THE STRUCTURE OF ARCHAEOLOGICAL TEXTILES FROM THE EARLY AND HIGH MIDDLE AGES IN FINDS FROM THE CZECH REPUBLIC (PART 1)

Helena Březinová, Milena Bravermanová and Jana Bureš Víchová

Institute of Archaeology of the Czech Academy of Sciences, Prague, Czech Republic <u>www.arup.cas.cz</u>, <u>brezinova@arup.cas.cz</u>, <u>milena.bravermanova@seznam.cz</u>, <u>JVichova@seznam.cz</u>

Abstract: Textile production has deep roots in the past, and knowledge of the processing and use of textile fibres can be assumed since the Stone Age. Over the centuries, textile production has constantly improved and a range of raw materials and textile bindings have been used. In archaeological finds we rarely encounter the remains of fragile textile material; however, it is possible to reconstruct the level, maturity and variety of textile structures in the past, above all from small discovered fragments, most often from burial or waste features. The article provides an overview of weaves, their characteristics and specific examples identified in preserved textiles from archaeological finds in the Czech Republic dating to the period from the Early to the Late Middle Ages.

Keywords: archaeological textiles, weave, Early Middle Ages, High Middle Ages, Prague Castle

1 INTRODUCTION

The investigation and professional processing of textile preserved in archaeological contexts provides an unique opportunity for learning about the method, level and diversity of textile production in the past. Although the Czech Republic lacks ideal conditions for the preservation of organic archaeological material, find units, mainly grave and waste situations, occasionally provide textiles from various time periods. A major part of the investigation of textiles is the study of weaves and the method of their creation. The following article provides a summary of all weaves documented on textiles obtained from archaeological finds in the Czech Republic in the period between the Early and Late Middle Ages. The work presents basic weaves such as tabby, twill, satin and their extended versions, as well as more intricate and very complicated weaves such as those with floating weft threads, damask, weft-faced compound twill, proto-lampas, lampas and velvet¹. The selection of specific examples includes both classic variants of individual weaves and variants with certain differences or interesting aspects in their execution. The presented fabrics produced with simple or very complicated weaves are part of the broad spectrum of medieval textile production that achieved, especially in the production of silk fabrics, a high utility, economic and artistic value.

2 SOURCE INVENTORY

The remains of medieval textiles appear in archaeological finds from various environments, with the most frequent being waste pits and features from

medieval urban environments where higher moisture and a lack of air create ideal conditions for the preservation of organic material and which generate remnants of common material culture used in medieval households. An important group of textile finds that has been particularly useful for the study of more complicated weaves, period fashion, styles, patterns and trade with luxury fabrics is grave textiles preserved in enclosed graves and tombs connected most frequently with the royal, aristocratic and Church environment, in many cases with a concrete historical figure. Also offering good conditions for the preservation of textiles are find environments supported by the regular circulation of air, including the backfill of vaults and floors in historical buildings. Another source for studying textiles is small fragments preserved in the corrosion surface layers of metal artefacts; these finds, especially those from the Early Medieval period, provide a unique opportunity for the investigation of textile structures [1].

Specific fabrics representing individual weaves were selected in three types of find environments significant for archaeological textile finds in the Czech Republic. Medieval textiles from waste features and layers make up an assemblage of more than 1500 textile fragments from the thick waste layers from the 14th and 15th centuries in the centre of Prague [2]. Funeral textiles were chosen from a unique collection from archaeological excavations at Prague Castle, especially from St. Vitus Cathedral, the resting place of the Bohemian rulers, their family members and Church dignitaries [3, 4]. An example of Early Medieval textiles preserved in the corrosion

layers of metal artefacts is finds from Great Moravian inhumation graves in Mikulčice [5].

