157, 158, 159). Two of the analysed samples that contained unidentifiable colour also come from this burial ground, and it is possible that they might have been blue as well (Table 1 no. 161, 162). Two samples are from the 8th century AD burials in Zvirgzdenes Kivti burial ground: remains of a shawl that was decorated with bronze rings (Table 1 no. 176) and an inkle-woven ribbon of blue and red, possibly an arm band (Table 1 no. 178). The majority of the analysed fabrics and decorations that were blue dated to the 10th-13th centuries AD. The latest of the analysed blue fabrics were a stray find from the 13th-14th century in Liezeres Ozolmuiza (Table 1 no. 201) and 14th-century coat fragments from Viesienas Kalnadzisli (Table 1 no. 213, 214).

#### **Brown**

Evidence of using brown colour has been detected in 21 of the 233 analysed textile samples. It has to

be emphasised that brown fabrics are the only ones that contain any colour other than blue. Therefore textile fragments that were supposed to be brown were selected for the study on purpose. This is why statistically the proportion of brown fabrics versus blue fabrics could be much higher in favour of the blue ones.

No certain use of brown has been identified in the textiles from female burials. It is most likely that two pieces of fabric that used to be covers of the burial could have been dyed brown. One of them is a fulled twill fragment that has been found at Rucavas Mazkatuzi (Table 1 no. 163). The other is a twill fabric that has been found over the neck rings, sometimes in two layers (Table 1 no. 222).

The other two uses of brown in the fabrics of female burials are not certain either. One of them is a herringbone twill fabric with selvages (Table 1 no. 38). This indicates that the fabric could have belonged to a skirt or a cape that might have been made of several pieces sewn together. It is also possible that these fragments are from a coat. Light brown colour was identified in a fabric from Madonas Strugukalns (Table 1 no. 181). The colour could be a result of dyeing but it is also possible that the initial colour of the fabric was naturally white that had turned into light brown while buried in the ground.

The majority of the brown fabrics - 15 samples - come from the male burials. Two of the identified brown fabrics have most likely belonged to coats (Table 1 no. 1, 209). It is possible that one of the analysed brown felted fabrics with a fibula in it is a fragment of a cape (Table 1 no. 2). It seems unlikely that textiles buried in the Rucavas Tiras bog hoard were burial covers. So a light brown twill fabric with one sewn edge and darker reddish brown stripes (of six warp threads) could have been a cape (Table 1 no. 165, 166). Tiras

bog hoard contained fragments of reddish brown leg wraps woven in herringbone twill and with lots of mending (Table 1 no. 167). One brown fragment of a plain weave from the same hoard was also analysed (Table 1 no. 164). It is not possible to tell what piece of clothing it initially belonged to. Except for one blue cape, other textile fragments of the hoard were brown fabrics that could have belonged to some 15 different garments. None of these fragments contained bronze rings or spirals. This suggests that brown clothing might have been more suitable for everyday wear and not considered very prestigious.

In four cases brown colour was detected in fabrics that might have belonged to capes or burial covers (Table 1 no. 21, 104, 146, 148). Two fabrics that come from unidentified garments contain brown (Table 1 no. 211) and reddish brown colour (Table 1 no. 175). Usage of brown colour in one cap has been detected (Table 1 no. 229). A practice whereby a spiral (or most likely multiple spirals) was sewn to a head covering with the help of a light brown yarn has been noted only once (Table 1 no. 231). There is a slight possibility that initially this yarn might have been naturally white. This is the only time when brown yarn has been used in the decorations of the dress and therefore can be looked upon as an exception.

There are two samples of brown fabric that are stray finds. One of them was a plain weave (Table 1 no. 221); the other was a twill with four lines of three blue threads woven in (Table 1 no. 155-156). Regrettably, it is not possible to determine what garment these pieces might have belonged to. Only two cases of striped fabrics have been detected and analysed in this research project, and it seems that stripes have not been a widespread way of decorating the fabrics.

It has to be emphasised that brown, brownish, reddish brown, greenish brown, and greyish brown colours



**Fig. 4.** A fragment of a woman's head ornament made of bronze rings and spirals threaded on plied yarns from Ludzas Odukalns burial ground, 11th century AD, National History Museum of Latvia RDM IV 119a,b, Table 1 no. 168-169 (Photo: Ieva Pigozne).

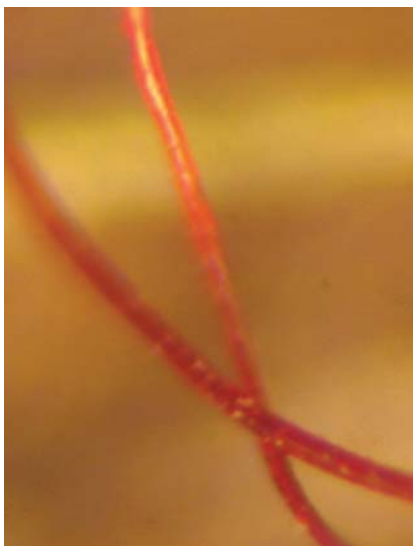


have been noted only in woven fabrics. As mentioned before, the only exception was the yarn used for sewing a spiral to a fur cap. Brown has not been detected in any other decorations and ornaments. Another observation is that bronze rings and spirals have not been woven into any brown fabrics. This again suggests that brown garments might have been considered less valuable than the blue ones.

Chronologically, the oldest find where brown colour was detected is a felted twill fragment that could have been a female cape or burial cover. It is dated to the 3rd-4th century AD and was excavated at Rucavas Mazkatuzi (Table 1 no. 163). The next in line is a brown wool fabric from a female burial in Katlakalna Plavniekkalns dated to the 5th-6th century AD (Table 1 no. 222). The next are male garments from the Rucavas Tiras bog hoard that is dated with the 9th century AD (Table 1 no. 164-167). The rest of the analysed fabrics can be dated to the 10th-13th centuries. The latest analysed sample is a coarse plain weave fragment (Table 1 no. 221) from recent excavations in the inner courtyard of Riga castle. It was found in the layer dated to the 13th-14th centuries. Most likely this sample does not represent the dress of the local people. It was however selected for analysis because it was well preserved.

### Red

None of the analysed fabric samples turned out to be red. Red colour has only been distinguished in 76 ornaments and decorations of the garments. This makes red to be the most popular colour used for details. Due to lack of time in several cases the fabrics of the shawls were detected blue with a naked eye and not analysed further so that more decorative



**Fig. 5. Red fibres in the tablet-woven band of the shawl from Galgauska, 12th century AD, National History Museum of Latvia RDM I 3666, Table 1 no. 189 (Photo: Ieva Pigozne).**

tablet woven-bands of the shawls could be studied. This is why more data on the blue fabrics together with the analysed bands and other decorations could proportionally be presented.