The study of weaves is connected with the development of individual types of looms of various constructions. We focus exclusively on those that were used to make the fabrics documented in Czech territory. The simplest type was the warp-weighted loom, the use of which appears in prehistoric times and in Europe is regarded as the main weaving device up until the Early Medieval period. The loom was composed of two uprights, a warp beam with tied warp threads and the cloth beam. The warp threads were typically tightened by a set of weights. The shedding device was composed of a certain number of shed rods with heddles that raised the warp threads, and by moving the individual shed rods forwards and backwards, a shed was created for passing the weft through. The weaver operated the loom from the front while standing. The simplest fabrics with tabby and twill weaves were woven on this type of loom.

During the course of the 13rd century, the warpweighted loom was gradually replaced in the Czech environment by the more technically advanced horizontal treadle loom. The invention of this type of loom is attributed to China in the 2nd century BC. Its use then expanded westward, and by the Early Middle Ages, the horizontal treadle loom could also be found in Europe. The loom was composed of a wooden frame with four uprights and cross beams. Two rollers were attached to the front and back uprights - in the front by the weaver was a cloth roller onto which the finished fabric was wound. In the back was the warp roller to which the warp threads were attached and wound. The most important part of the loom was the shedding mechanism composed of two or more heddle bars, two or more treadles, the heddle harness and the beater. The bottom of each heddle bar was attached by rope to the treadle, which the weaver operated by foot. The shed was created by alternately pushing and releasing the treadles. A two-person horizontal loom operated by two weavers was used to weave exceptionally wide fabrics. This type of loom was used to produce tabby, twill and satin weaves.

The use of the most complicated weaving device in period textile production, the drawloom, began roughly in the 3rd century in the eastern Mediterranean. It was used to produce patterned fabrics, mainly from silk. It developed as a refinement of the horizontal loom and was equipped with a special type of figure harness consisting of lashes controlled by lifting cords. This device was operated by a drawboy sitting opposite the weaver on a raised seat. The drawloom permitted the continual repetition of a pattern in the width and length of the textile. Decorative motifs stood out more because it was possible to work better with the pattern wefts. Drawlooms were used to produce, for

example, more complicated weft-faced compound twill, proto-lampas and lampas [6].

Velvet without a pattern was woven on a horizontal loom, and thin metal rods were inserted in the fabric a certain intervals. Loops formed above the ground fabric once the rods were removed. If these rods had a longitudinal channel along which a sharp tool could be run, the loops were cut to create cut velvet. In the case of patterned velvet, pile warps were controlled by a special type of figure harness. If another pattern occurred in the fabric, e.g. woven with metal wefts, a second figure harness was required for work with the warp threads [7].

3 TABBY

Tabby (plain weave) is a weave based on a unit of two ends and two picks in which each end passes over and under one pick, with the points of binding being set over one end on successive picks. It is the simplest and densest weave and has the same appearance on the obverse and reverse sides of the fabric. The tabby weave is the most commonly documented weave, from the earliest prehistoric textile finds in Europe, including in the Czech Lands [9], up to the studied medieval period, where, in all investigated find units with the exception of assemblages of luxury silk textiles from Prague Castle, it significantly exceeds the occurrence of all other weaves [2, pp. 66-68].

3.1 Wool fabric [2, p. 318]

Find circumstances: Prague 1 – New Town, waste layer Storage; inventory number: The City of Prague Museum; 25_A11E_347 Dating: 14th – 15th century

Provenance: Bohemia Technical analysis (Figure 1)



Figure 1 Wool fabric: weave diagram

Weave	: tabby	
Warp	wool, z-twist, light brown colour ²	
	count: 13 threads per cm	
Weft	wool, s-twist, light brown colour	
	count: 13 threads per cm	
Characteristics of the weave: regular		
Pattern: unpatterned		
Original use: indeterminable		

3.2 Crepe fabric [10]

Find circumstances: Prague Castle, St. Vitus Cathedral, Royal crypt, originally the separate coffin of one of the following queens: Blanka of Valois (†1348), Anne of Bavaria (†1353), Anna of Schweidnitz (†1362), Joanna of Bavaria (†1386), Elizabeth of Pomerania (†1393), as of 1611 a common coffin for all the queens

Storage; inventory number: Prague Castle collection; PHA 4/04, HS 25802

Dating: 14th century Provenance: Spain (?)

Technical analysis (Figure 2)



Figure 2 Crepe fabric: detail of fabric with hem © Prague Castle Administration, photo: J. Gloc

Weave: tabby

- Warp silk, z-twist, ochre-brown colour count: c. 60 threads per cm
- Weft silk, z-twist, ochre-brown colour count: c. 60 threads per cm

Characteristics of the weave: warp and weft threats are very wavy (crepe), an effect achieved by means of a relatively high identical z-twist in the warp and weft threads; both edges of the strip of fabric have a decorated waviness, the result of the use of thicker, mostly paired, and weakly spun warp threads in the hem

Pattern: unpatterned

Original use: a typical medieval woman's veil, a so-call 'kruseler'

4 TWILL

Twill is a weave based on a unit of three or more ends and three or more picks, in which each end passes over two or more adjacent picks and under the next one or more, or under two or more adjacent picks and over the next one or more. The points of binding are set over by one end, always in the same direction, on successive picks forming diagonal lines. The repetition of a twill may be expressed as a numerical ratio, with the first figure indicating the number of picks over which an end passes, the second the number of picks under which it passes.

Like the tabby weave, the twill weave is documented in finds dating back to prehistoric times. Both weaves appear in great numbers in assemblages connected with the common textile material culture of the medieval population [2, pp. 66-67].

4.1 Worsted fabric [2, p. 305]

Find circumstances: Prague 1 – New Town, waste layer Storage; inventory number: The City of Prague Museum; 10_V31_83 Dating: $14^{th} - 15^{th}$ century

Provenance: western Europe (?), Bohemia (?) Technical analysis (Figure 3a, b)



Figure 3 Worsted fabric: a) weave diagram; b) fabric detail © Z. Kačerová

Weave	: 2.2 twill
Warp	worsted wool, z-twist, light brown colour
•	count: 22 threads per cm
Weft	worsted wool, z-twist, light brown colour
	count: 16 threads per cm
Charac	teristics of the weave: regular
Patterr	: unpatterned
Origina	l use: indeterminable

5 EXTENDED TABBY AND TWILL

An extended weave is created from a ground tabby, twill or satin weave by adding or removing certain binding points or through another arrangement of threads, thus producing a new binding of the ground weave.

5.1 Chequered fabric [11]

Find circumstances: Prague Castle, St. Vitus Cathedral, Royal crypt, perhaps the Romanesque chest apparently used to transport the remains of Conrad II Oto, Duke of Bohemia (†1191)

Storage; inventory number: Prague Castle collection; PHA 95/02, HS 25829

Dating: 12th century (?)

Provenance: Spain, southern Europe (?)

Technical analysis (Figure 4a, b)

Weave: 2.2 extended tabby (louisine), 2.2.3. extended tabby (louisine), 3.1.1.1.1. weft-faced twill S, 3.1.1.1.1. weft-faced chevron twill in the warp direction, 3.1.1.1.1. weft-faced chevron twill in the weft direction, 3.1.1.1.1. weft-faced lozenge twill

Warp silk, z-twist, ochre-brown colour count: c. 50-77 threads per cm
 Weft *latté*, silk, without visible twist, light brown and green colour count: c. 20-35 threads per cm

Characteristics of the weave: combination of several simple weaves that continually alternate

Pattern: the fabric (*etoffe à carreaux*) is decorated across the entire preserved width with a small geometric pattern of diamonds, zigzags and crosswise and lengthwise stripes achieved with a combination of several simple weaves; the chequered pattern is further enhanced by the use of different colours of weft threads