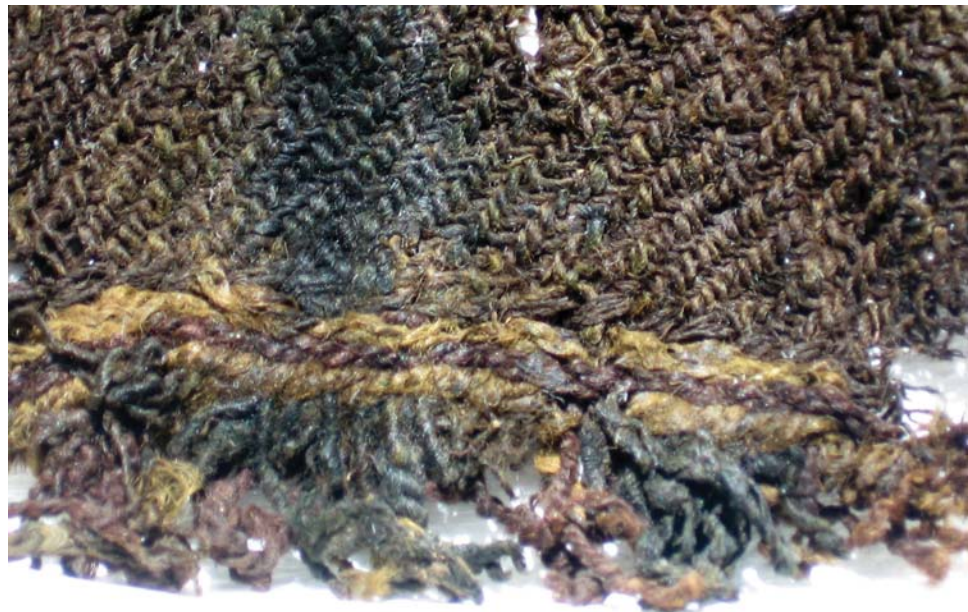
Red was more often used in the decorations of the female dress – in 55 of the analysed samples (Fig. 5). In 23 cases, these were tablet-woven bands. In these bands red yarn was most frequently used together with blue and yellow. Eight such bands were identified (Table 1 no. 19, 54, 59, 109, 119, 206, 216, 227). Four bands contained red used together with blue (Table 1 no. 4, 25, 115, 225) and another four where it was together with yellow (Table 1 no. 31, 59, 107, 184). In two of them (Table 1 no. 31, 107), the use of yellow is not certain, as initially this might have been blue that had degraded. There are two other interesting examples of bands where two different shades of red had been used: one was brighter, the other more gingery (Table 1 no. 75 and 76, 189 and 191 (Figs 1 and 5)). It is possible that differences existed already when the bands were woven. Finally, three tablet-woven bands where red was better preserved and therefore the only analysed colour are included in the research (Table 1 no. 8, 10, 67).

An observation was made that red was usually used as one of the colours of the woven ornament, while the edges of the bands were most often woven in blue yarn. If red was used for the edges of the ornamental line, blue usually followed it as the finishing line. Such bands were commonly sewn to the fabrics of the shawls with blue plied yarn. There are, however, two cases when red was used instead, thus creating a decorative stitch (Table 1 no. 7, 215-217).

A few of the shawls have tablet-woven bands that were made using only three or four tablets. These simple striped bands were sewn to the edges and the ends of the shawls. The most frequent colour scheme was: yellow, red, yellow, blue. A relatively well preserved example of such band was found in Krustpils Oglenieki burial ground (Table 1 no. 108-109, Fig. 6). Colour schemes of the bands made using only three tablets usually were: yellow, red, yellow, as on a band from Erglu Jaunakeni burial ground (Table 1 no. 58-59). Another scheme was red, blue, red, *e.g.* on a band from Drabesu Liepinas burial ground (Table 1 no. 25-26). In both the ornamented and the striped tablet-woven bands, blue yarn was usually used for the weft. There are, however, exceptions when red yarn is used instead and thus a line of red decorative dots is created on both edges of the band. One such band from Skilbenu Danilovka burial ground was included in the analyses (Table 1 no. 10).

The tradition was that the tablet-woven bands that were woven onto the ends of the shawls also had

**Fig. 6.** A fragment of a woman's shawl from Krustpils Oglenieki, burial no. 8, 12th century AD, National History Museum of Latvia VI 3: 79, Table 1 no. 108-109 (Photo: Ieva Pigozne).



inwoven fringes. Many of the finds have relatively well preserved bands and poorly preserved fringes. However, in some cases, fringes are still there and it is possible to notice that the colours used in the bands and fringes are mostly the same. One example of such fringes was analysed in this research project and two different tones of red colour were detected: bright red and darker brownish red (Table 1 no. 193, 194).

Red colour has been identified in six inkle-woven ribbons from female burials. In two of them red was the only colour (Table 1 no. 27, 28); in another two red was used together with blue (Table 1 no. 180, 203). In the last two, red yarn was used together with blue and yellow (Table 1 no. 83, 132). One ribbon (Table 1 no. 83) was sewn to the edge of a shawl. Another could have been a fragment of a sash (Table 1 no. 180). The initial function of the other four is unclear.

Five head ornaments that had been made of red inkle-woven ribbons or tablet-woven bands have been analysed. In all five cases, red was the only detected colour (Table 1 no. 6, 29, 110, 121, 224). One head ornament contains bronze spirals threaded on woolen yarn, bast twist wrapped in plied yarn, and a tassel of fringes with two cowries tied to it. Analyses of the fringes revealed the use of red plied yarn (Table 1 no. 220). Though cowry shells are not native to Europe, their use in Latvian women's necklaces and other ornaments was very popular. Another head ornament was made as a red tablet-woven band with inwoven bronze spiral ornament. Close to it, other fragments of red band, plaited yarn and yarn tassels were excavated. Use of red was identified in these fragments of the head ornament (Table 1 no. 22, 23). Yet another of

the analysed head ornaments was made of an inkle-woven ribbon with inwoven bronze spirals. Red and blue colours were detected in this ribbon (Table 1 no. 64). Red plied yarn was identified in all six of the analysed head ornaments that were made of bronze rings and spirals threaded on yarn. In five cases, red yarn was used together with blue (Table 1 no. 33, 35, 85, 168 (Fig. 4), 172) and once – together with blue and yellow (Table 1 no. 126). Two instances of red yarn have been found in the decorations that were made of bronze spirals attached to a garment. It is most likely that one of them belonged to a head ornament (Table 1 no. 223). The other is a decoration that was sewn to a fragment of blue fabric (Table 1 no. 87).

Embroidered lines of red plied yarn have been traced on three shawls. In two cases, one shade of red was identified (Table 1 no. 15, 66). In the third, however, there appeared repeating stretches of brighter red and darker brownish red embroidery (Table 1 no. 71).

Finally, a single yarn wound several times round a pin in a female burial at Rucavas Geistauti revealed the usage of red colour (Table 1 no. 160). It is difficult to tell what its function might have been, as it could have been applied for purely decorative, as well as magical – protective or harming – purposes.

Usage of red is much less frequent in male burials, as only 13 instances of red yarn have been identified during the project. In female burials, as in male dress, red colour was only used in decorations. One of the two analysed arm bands was made as an inkle-woven ribbon of blue and red yarn (Table 1 no. 177). No other inkle-woven ribbons have been identified in male burials. Analysis of four tablet-woven bands



shows that one such band was made of single red yarn (Table 1 no. 44). It was attached to a fabric to which a fibula was fastened. This band is the only one of all the analysed tablet-woven bands that revealed usage of single yarn. Three other analysed bands were excavated in a burial of a wealthy man in Selpils Lejasdopeles cemetery. Two of the bands were made of red and yellow yarn (Table 1 no. 134, 142). In one band, red was used together with blue and yellow (Table 1 no. 139). A fragment of a blue fabric that had embroidery of red yarn loops was excavated under the fibulae in the same burial. In addition, red plied yarn together with yellow and two different tones of blue yarn were detected in a tassel of fringes (Table 1 no. 150).

Red yarn used for threading bronze spirals of dress decorations has been detected in two male burials (Table 1 no. 40, 174). One embroidered line of twisted red yarn on a fabric has also been identified (Table 1 no. 144). One of the analysed samples was a twisted red yarn that had been used for sewing the edge of the V-neck cut of a man's blue wool coat that had been decorated with inwoven bronze rings. In this case the stitches of the red yarn must have had a decorative function (Table 1 no. 95). Similar red stitching has been noticed in a find from Priekulu Gugeris burial ground. Finally, three cases of red yarn that had been tied to jewellery have been detected in male burials (Table 1 no. 92, 101, 103). Two are from the same burial where red yarn was found tied to two fibulae. A smaller, most likely female ring is tied to one of the fibulas. It is possible that some decayed object was tied to the other, as well. It can be presumed that these represent an offering of female belongings in a male burial.

Red colour has been identified in eight decorations that belong to stray finds. In one tablet-woven band, red is used together with blue and yellow (Table 1 no. 47, Fig. 7), in another it is used together with yellow (Table 1 no. 62). Red, blue, and yellow yarn has been distinguished in an inkle-woven ribbon (Table 1 no. 198). Four cases of embroidered lines of red plied yarn have been noted. Three of them are applied to wool fabrics (Table 1 no. 50, 79, 196). The first is made of regularly repeating stretches of brighter red and darker brownish red. A remarkable find is an almost disintegrated linen fabric with embroidery of red plied yarn loops (Table 1 no. 80). This fragment might have been a part of the neck opening of a linen shirt and thus contains evidence of using red wool embroidery for linen garments. Finally, red yarn was identified in fringes attached to thick twill fabric where it was used together with another colour, likely yellow (Table 1 no. 51).

Chronologically, the oldest find where red colour was traced is from the Rucavas Geistatuti burial ground (Table 1 no. 160). It is red single yarn wound around the pin in a female burial of the 5th-6th century AD. The next two uses of red are detected in male burials: an 8th-century AD arm band from Zvirgzdenes Kivti burial ground (Table 1 no. 177), and a 9th-century AD decoration made of red yarn and bronze spirals excavated in Drabesu Liepinas burial ground (Table 1 no. 40). The rest of the samples can be dated to the 10th-13th centuries AD.

### *Yellow*

Distinguishing yellow with the help of an optic microscope is sometimes problematic as disintegrated colour of degraded fibres can seem to be yellowish. This is why only those usages of yellow that were convincing enough are presented in this paper. It is important to emphasise that yellow has been identified rather rarely. Twenty-one of the 233 analysed samples revealed yellow colour. Three more cases are not certain. Like red, yellow colour can be observed only in plied yarn used to decorate dress. Moreover, yellow was always used together with red and/or blue.

Sixteen uses of yellow have been detected in female burials, 13 of them – in tablet-woven bands. In six of the bands, yellow was used together with blue and red (Table 1 no. 18, 56, 118, 207, 215, 228). In four cases, yellow was used together with red. However, in only two of them it is absolutely certain that this was yellow colour (Table 1 no. 58, 183). The other two bands could have been made of red and yellow or blue yarn (Table 1 no. 32, 106). There are two more tablet-woven bands where yellow was used together not only with blue but also with two different shades of red: bright red and gingery red (Table 1 no. 77, 190; Fig. 1). There is only one band where yellow was only used together with blue (Table 1 no. 122). In female burials, yellow has been detected in two inkle-woven ribbons where it was used together with red and blue (Table 1 no. 82, 131). Finally, yellow, red, and blue plied yarns were detected in the threading of one head ornament made of bronze rings and spirals (Table 1 no. 127).

There is only one male burial where usage of yellow yarn has been proven. This is a burial of a wealthy man from Selpils Lejasdopeles burial ground, dated to the 11th century AD. Yellow yarn has been noted in three tablet-woven bands from this burial. In one of them, yellow was used together with red and blue (Table 1 no. 138), in the other two – together with red (Table 1 no. 135, 141). The third band was sewn to a piece of fabric that was wrapped around pieces of female jewellery and placed next to the feet of the deceased

(Snore 1997, 72). In the same burial, yellow has also been found in the yarns that were used for threading bronze spirals of a decoration (Table 1 no. 151), where yellow was used together with red and two different shades of blue: intense dark blue and greenish blue.

Yellow colour used in textile decorations has been detected in four stray finds. In one tablet-woven band, yellow was used together with red and blue (Table 1 no. 48, Fig. 7), in another band – together with red (Table 1 no. 61). Yellow, red, and blue yarns have been noted in one inkle-woven ribbon (Table 1 no. 199). One sample of (most likely) yellow being used in the fringes added to a thick twill fabric has been detected (Table 1 no. 52).

It can be concluded that yellow seems to be a characteristic colour of female dress. In the process of selecting samples for the analyses, yellow colour was deliberately searched for in textiles from male burials, although with little success. It is possible that people buried in Selpils Lejasdopeles burial ground were more fond of yellow than others. This can be suggested as one third of all the samples of yellow yarn used for the analysis came from this particular burial ground. Chronologically, yellow has been detected in textiles that belong to the narrowest range of time, as most of them are dated to the 11th-13th centuries AD. The latest sample of yellow is from a stray find of an inkle-woven band dating back to the 13th-14th century (Table 1 no. 199).

#### Final remarks

Although Ginters (Dzervitis and Ginters 1936, 26-54) and Ozols (Ozols 1939, 85) considered that green had been used in the textiles of the 8th-12th centuries AD, no convincing proof of green yarn has been found so far. It has been possible to observe two different shades of blue used in the same textile fragment (Table 1 no. 45 and 46; 152 and 153). In these cases, more intense

dark blue has been used together with greenish blue. No colours other than those discussed in this paper were distinguished in the analysed textiles.

Blue and brown single yarns have been detected in the analysed fabrics, while blue, red, and yellow plied yarns have been distinguished in the decorations of the dress. Red and yellow were more frequently observed in female dress. Such a colour scheme seems to have been popular in the Baltic-inhabited areas of the Latvian territory in the 3rd-14th centuries AD. However, further research of the colours, by means of identification of the dye compounds present in the fibres using chemical analyses, could provide more precise information about the colour and also elucidate issue of fading or degradation.

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Fig. 7. A reconstructed tablet-woven band from Drabesu Liepinas burial ground, Table 1 no. 46-48 (Reconstruction and photo: Ieva Pigozne).



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**Table 1. Colours in the Latvian archaeological wool textiles.**

No.	(Number of the site according to Fig. 3), site, burial number, gender of the buried person, collection and accession number of the artefact, dating	Description of the find; possible function	Colours as seen in the microscope	Assumed initial colour
<i>Abrene region</i>				
1	(1) Baltinavas Aizelksni, grave 1, male, A 7449:17, 12th-13th cent.	Fragment of a twill fabric. Possibly from a coat.	In the fabric – brown, some hairs – dark.	Brown
2	(1) Baltinavas Aizelksni, grave 1, male, A 7449:19, 12th-13th cent.	Fragment of a felted twill fabric, a fubula put into it. Possibly from a cape.	In the fabric – dark brown, normally preserved fibres.	Brown
3	(2) Berzpils, stray find, female, A8044:17, 12th cent.	Fragment of a shawl – a twill fabric, inwoven bronze rings, a tablet-woven band attached to the edge.	In the fabric – dark blue-black, some hairs – brownish or greenish.	Blue
4			In the tablet-woven band – reddish brown.	Red
5			In the tablet-woven band – blue-black.	Blue
6	(3) Berzpils Bonifacova, stray find, female, RDM IV 41, 10th-13th cent.	Head ornament made of a plain weave fabric, very small spirals sewn to it.	In the head ornament – red, some hairs – of a cooler red tone.	Red
7		Fragment of a shawl, inwoven bronze rings. A tablet-woven band is sewn to the fabric with the help of a plied yarn.	In the yarn of the sewing – gingery, some hairs – bright red (slightly orange).	Red
8		A tablet-woven band, made of plied yarns.	In the tablet-woven band – gingery, some hairs bright red (cooler red tone than that of the sewing).	Red