Pattern rapport: indeterminable

Original use: possible wrap for the relics of Conrad II Oto, Duke of Bohemia



Figure 4 Chequered fabric: a) weave diagram: I. – 2.2 extended tabby; II. – 2.2.3 extended tabby; III. – 3.1.1.1.1 weft-faced twill S; IV. – 3.1.1.1.1 weft-faced chevron twill in the warp direction; V. – 3.1.1.1.1 weft-faced chevron twill in the warp direction; V. – 3.1.1.1.1 weft-faced chevron twill in the warp direction; VI. – 3.1.1.1.1 weft-faced lozenge twill; b) fabric detail © Prague Castle Administration, photo: J. Gloc

5.2 Fabric with stylised diamond mesh [12]

Find circumstances: Prague Castle, St. Vitus Cathedral, Royal crypt, lining of the Romanesque chest apparently used to transport the remains of Conrad II Oto, Duke of Bohemia (†1191)

Storage; inventory number: chest – National Museum; fabric sample – Prague Castle collection; PHA 95/03 Dating: second half of the 12th century (?)

Provenance: Spain (?)

Technical analysis (Figure 5)



Figure 5 Fabric with stylised diamond mesh: weave diagram

Weave: interconnection of 3.1 twill S and 3.1 twill Z

- Warp flax, z-twist, brown-red colour count: 23 threads per cm
- Weft cotton, without apparent twist, brown-red colour count: 13 threads per cm

Characteristics of the weave: patterned twill; several binding points not realised; weave unit 12/12

Pattern: stylised diamond mesh in which stripes falling obliquely from the right to the left are divided by double bars into rectangular fields containing small rectangles Pattern rapport: height 2 cm, width 2 cm

Original use: lining of Romanesque chest

6 WEAVES WITH FLOATING WEFT THREADS

The pattern of this type of fabric is composed of either a floating ground weft or one of the weft threads in a standard weave (double-faced weave; see 6.1.), or a supplementary floating weft is added to the weft thread – pattern or brocading – regularly bound by the warp (see 6.2.).

6.1 Fabric with diamonds [12]

Find circumstances: Prague Castle, St. Vitus Cathedral, graves of the Prague bishops, probably Bishop Nikolaus (†1258)

Storage; inventory number: Church treasury at St. Vitus (held by the Prague Castle Administration); K 434

Dating: first half of 13th century

Provenance: Spain, southern Europe (?)

Technical analysis (Figure 6a, b)

Weave: tabby with floating weft (double-faced weave)

Warp silk, z-twist, light brown colour

count: c. 27-28 threads per cm

Weft silk, without visible twist, light brown colour count: c. 19-21 threads per cm

Characteristics of the weave: even wefts float on the face, odd wefts on the reverse; floating wefts over 3-13 warps

Pattern: small, constantly repeating diamonds, with each larger diamond containing another smaller diamond Pattern rapport: height 1.8 cm, width 5.7 cm Original use: remnant of burial gown, possibly a dalmatic



Figure 6 Fabric with diamonds: a) weave diagram; b) fabric detail © Prague Castle Administration, photo J. Gloc

6.2 Fabric with a supplemental pattern weft [13]

Find circumstances: Mikulčice-Kostelisko, grave no. 2041, small fabric fragments preserved in the corrosion layer of an iron sword in its scabbard

Storage; inventory number: Institute of Archaeology of the Czech Academy of Sciences, Brno; 266/114

Dating: 9th century

Provenance: ?

Technical analysis (Figure 7a, b)

Weave: tabby with a supplemental pattern weft

- Warp flax, z-twist, brown colour count: c. 25 threads per cm
- Weft proportion (pass): 1 ground weft to 1 pattern weft - ground: flax, z-twist, brown colour
 - pattern: flax, S/2z, brown colour count: 20 threads per cm (ground weft),
 - 20 threads per cm (pattern weft)

Characteristics of the weave: a tabby weave with one supplementary floating pattern weft whose short floats, always across two warp threads, create a small geometric pattern on the fabric obverse; weave unit 20/16 (8+8) Pattern: diagonal rows of disarrayed diamonds Pattern rapport: height 0.4 cm, width 0.8 cm Original use: part of the inner lining of a wooden sword scabbard



Figure 7 Fabric with supplemental patterning weft: a) weave diagram; b) reverse of mineralised fabric © Institute of Archaeology of the Czech Academy of Sciences, Brno

7 SATIN

Satin is a weave based on a unit of five or more ends and a number of picks equal to, or a multiple of, the number of ends. Each end either passes over four or more adjacent picks and under the next one, or passes under four or more adjacent picks and over the next one. The points of binding are set over two or more ends on successive picks.