No.	(Number of the site according to Fig. 3), site, burial number, gender of the buried person, collection and accession number of the artefact, dating	Description of the find; possible function	Colours as seen in the microscope	Assumed initial colour
9	(4) Skilbenu Danilovka, group II, barrow 1, grave 2, female, VI no accession number, 12th-13th cent.	Twill fragment of a shawl, inwoven bronze rings, a tablet-woven band, blue weft, the band is sewn to the fabric with the help of a blue yarn, a fibula put into the shawl.	In the fabric – bright woad blue, little greenish.	Blue
10			In the tablet-woven band – reddish orange, some hairs – yellowish orange, some – darker reddish brown.	Red
11		Fragment of a twill fabric.	In the fabric – dark blue-black.	Blue
12	(4) Skilbenu Danilovka, barrow 1, grave 2, female, VI no accession number, 12th-13th cent.	Fragments of two shawls: one tartan and one blue, not decorated. The second shawl has two lines of embroidery ~5 mm before the tabled-woven band which fringes that is attached to the end of the shawl.	In the fabric of undecorated shawl – dark blue.	Blue
13			In the tablet-woven band on the end of the shawl – blue.	Blue
14			In the tablet-woven band on the end of the shawl – reddish.	Red
15			In the embroidery – red.	Red
16	(4) Skilbenu Danilovka, group II, barrow 3, grave 2 (?), female (disturbed), VI no accession number, 12th cent.	Fragment of a twill fabric (shawl?).	In the fabric – dark blue-black.	Blue
17		Fragment of a twill tartan fragment of a shawl.	In the fabric – dark blue-black.	Blue
<i>Cesis region</i>				
18	(5) Cesis, female, A 185, 12th-13th cent.	Fragment of a shawl, inwoven bronze rings, a tablet-woven band attached to it.	In the tablet-woven band – brownish yellow.	Yellow
19			In the tablet-woven band – reddish.	Red
20			In the tablet-woven band – blue-black.	Blue
21	(6) Drabesu Liepinas, grave 1, male, VI 155: no accession number, 11th cent.	A fragment of a twill fabric, found over the belt and the warrior's bracelet.	In the fabric – dark reddish-brown, some hairs almost black, some – colour of rust.	Brown (or blue)
22	(6) Drabesu Liepinas, grave 24, female, VI 155:138, 12th cent.	Head ornament made of a tablet-woven band, inwoven tiny spirals that make a zigzag ornament.	In the tablet-woven band – some of the hairs – light orange, some – pale red, some – pale brownish red, disintegration of the fibres can be observed.	Red
23	(6) Drabesu Liepinas, grave 24, female, VI 155:179, 12th cent.	Fragments of tablet-woven bands, plaited yarn, yarn tassels, found close to the head ornament.	In the band and the plaited yarn – part of the hairs – brighter red than in the head ornament.	Red



No.	(Number of the site according to Fig. 3), site, burial number, gender of the buried person, collection and accession number of the artefact, dating	Description of the find; possible function	Colours as seen in the microscope	Assumed initial colour
24	(6) Drabesu Liepinas, grave 37, female, VI 155:257, 12th cent.	Many fragments of a shawl, one fragment with inwoven bronze rings, twill fabric.	In the fabric – most hairs dark red-brown and dark purple; one fragment – possibly dark blue-black.	Blue (?)
25		A tablet-woven band of plied yarn (3 tablets).	In the edges of the tablet-woven band – reddish orange (dark).	Red
26			In the middle line of the tablet-woven band – possibly blue.	Blue (?)
27		Six fragments of inkle-woven (?) ribbon, made of single colour plied yarn.	In the ribbons – dark orange-brownish, disintegration can be observed – some hairs light yellowish, the thickest fibres – dark reddish-brown purple.	Red (?)
28	(6) Drabesu Liepinas, grave 37, female, VI 155:257, 12th cent.	Six fragments of 20 mm wide inkle-woven ribbon, made of plied yarn.	In the ribbons – part of the warp – dark cool red. Many areas of disintegrated fibres and unidentified colour.	Red
29	(6) Drabesu Liepinas, grave 72, female, VI 155:483, 12th cent.	Fragments of a head ornament, made of a 12 mm wide inkle-woven ribbon.	In the ribbon – reddish brown, some places – darker and paler. Possibly used to have a cool red shade. The whole ribbon is in single colour.	Red (?)
30	(6) Drabesu Liepinas, grave 79, female, VI 155:530, 11th cent.	Fragments of a shawl, inwoven bronze rings, a tablet-woven band attached to the fabric.	In the fabric – dark blue-black.	Blue
31			In the tablet-woven band – reddish, pale.	Red
32			In the tablet-woven band – yellowish, probably used to be yellow (or blue). Disintegration of the fibres can be observed.	Yellow (or blue)
33	(6) Drabesu Liepinas, grave 79, female, VI 155:533, 11th cent.	Head ornament, made of four lines of bronze rings and spirals threaded on coarse plied yarn.	In the filling of the ornament – reddish, the colour and its changes (darker, more yellow) can be well observed.	Red
34			In the filling of the ornament – dark bluish.	Blue
35	(6) Drabesu Liepinas, grave 79, female, VI 155:545, 11th cent.	Head ornament, made of bronze rings and spirals threaded on bast that was wrapped in plied yarn.	In the filling of the ornament – reddish.	Red
36			In the filling of the ornament – blue.	Blue



No.	(Number of the site according to Fig. 3), site, burial number, gender of the buried person, collection and accession number of the artefact, dating	Description of the find; possible function	Colours as seen in the microscope	Assumed initial colour
37	(6) Drabesu Liepinas, grave 85, male, VI 155:576, 11th cent.	Fragments of a cap, three tight lines of bronze spirals along the brim.	In the fabric – unidentifiable colour; disintegrated fibre. In some places – light yellowish; some hairs darker, some dark brown.	Un-identifiable
38	(6) Drabesu Liepinas, grave 95, female, VI 155:691, 11th cent.	Fragments of a herringbone twill fabric, one with a seam, two selvages.	In the fabric – light yellowish fibres, no darker hairs can be detected. In the middle of the yarn – orange-light brownish hairs. Probably used to be dyed light brown.	Brown (?)
39	(6) Drabesu Liepinas, grave 123, male, VI 155:830, 9th-beginning of the 10th cent.	Decoration of bronze spirals that are threaded on plied yarn.	In the filling of the spirals – dark blue, some hairs disintegrated.	Blue
40			In the filling of the spirals – reddish dark brown, some hairs disintegrated. One hair intense bright red.	Red
41	(6) Drabesu Liepinas, grave 123, male, VI 155: 835, 9th-beginning of the 10th cent.	Remains of a cap that used to be decorated with bronze spirals, only some plied yarns left.	In the fabric – dark blue, some hairs have lost colour or turned brown.	Blue
42	(6) Drabesu Liepinas, grave 138, male, VI 155: no accession number, 10th-11th cent.	Three small fragments of twill fabric. One of them found by a fibula, another – by a warrior's bracelet. Warp and weft yarns of different thickness.	In the fabric – various hairs: many bright yellow, some greenish or green, some reddish brown-black, one hair – light red. In another sample some hairs of the same yarn dark blue, some dark reddish brown. Probably the fabric used to be blue or blue and red (warp and weft of different colour).	Blue (or blue and red?)
43	(6) Drabesu Liepinas, grave 147, male, accession number of the horse-shoe fibula VI 155:931, 10th-12th cent.	Fragment of a fine twill fabric, a fine tablet-woven band (made of single yarn) attached to the fabric. A horse-shoe fibula put into the fabric.	In the fabric – many hairs yellowish, some dark, some dark blue. Probably the fabric was dark blue.	Blue
44			In the tablet-woven band – dark red hairs of a cooler tone.	Red