This weave appeared in China in the 9th century and later also gained popularity in central Asia, the Near East and in Egypt, where it was used in the ground of lampas fabrics. It doesn't appear in European silk production until the end of the 13th century, and the use of this weave increases in the following century. Satin's occurrence on wool fabrics in European assemblages from the 14th century is very rare, and it isn't until the 15th century that the weave appears more frequently [2, pp. 88, 91].

7.1 Silk fabric [2, p. 333]

Find circumstances: Prague 1 – New Town, waste layer Storage; inventory number: The City of Prague Museum; 40_B5_69

Dating: 14th – 15th century

Provenance: western, southern Europe (?)

Technical analysis (Figure 8a, b)

Weave: 5-end warp-faced satin

Warp silk, z-twist, brown colour count: 95 threads per cm

Weft silk, without visible twist, brown colour count: 36 threads per cm

Characteristics of the weave: interruption 2 Pattern: unpatterned

Original use: indeterminable





Figure 8 Silk fabric: a) weave diagram; b) fabric detail © Z. Kačerová

b)

8 DAMASK

Damask is a figured textile with one warp and one weft in which the pattern is formed by a contrast of binding systems. In its classic form, it is reversible, and the contrast is produced by the use of the warp and weft faces of the same weave.

Damask in twill weaves appeared in the east Mediterranean and the Near East sometime in the 3rd-4th century, in China much earlier. From sometime in the 7th century the production of this type of damask became very important in China, whereas its popularity in the west declined. Thanks to trade on the renewed Silk Road, damask expanded westward again from the end of the 12th century; it was woven primarily in Syria and Egypt. Damask fabric in a satin weave was also produced in China beginning in the 13th century [14, 15].

8.1 Fabric with a plant pattern [2, pp. 294, 347]

Find circumstances: Prague 1 – New Town, waste layer Storage; inventory number: The City of Prague Museum; 1_V31_82; 1_V31_280; N_R3_58 Dating: 14th century Provenance: China Technical analysis (Figure 9a, b)





Figure 9 Fabric with plant pattern a) weave diagram: I. – ground; II. – pattern; b) fabric detail © Z. Kačerová

Textile type: damask

Warp	silk. no visible twist. brown colour
	découpure: 1 warp
	count: 65 threads per cm
Weft	silk, no visible twist, brown colour
	découpure: 1 weft
	count: c. 60 threads per cm

Characteristics of the weave: ground – warp-faced 2.1 twill Z; pattern – weft-faced 1.2 twill S

Pattern: rising in the warp direction are parallel and very wide wavy lines in the form of stylised tendrils with shoots and leaves reminiscent of lotus flowers; the space between the ornamentation is filled with a small geometric pattern Pattern rapport: height 7 cm, width 4.5 cm

Original use: indeterminable

9 WEFT-FACED COMPOUND TWILL

Weft-faced compound twill is a weave employing a main warp, a binding warp, and a weft composed of two or more series of threads, usually of different colours. By the action of the main warp ends, only one weft thread appears on the face, while the other or others are kept to the reverse. The ends of the binding warp bind the weft in passes in twill, and the ground and the pattern are formed simultaneously. The entire surface is covered by weft floats that hide the main warp ends.

Weft-faced compound twill first appeared in Persia roughly in the period of 300-500. The oldest fabric woven in this manner has a ratio of one main warp thread to one binding warp thread. In the Near East and the Byzantine Empire, weft-faced compound twill was later made in a ratio of two main warp threads to one binding warp thread, a weave that spread towards Central and Eastern Asia, with Arabs to the west across the Mediterranean to southern Spain. The greatest expansion of weft-faced compound twill dates to around the year 1000; the fabric also occurred in the 12th century before fading from use in the 14th century [14, 16].

9.1 Fabric with lions [2, p. 294]

Find circumstances: Prague 1 – New Town, waste layer Storage; inventory number: The City of Prague Museum; 1_V31_80_

- Dating: 13th century
- Provenance: Spain
- Technical analysis (Figure 10a, b)
- Weave: 1.2 weft-faced compound twill
- Warp proportion: 2 main warps to 1 binding warp
 main: silk, no visible twist, yellow colour
 binding: silk, no visible twist, yellow colour
 count: 24 threads per cm (main warp),
 - 12 threads per cm (binding warp) découpure: 1 main warp

Weft proportion (pass): 3 wefts

- I. *latté*: silk, no visible twist, yellow colour
- II. Interrompu: silk, no visible twist, yellow colour
- III. *Interrompu*: probably a strip from silver- plated and gold-plated animal substrate
 - wound around a flax core;
 - preserved in minute remnants

count: c. 24 passes per cm

découpure: 1 pass

Characteristics of the weave: weft-faced compound twill with three weft series; binding warp interlaces in 1.2 twill S in passes

Pattern: only part of the pattern with a pair of sitting lions with their backs to one another have been preserved

Pattern rapport: indeterminable

Original use: indeterminable



Figure 10 Fabric with lions: a) weave diagram: I. – effect of weft I.; II. – effect of weft II.; III. – effect of weft II.; b) fabric detail @ Z. Kačerová

9.2 Fabric with birds in medallions [17]

Find circumstances: Prague Castle, St. Vitus Cathedral, Royal crypt, perhaps the Romanesque chest apparently used to transport the remains of Conrad II Oto, Duke of Bohemia (†1191)

Storage; inventory number: Prague Castle collection; PHA 95/01, HS 12038

Dating: second half of the 12th century Provenance: Sicily Technical analysis (Figure 11)



Figure 11 Fabric with birds in medallions: a) weave diagram: I. – effect of weft II.; II. – effect of weft III. or IV.; III. – effect of weft V.; fabric detail © Prague Castle collection, J. Gloc

Weave: 1.2 weft-faced compound twill Warp proportion: 2 main warps to 1 binding warp - main silk, z-twist, ochre colour - binding silk, z-twist, ochre colour découpure: 2 main warps count: 40-48 threads per cm (main warp), 20-24 threads per cm (binding warp)

- Weft proportion (pass): 5 wefts
 - I. silk, no visible twist, ochre colour
 - II. silk, no visible twist, ochre colour
 - III. brocading: silk, no visible twist,
 - IV. brocading: silk, no visible twist,

red-pink colour

- V. brocading: gold-plated animal substrate wound around a silk core (Z twist, ochre colour), assembly Z, *couvert* (?)

count: 26-35 passes per cm

découpure: 1 pass

Characteristics of the weave: weft-faced compound twill with five weft series; binding warp interlaces in 1.2 twill S in passes; weft I. remains on reverse, weft II. on the obverse forms the background of the pattern; the pattern is composed of three brocading wefts

Pattern: the round medallions from two lines are filled with pearl roundel with the Tree of Life with cordate leaves; two birds with their bodies facing away from each other and the heads turned towards one another stand in front of the tree; there are four small stars in the space between individual medallions