No.	(Number of the site according to Fig. 3), site, burial number, gender of the buried person, collection and accession number of the artefact, dating	Description of the find; possible function	Colours as seen in the microscope	Assumed initial colour
45	(6) Drabesu Liepinas, stray find (?), CMV 5603, 10th-12th cent.	Fragment of a coarse twill fabric with a tablet-woven band (of 8 tablets). The band sewn to the fabric with a plied yarn. Embroidered line of a plied yarn on the fabric, some ~3 mm from the band. Colours well preserved.	In the fabric – dark blue.	Blue
46			In the tablet-woven band – bluish, dark blue-green.	Blue
47			In the tablet-woven band – red, slightly gingery.	Red
48			In the tablet-woven band – bright golden yellow, parts of the band disintegrated.	Yellow
49			In the yarn of the sewing – blue.	Blue
50			In the yarn of the embroidery – stretches of dark cool red and stretches of yellowish gingery.	Red
51	(6) Drabesu Liepinas, stray find, VI 154: no accession number, 19th-12th cent.	Two fragments of a dense twill fabric. Fringes of two plied yarns and a knot in the end. The longest fringe 154 mm. Several inwoven bronze rings.	In the fringes – reddish (has turned darker).	Red
52			In the fringes – yellowish, used to be yellow (or blue).	Yellow or blue
53	(7) Erglu Jaunakeni, grave 22, female, VI 154: 596, 11th-12th cent.	Fragment of a twill fabric – an undecorated shawl. A tablet woven band (6 tablets: red, 3 yellow, red, blue) attached to the edge of the shawl.	In the fabric – dark bluish.	Blue
54			In the tablet-woven band – reddish brown-purple.	Red
55			In the tablet-woven band – dark bluish.	Blue
56			In the tablet-woven band – yellow.	Yellow
57	(7) Erglu Jaunakeni, grave 26, female, VI 154: 216, 11th-12th cent.	Fragments of a twill fabric – a shawl with inwoven bronze rings and spirals. A tablet-woven band (of 3 tablets: yellow, red, yellow) at the end of the shawl.	In the fabric – dark blue-black.	Blue
58			In the tablet-woven band – intense yellow.	Yellow
59			In the tablet-woven band – brownish red.	Red
60	(7) Erglu Jaunakeni, stray find, VI 154: 594, 11th-12th cent.	Fragment of a twill fabric, inwoven bronze rings. Tablet-woven bands (of 3 tablets: yellow, red, yellow) at the edges and the ends of the shawl (?).	In the fabric – dark blue.	Blue
61			In the tablet-woven band – bright yellow.	Yellow
62			In the tablet-woven band – darker reddish.	Red



No.	(Number of the site according to Fig. 3), site, burial number, gender of the buried person, collection and accession number of the artefact, dating	Description of the find; possible function	Colours as seen in the microscope	Assumed initial colour
63	(8) Jaunpiebalga, grave 1, female, VI 5:1, 13th cent.	A head ornament – an inkle-woven ribbon made of plied yarn, inwoven bronze spirals. In the edges – blue, in the middle line – red.	In the edges of the ribbon – greenish gray.	Blue
64			In the middle lines of the ribbon – intense red, slightly orange, possibly used to be light red (of slightly cool red tone). Some hairs yellow or dark.	Red
65	(9) Karlu Ainavas, female, A 9476: 3, 12th cent.	Fragment of the end of the shawl with a tablet-woven band (of ~6 tablets) and fringes. A line of embroidery of a plied yarn sewn on the fabric some 5 mm from the end.	In the fabric – blue, dark black-blue.	Blue
66			In the embroidery – some hairs orange, some reddish with bright red gloss, some pale light orange.	Red
67			In the tablet-woven band – reddish.	Red
68	(9) Karlu Ainavas, grave 4, female, A 3362, 12th cent.	Two fragments of plain weave fabric.	Dark greenish-black, some hairs brownish, where the color was lost – half of the hairs yellowish, half – pale blue.	Blue
69		Fragment of a twill fabric.	In the better preserved places of the fabric – dark blue-black, one hair bright blue. In the poorly preserved places – some hairs yellowish, some dark blue/green, some dark brownish.	Blue
70	(10) Rauna, stray find, RDM I 3676b, 11th-13th cent.	Fragment of the end of the shawl, inwoven spirals, fringes. Double line of embroidery on the fabric: stretches of red and dark reddish brown.	In the fabric – dark blue-black; fibres well preserved.	Blue
71			In the embroidery – dark red.	Red
72	(11) Taurenas Lazdini, grave 7, A 3491 (?), 10th-12th cent.	Fragments of twill fabric. One fragment with a seam, one with a hem. Possibly a coat.	In the fabric – dark greenish blue-black.	Blue



No.	(Number of the site according to Fig. 3), site, burial number, gender of the buried person, collection and accession number of the artefact, dating	Description of the find; possible function	Colours as seen in the microscope	Assumed initial colour
73	(11) Taurenas Lazdini, grave 9, female, A 3520, 12th cent.	Large fragments of a shawl with tablet-woven bands at the edges (blue, gingery, red, yellow) and ends (gingery, red, yellow, blue). Fringes.	In the fabric – blue-green black.	Blue
74			In the tablet-woven band – blue.	Blue
75			In the tablet-woven band – gingery-yellow.	Gingery (red?)
76			In the tablet-woven band – intense orange-red.	Red
77			In the tablet-woven band – light yellow.	Yellow
78	(11) Taurenas, stray find, A 7694: 2, 10th-12th cent.	Fragment of a twill fabric with a zigzag embroidery of plied yarn.	In the fabric – dark blue.	Blue
79			In the embroidery – orange, some hairs – brighter red.	Red
80		Embroidered curves of plied woollen yarn on a linen shirt (?).	In the embroidery – red.	Red
<i>Daugavpils region</i>				
81	(12) Aizkalne, grave 2, female, A 10557:1, 9th-11th cent.	Fragments of a shawl, a fabric with inwoven rings, an inkle-woven ribbon (15 warps) attached to the fabric. Fibulas put into the fabric.	In the inkle-woven ribbon – dark greyish blue.	Blue
82			In the inkle-woven ribbon – yellowish.	Yellow
83			In the inkle-woven ribbon – reddish, some fibres disintegrated, darkened and lost colour.	Red
84	(12) Aizkalne, grave 2, female, A 10557:5, 9th-11th cent.	Head ornament, made of bronze rings and spirals threaded on plied yarn. With a naked eye – red and blue yarn.	In the filling of the ornament – dark blue black.	Blue
85			In the filling of the ornament – reddish, has turned darker.	Red
86	(12) Aizkalne, grave 11, female, A 10566: no accession number, 9th-11th cent.	Fragment of fabric, found by the right knee. With a naked eye – blue.	In the fabric – blue.	Blue
87		One twisted yarn used for threading a bronze spiral, found together with the fabric.	In the yarn – gingery	Red (or gingery?)
88	(12) Aizkalne, grave 12, male, A10566: no accession number, accession number of the fibula A 10567:9, 10th cent.	Fragment of a twill fabric, inwoven bronze spirals, a fibula put into the fabric.	In the fabric – blue.	Blue
89		Fragment of a coarse twill fabric.	In the fabric – blue, disintegrated hairs – yellow.	Blue
90		Fragment of a leg-wrap – a twill fabric.	In the fabric – bluish.	Blue



No.	(Number of the site according to Fig. 3), site, burial number, gender of the buried person, collection and accession number of the artefact, dating	Description of the find; possible function	Colours as seen in the microscope	Assumed initial colour
91	(12) Aizkalne, grave 12, male, A 10567: 2, 10th cent.	Fragment of a coat, inwoven bronze rings, decorated with pendants, a fibula put into the fabric.	In the fabric – dark blue-green-black.	Blue
92		Some pieces of plied yarn tied to the fibula.	In the yarn – brownish red with red-orange gloss.	Red
93	(12) Aizkalne, grave 12, male, A 10567: 13, 10th cent.	Fragment of a twill fabric.	Blue-black.	Blue
94	(12) Aizkalne, grave 18, male, A10573: no accession number, accession number of the fibula A10573:2, 10th cent.	Fragment of a twill fabric – front part of a coat, inwoven bronze rings, a fibula put into the fabric. The edge of the V-neck cut hemmed with plied red yarn.	In the fabric – half of the hairs – blue.	Blue
95			In the yarn of the sewing – red, greyish-brownish red.	Red
96		Fragment of a coarse twill fabric, inwoven bronze rings.	In the fabric – blue.	Blue
97	(13) Izvaltas Briveri, grave 7, male, accession number of the fibula A 13508: 37; accession number of the warrior's bracelet A 13508: 45, 9th-10th cent.	Three fragments of a twill fabric, a fibula put into the fabric. Found by the warrior's bracelet.	In the fabric – some fibres disintegrated (light yellow hairs), some fibres blue or greenish blue.	Blue
98	(13) Izvaltas Briveri, grave 11, male, accession number of the fibula A 13508: 45, 10th cent.	Fragments of a coarse twill fabric, a large fibula put into the fabric. Fragments found also over the fibula.	In the fabric – some hairs dark blue, some fibres disintegrated, some – reddish brown.	Blue
99	(13) Izvaltas Briveri, grave 14, female, accession number of the fibula A 13508: 52, 9th-11th cent.	Fragment of a coarse twill fabric, a fibula put into the fabric.	In the fabric – some hairs blue, some greenish blue, some violet-blue, some yellow (degraded).	Blue
100	(13) Izvaltas Briveri, grave 15, male (?), accession number of the fibula A 13508: 55, 10th-12th cent.	Fragment of a twill fabric, a large fibula put into the fabric.	In the fabric – blue.	Blue
101		A thick, plied yarn tied to the pin of a horse-shoe fibula.	In the yarn – reddish.	Red
102	(13) Izvaltas Briveri, grave 15, male (?), accession number of the fibula A 13508: 57; accession number of the ring A 13508: 58, 10th-12th cent.	Fragment of a twill fabric, a small horse-shoe fibula put into the fabric.	In the fabric – blue.	Blue
103		A thick, plied yarn used for attaching a small (female?) ring to the pin of the horse-shoe fibula.	In the yarn – reddish.	Red