Pattern rapport: indeterminable

Original use: possible wrap for the relics of Conrad II Oto, Duke of Bohemia

10 REFERENCES

- Bravermanová M., Březinová H., Urbanová K.: Metodika výzkumu archeologických textilních nálezů (Methodology of Research of Archaeological Textile Finds), Zprávy památkové péče 71(2), 2011, pp. 97-104
- Březinova H., Kohout D., Bravermanová M., Otavská V., Selmi Wallisová M.: Středověké textilní a barvířské technologie. Soubor textilních fragmentů z odpadních vrstev z Nového Města pražského (Medieval Textiles and Dyeing Technologies. An Assemblage of Textile Fragments from the Waste Layers of Prague's New Town), Institute of Archaeology of the CAS, Praha, 2016
- Bravermanová M., Lutovský M.: Hroby a hrobky našich knížat, králů a prezidentů (The graves and tombs of our princes, kings, and presidents), Praha, 2007
- Bravermanová M.: Pražský hrad jako pohřebiště lucemburské dynastie (Prague Castle as the burial site of the Luxembourg dynasty), In: Koruna království, Katedrála sv. Víta a Karel IV (The Crown of the Kingdom, Charles IV and the Cathedral of St. Vitus) Bravermanová M., Chotěbor P. (Eds.), Praha, 2016, pp. 78-114
- 5. Březinová H.: Finds of textile fragments and evidence of textile production at a major excavation site of the

The Part 2 will be published in the next issue.

Great Moravia in Mikulčice (South Moravia, Czech Republic). In NESAT XI. The North European Symposium for Archaeological Textiles, Banck-Burges J., Nübold C. (Eds.), Verlag Marie Leidorf (Rahden/Westfalen), 2013, pp. 193-196

- Broudy E.: The Book of Looms, Hanover London, 1979
- Peter M.: A Head Start through Technology: Early Oriental Velvets and the West, In: Oriental Silks in Medieval Europe, Fircks J., Schorta R. (Eds.), Riggisberger Berichte 21, Abegg-Stiftung, Bern, 2016, pp. 300-315
- 8. CIETA: Vocabulary of Technical Terms, Lyon, 1964
- 9. for example Grömer K.: The Art of Prehistoric Textile Making: The Development of craft traditions and clothing in Central Europe, Wien, 2016
- 10. Bravermanová M., Leppin B., Otavská V.: Fragment pohřebních šatů a závoj, tzv. kruseler, z rakve českých královen z královské hrobky v katedrále sv. Víta. Das Fragment eines Begräbniskleides und ein Schleir, ein sog. Kruseler, aus dem Sarg böhmischer Königinnen aus der Königsgruft im St. Veitsdom (Fragment of a Funeral Dress and a Kruseler Veil from the Casket of Czech Queens in the Royal Tomb, St. Vitus Cathedral), Archaeologia historica 36, 2011, pp. 593-625
- Bravermanová M., Kloudová R.: Geometricky zdobená tkanina z královské hrobky v katedrále sv. Víta. Geometrisch verziertes Gewebe aus dem Königsgrab im Veitsdom (Fabric with Geometrical Patterns from the Royal Tomb in St Vitus Cathedral), Archaeologia historica 34, 2009, pp. 463-481
- Bravermanová M., Kloudová R., Sliwka A.: Pohřební výbava pražského biskupa Mikuláše. Die Grabausstattung des Prager Bischofs Nikolaus (Funeral Equipment of the Prague Bishop Mikuláš), Archaeologia historica 32, 2007, pp. 477-489; about the fabric with stylised diamond mesh see pp. 483-486
- 13. yet unpublished finding
- Wilckens L. von: Die Textilen Kunste. Von der Spätantike bis um 1500 (The textile arts. From late antiquity until 1500), München, 1991
- Kuhn D. Zhao Feng (Eds): Chinese Silks. The Culture and Civilization of China, Yale University, 128-130, 2012, pp. 344-346
- 16. Geijer A.: A History of Textile Art, London, 1979
- Bravermanová M., Otavská V.: Románská tkanina z královské hrobky na Pražském hradě. Ein romanisches Gewebe aus der königlichen Gruft (Roman fabric from the royal tomb), Archaeologia historica 25, 2000, pp. 405-428

Footnotes:

¹ Definition of weaves and terms in textile technological studies are taken from professional terminology codified by CIETA [8]. Illustrations of weave diagrams are processed according to the following key:



² In all cases, the stated colours are current colours, most of which do not correspond to the original colour.