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104	(13) Izvaltas Briveri, grave 36, male, no accession number, 10th cent.	Fragments of a twill fabric, found over a fibula and a warrior's bracelet. Could be a cape or a cover of the burial.	In the fabric – some hairs reddish brown, some disintegrated.	Brown
105	(13) Izvaltas Briveri, grave 36, male, accession number of the fibula AP 90: (273), 10th cent.	Fragment of a twill fabric, a fibula put into the fabric.	In the fabric – some hairs brownish blue, some black. Could have been blue.	Blue
106	(14) Visku Maskava, grave 35, female, A 9985: 2, 11th-12th cent.	Fragment of a tablet-woven band (3 tablets), weft of the same colour as the edges of the warp.	In the edges of the band – yellow or blue.	Yellow or blue
107			In the middle line of the band – brownish red hairs.	Red
<i>Jekabpils region</i>				
108	(15) Krustpils Oglenieki, grave 8, female, VI 3:79, 12th cent.	Fragments of two shawls, one with inwoven bronze rings. The other not ornamented – a fragment with a tablet-woven band on the edge (4 tablets: yellow, red, yellow, blue) and on the end (3 tablets: yellow, red, yellow, and fringes).	In the fabric – bluish and dark reddish brown.	Blue (or reddish-brown?)
109			In the tablet-woven band – red, the disintegrated hairs – dark gingery.	Red
110	(15) Krustpils Oglenieki, grave 9, female, VI 3: 86, 12th-13th cent.	Head ornament – 15 mm wide tablet-woven band from fine single yarn.	In the band – reddish orange-brown. Some fibres disintegrated – transparent.	Red
111	(16) Selpils Lejasdopeles, barrow I, grave 2, baby, VI 56: no accession number, 10th-13th cent.	Two fragments of a twill fabric.	In the fabric – some hairs blue, some degraded – yellow.	Blue
112	(16) Selpils Lejasdopeles, barrow I, grave 5, female, VI 56: no accession number, turn of the 12th-13th cent.	Fragment of a rather fine and dense fabric.	In the fabric – blue.	Blue
113		Fragment of a coarse twill fabric.	In the fabric – some blue hairs, some disintegrated – yellow.	Blue
114		Tablet woven band (6 (?) tablets: blue, red, blue, red, blue, red), warp falling apart.	In the tablet-woven band – blue.	Blue
115			In the tablet-woven band – orange-brown.	Red (or gingery?)
116	(16) Selpils Lejasdopeles, barrow I, grave 6, female, VI 56: no accession number, 12th-13th cent.	Fragment of a tartan shawl, only the woolen parts have survived.	In the woolen fabric – greenish blue, some hairs disintegrated – light green.	Blue



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117	(16) Selpils Lejasdopeles, barrow I, grave 6, female, VI 56: no accession number, 12th-13th cent.	Fragment of a fabric and a tablet-woven band (5 (?) tablets) attached to it.	In the tablet-woven band – greenish.	Blue (or greenish blue)
118			In the tablet-woven band – yellow.	Yellow
119			In the tablet-woven band – orange-red.	Red
120	(16) Selpils Lejasdopeles, barrow I, grave 6, female, VI56:46, 12th-13th cent.	Two fragments of a twill fabric.	In the fabric – dark greenish brown and blue (?) hairs.	Blue
121	(16) Selpils Lejasdopeles, barrow II, grave 1, girl, VI 56:48, 10th-13th cent.	Head ornament of a fabric and a decoration of tiny spirals threaded on woolen yarn.	In the fabric – red.	Red
122	(16) Selpils Lejasdopeles, barrow II, grave 17, female, VI 56:II:17, the second half of the 11th cent.	Fragment of a tablet-woven band, length ~ 40mm. Could have been a sash.	In the tablet-woven band – yellow.	Yellow
123			In the tablet-woven band – blue.	Blue
124	(16) Selpils Lejasdopeles, barrow II, grave 17, female, VI 56:208, the second half of the 11th cent.	Tablet-woven band attached to the edge of a shawl.	In the tablet-woven band – blue.	Blue
125			In the tablet-woven band – brownish red.	Red
126	(16) Selpils Lejasdopeles, barrow II, grave 17, female, VI 56:202, the second half of the 11th cent.	Head ornament, made of bronze rings and spirals threaded on plied yarn. Three sections of the “tale”, pendants added to the ends of the “tale”.	In the filling of the ornament – dark reddish brown.	Red
127			In the filling of the ornament – yellow.	Yellow
128			In the filling of the ornament – blue.	Blue
129	(16) Selpils Lejasdopeles, barrow II, grave 17, female, VI 56:II:17:8, the second half of the 11th cent.	Three fragments of plaited plied yarn. Inkle-woven ribbon (~ 32 warps).	In the plaited yarn – dark yellow-orange, one hair – red.	Red
130			In the inkle-woven ribbon – greenish blue-grey.	Blue
131			In the inkle-woven ribbon – yellow.	Yellow
132			In the inkle-woven ribbon – intense bright red.	Red



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133	(16) Selpils Lejasdopeles, barrow V, grave 1, male, VI 56:V:1: no accession number, 11th cent.	Fragment of a fabric found at the rings of the left hand.	In the fabric – one blue hair, in many places disintegrated fibres – light yellow or dark brownish.	Blue
134		Fragment of a fabric with a tablet-woven band, found over the rib cage.	In the tablet-woven band – reddish.	Red
135			In the tablet-woven band – yellowish.	Yellow
136		Fragment of a fabric, inwoven one bronze ring, a tablet-woven band attached to the fabric. Found over the belt.	In the fabric – dark blue-black.	Blue
137			In the tablet-woven band – blue (lighter and greener than the blue colour of the fabric).	Blue
138			In the tablet-woven band – greenish yellow.	Yellow
139			In the tablet-woven band – gingery.	Red
140	(16) Selpils Lejasdopeles, barrow V, grave 1, male, VI 56:V:1:40, 11th cent.	Fragment of a coarse twill fabric, used for wrapping female jewellery, placed by the feet.	In the fabric – dark blue.	Blue
141			In the tablet-woven band – yellow.	Yellow
142			In the tablet-woven band – brownish red.	Red
143	(16) Selpils Lejasdopeles, barrow V, grave 1, male, VI 56:V:1: no accession number, 11th cent.	Fragment of a twill fabric with a zigzag embroidered line of plied yarn. Found under two fibulas.	In the fabric – blue.	Blue
144			In the embroidery – brownish red.	Red
145		Fragment of a coarse twill fabric, stuck together with a fragment of a linen fabric. Found behind the belt.	In the wool fabric – blue.	Blue
146		Fragments of two fabrics, stuck together under the possible coffin lid. Found over a buckle, next to a fibula.	In the biggest fabric – brown.	Brown
147			In the smallest fabric – blue.	Blue
148		Fragment of a twill fabric with one edge. Found over the arm band and the belt.	In the fabric – brown, some hairs – brownish red, some hairs – black.	Brown
149	(16) Selpils Lejasdopeles, barrow V, grave 1, male, VI 56:312, 11th cent.	Fragment of the arm band, inwoven bronze rings.	In the fabric – blue.	Blue



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150	(16) Selpils Lejasdopeles, barrow V, grave 1, male, VI 56:338, 11th cent.	Remains of a decoration: four bronze spirals, plaited yarn and fringes.	In the fringes – orange-gingery.	Red (or gingery?)
151			In the fringes – intense bright yellow.	Yellow
152			In the fringes – dark greenish blue.	Blue (or greenish blue)
153			In the fringes – blue.	Blue
154	(16) Selpils Lejasdopeles, barrow V, grave 1, male, VI 56:339, 11th cent.	Four fragments of a fine fabric. Found over the arm band.	In the fabric – some yellowish hairs, some – blue.	Blue
<i>Latgale (eastern Latvia), place not specified</i>				
155	(17) Latgale, RDM IV 54 (CVVM 64929), 7th-13th cent.	Fragment of a twill fabric, 4 lines of 3 blue threads inwoven close to the edge of the fabric.	In the main parts of the fabric – brownish and yellowish hairs.	Brown
156			In the stripes – blue.	Blue
<i>Liepaja region</i>				
157	(18) Rucavas Geistauti, grave 1, female, A 9904: no accession number, 5th-6th cent.	Two fragments of coarse fabric. Found by the bracelets.	In the fabric – the thicker hairs – dark brown-violet, the disintegrated hairs – thin and yellowish.	Blue (or blue and brown)
158	(18) Rucavas Geistauti, grave 4, female, A 9907: no accession number, 5th-6th cent.	Fragment of a fine twill fabric. Found by the fibula.	In the fabric – the thicker hairs – dark brown-black-violet, the thinner hairs – pale greyish green.	Blue
159		Fragment of a fine twill fabric. Found over the bracelet.	In the fabric – the thicker hairs – dark brownish violet, the thinner hairs – light red-orange.	Blue ?
160	(18) Rucavas Geistauti, grave 4, female, accession number of the pin A 9907: 7, 5th-6th cent.	Single yarn twisted round the pin.	In the yarn – red of a cool tone, one hair – bright red.	Red
161	(18) Rucavas Geistauti, grave 17, female, A 9920: 3, 6th cent.	Small fragments of a fabric. Found by the fibula.	In the fabric – most of the fibres – dark brownish violet, some hairs – reddish, some thinner hairs – yellowish transparent.	Un-identifiable
162	(19) Rucavas Mazkatuzi, grave 18, male, A 9948: no accession number, 3th-4th cent.	Fragment of a fabric, found over a bracelet.	In the fabric – part of the fibres – dark brown (or blue), part – disintegrated, very thin and yellow.	Un-identifiable



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163	(19) Rucavas Mazkatuzi, grave 24, female, A 9953: no accession number, 3th-4th cent.	Two fragments of a twill fabric, fulled. Found over the fibulas.	In the fabric – part of the fibres dark brown (greyish gingery), some hairs disintegrated, thin and yellow.	Brown
164	(20) Rucavas Tiras bog hoard, male, A 9170:13a, 9th cent.	Fragment of a coarse plain weave fabric.	In the fabric – brown.	Brown
165	(20) Rucavas Tiras bog hoard, male, A 9170:13b, 9th cent.	Fragment of a coarse plain weave fabric, one end hemmed. With a naked eye – brown with 3 darker stripes of 6 warps close to the edge.	In the main parts of the fabric – orange.	Brown
166			In the stripes – dark brownish red.	Brown
167	(20) Rucavas Tiras bog hoard, male, A 9170:15, 9th cent.	Fragments of leg wraps, fine herringbone twill, width – 13 cm. With a naked eye – dark brown.	In the fabric – some fibres darker, brownish red, some fibres – lighter, orange-brown.	Brown
<i>Ludza region</i>				
168	(21) Ludzas Odukalns, female, RDM IV119a; b, 11th cent.	Head ornament, made of bronze rings and spirals threaded on plied yarn.	In the filling of the ornament – gingery.	Red
169			In the filling of the ornament – blue.	Blue
170	(22) Pildas Nuksi, grave 119, female, CVVM 65365:1 and 2, 11th cent.	Fragments of a twill fabric, inwoven bronze spirals.	In the fabric – dark blue-black, some hairs – dark brown.	Blue
171	(22) Pildas Nuksi, grave 185, female, CVVM 65426: 1, 10th cent.	Head ornament, made of bronze rings and spirals threaded on plied yarn. Yarn very well preserved.	In the filling of the ornament – blue, some hairs – bright blue.	Blue
172			In the filling of the ornament – reddish, turned paler and more yellow. Could have been bright red.	Red
173	(22) Pildas Nuksi, grave 197, male, CVVM 65437: 7 and 8, 10th-beginning of the 11th cent.	Fragment of a twill fabric with a hemmed edge. Decoration made of some bronze spirals attached to the fabric with a plied yarn. Possibly a coat.	In the fabric – dark blue-violet.	Blue
174			In the yarn of the decoration – reddish, turned more brownish.	Red
175	(22) Pildas Nuksi, grave 198, male, no accession number, 10th-11th cent.	Two small fragments of a twill fabric. Possibly an outer garment.	In the fabric – some hairs reddish brown, some – disintegrated and unidentifiable.	Brown ?
176	(23) Zvirgzdenes Kivti, grave 4, female, A 9591:24, ~year 700.	Two fragments of a shawl, a twill fabric, inwoven bronze rings.	In the fabric – some hairs dark blue-black, some light yellow-brown.	Blue



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177	(23) Zvirgzdenes Kivti, grave 128, male, no accession number, 8th cent.	Fragment of a fine inkle-woven ribbon. Possibly an arm band. Damaged in the process of restauration.	In the inkle-woven ribbon – brownish red.	Red
178			In the inkle-woven ribbon – bluish.	Blue ?
179	(23) Zvirgzdenes Kivti, 171, female, no accession number, 8th-12th cent.	Fragment of an inkle-woven ribbon. Possibly a sash.	In the inkle-woven ribbon – dark greyish blue-black.	Blue
180			In the inkle-woven ribbon – some parts bright red.	Red
<i>Madona region</i>				
181	(24) Dzelzavas Strugukalns, grave 3, female, A 8313:1, 13th cent.	Fragment of a fabric.	In the fabric – light yellowish brown, no darker hairs.	Brown ?
182	(24) Dzelzavas Strugukalns, grave 3, female, A 8313:2, 13th cent.	Fragment of a shawl (?) – a fabric with a tablet-woven band and fringes.	In the fabric – dark blue-black.	Blue
183			In the tablet-woven band – yellow.	Yellow
184			In the tablet-woven band – reddish-brown.	Red
185	(25) Galgauska, stray find, female, RDM I 3664, 13th cent.	Fragment of a shawl, a fabric with a tablet-woven band and decorative lines of yellow glass beads. With a naked eye – blue.	In the fabric – brownish hairs, fibres disintegrated, unidentifiable.	Un-identifiable
186			Fragment of a plain weave fabric. With a naked eye – blue.	Blue
187	(25) Galgauska, stray find, female, RDM I 3666, 12th cent.	Two fragments of a shawl, inwoven bronze rings, a tablet-woven band (11 tablets) attached to the fabric.	In the fabric – blue.	Blue
188			In the tablet-woven band – blue.	Blue
189			In the tablet-woven band – red, two hairs bright red (slightly cool tone), others – more reddish-brown/gingery.	Red
190			In the tablet-woven band – yellowish.	Yellow
191			In the tablet-woven band – orange-gingery.	Gingery (red?)
192	(25) Galgauska, stray find, female, RDM I 3668, 12th cent.	Fragment of a shawl, a fabric with inwoven rings, a tablet-woven band attached to the edge of the fabric. The unravelled stretch of the band has been coarsely mended with a blue twisted yarn.	In the fabric – blue.	Blue
193			In the fringes – red.	Red
194			In the fringes – reddish-brown.	Gingery (red?)



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195	(26) Liezeres Ozolmuiza, stray find, RDM I 3717, 13th-14th cent.	Fragment of a reps (?) fabric, embroidery along the edge, an inkle-woven ribbon sewn to the fabric with a plied yarn. With a naked eye – bluish fabric, ribbon – blue, red, yellow.	In the fabric – dark reddish brown disintegrated hairs, colour unidentifiable.	Un-identifiable
196			In the line of embroidery – light orange.	Red (or gingery)
197			In the inkle-woven ribbon – blue.	Blue
198			In the inkle-woven ribbon – orange-red.	Red
199			In the inkle-woven ribbon – yellow.	Yellow
200			In the yarn used for sewing – blue.	Blue
201			Fragment of a diamond twill (?) fabric.	In the fabric – dark blue.
202	(27) Lubanas Licagals, grave 1, male, A 4954, 12th-13th cent.	Fragment of a twill fabric, a fibula put into the fabric. Possible a coat or a cape.	In the fabric – fibre poorly preserved, some darker brownish-red hairs, disintegrated hairs – dim light yellow.	Un-identifiable
203	(28) Meirani, female, RDM I: 3648, 12th- 13th cent.	Four fragments of an inkle-woven ribbon made of fine plied yarn.	In the inkle-woven ribbons – reddish, fibre poorly preserved.	Red
204			In the inkle-woven ribbons - bluish, fibre poorly preserved.	Blue
205		Fragments of a shawl, a twill fabric with a 2 cm line of reps on the end.	In the fabric – dark greyish, black.	Blue?
206		Fragment of a tablet-woven band (5 tablets), three colours, the same colours in the fringes (the blue fringes covered by the line of the red and the yellow fringes).	In the tablet-woven band – reddish, some hairs colourless.	Red
207			In the tablet-woven band – yellow, has become darker.	Yellow
208			In the tablet-woven band – blue, some hairs colourless.	Blue
209		(29) Patkule, grave 1, male, A7981: no accession number, 12th cent.	Fragment of a fabric. Found under the buckle of the belt. Possibly a coat.	In the fabric – yellowish brown, some hairs – dark.
210	(30) Saikava, grave 1, male, A10165:3, 11th cent.	Fragment of a fulled twill fabric, a fibula put into the fabric.	In the fabric – blue.	Blue
211	(30) Saikava, grave 1, male, A10165:6, 11th cent.	Fragment of a fabric, stuck to the bronze decorations of the belt.	In the fabric – light yellowish brown.	Brown



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212	(31) Tirzas Zvanulejas, stray find, male, A 9736:5, 11th- 12th cent.	Fragment of a twill fabric.	In the fabric – very dark brown-black and blue hairs, possibly used to be blue.	Blue
213	(32) Viesienas Kalnadzisli, stray find, male, A 8074: 2, 14th cent.	Small fragment of a fabric with a button and a leather strip attached to the fabric.	In the fabric – several hairs have a bright light blue (slightly greenish-blue) gloss.	Blue
214	(32) Viesienas Kalnadzisli, stray find, male, A 8074: 6, 14th cent.	Fragments of a fulled fabric of a coat.	In the fabric – dark gray-blue, some hairs – greenish-blue.	Blue
<i>Rezekne region</i>				
215	(33) Ezernieku Jurkova, grave 1, female, A12078:3, 13th cent.	Tablet-woven band, sewn to the fabric of a shawl with a red plied yarn.	In the tablet-woven band – dark yellow.	Yellow
216			In the tablet-woven band – dark reddish brown-orange.	Red
217			In the tablet-woven band – dark blue-black.	Blue
218	(34) Vidsmuizas Zeimuli, trench 1, grave 2, male, A 12009: no accession number, 9th cent.	Small fragments of a plain weave fabric, stuck to the coffin (?).	In the fabric – dark blue-black hairs, well-preserved colour.	Blue
219	(34) Vidsmuizas Zeimuli, trench 6, grave 6, female, A 12009: 72, 11th cent.	Fragments of a shawl, a twill fabric with inwoven bronze rings.	In the fabric – dark bluish-green-black, some hairs disintegrated (yellowish).	Blue
220	(34) Vidsmuizas Zeimuli, trench 6, grave 6, female, A 12009: 71, 11th cent.	Remains of a head ornament: some spirals threaded on plied yarn and bast, bast wrapped in yarn, a tassel of fringes with two cowries attached.	In the fringes – reddish, orange, brownish hairs, some darker, some more red.	Red
<i>Riga region</i>				
221	(35) Riga castle, trench B (2008), 13th-14th cent.	Fragment of a very coarse plain weave fabric.	In the fabric – parts of fiber – orange and orange-brown, some purple; disintegrated hairs – light yellow.	Brown
222	(36) Katlakalna Plavniekkalns, grave 8, female, no accession number, 5th-6th cent.	Fragments of a twill fabric, the largest piece found over the neck ring, in some places in two layers.	In the fabric – in some places disintegrated fibres – thin, transparent yellow hairs, some hairs – gingery. Possibly was reddish brown.	Brown
223	(36) Katlakalna Plavniekkalns, grave 27, female, RDM I 222 G, 12th-13th cent.	Remains of a head ornament – plied yarns and bronze spirals. Yarns possibly form a tablet-woven band.	In the yarn – orange-reddish hairs, a little disintegrated. Most likely used to be red.	Red



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224	(36) Katlakalna Plavniekkalns, stray find, RDM I 3689 / 90, 12th- 13th cent.	Fragments of textiles: a tablet-woven band, fragment of a shawl, part of a head ornament with a decoration of tiny bronze spirals and yellow glass beads.	In the head ornament – reddish.	Red
225	(36) Katlakalna Plavniekkalns, stray find, A: 6799, 5th-6th cent.	Three small fragments of fabric, bronze spirals stuck to two of the textile fragments.	In the fabric – disintegrated fibres, unidentifiable colour.	Un-identifiable
226	(37) Madliena, stray find, female, no accession number, 13th cent.	Tablet-woven band with fringes attached to the end of a shawl.	In the tablet-woven band – dark blue-black.	Blue
227			In the tablet-woven band – reddish-brown.	Red
228			In the tablet-woven band – bright yellow.	Yellow
229	(38) Plavinu Kalniesi II, grave 23, male, A 11272:1, 8th cent.	Fragment of a head covering, possibly a cap.	In the fabric – dark greenish-gray brown.	Brown
230	(38) Plavinu Kalniesi II, grave 23, male, A11272:2, 8th cent.	Fragment of a fabric, found under the owl-shaped fibula.	In the fabric – dark blue or dark greenish-gray.	Blue (or greenish-blue?)
231	(39) Plavinu Radzes, grave 32, male, VI 85:163, the second half of the 10th cent.	Fragment of a head covering (possibly fur), decorated with bronze spirals that are threaded on plied yarn.	Yarn through the spirals – medium light brown.	Brown
232	(39) Plavinu Radzes, 32, male, VI 85: three of the samples, the second half of the 10th cent.	Fragment of a twill fabric. Possibly a cover of the burial.	In the fabric – unidentifiable colour.	Un-identifiable
233	(39) Plavinu Radzes, grave 32, male, VI 85:187, the second half of the 10th cent.	Many small fragments of a coat, inwoven bronze rings. Disintegrated fabric, one fragment of the fabric better preserved.	In the better preserved fabric – blue.	Blue