HAL
open science

Making clothes, dressing the deceased: Analysis of 2nd century AD silk clothing from the child mummy of Burgast (Altai Mountains, Mongolia)

Isaline Saunier, Vincent Bernard, Mathilde Cervel, Dominique Joly, Noost Bayarkhuu, Tsagaan Turbat, Antoine Zazzo, Sébastien Lepetz

▶ To cite this version:

Isaline Saunier, Vincent Bernard, Mathilde Cervel, Dominique Joly, Noost Bayarkhuu, et al.. Making clothes, dressing the deceased: Analysis of 2nd century AD silk clothing from the child mummy of Burgast (Altai Mountains, Mongolia). Archaeological Research in Asia, 2022, 29, pp.100343. 10.1016/j.ara.2021.100343 . hal-03516146

HAL Id: hal-03516146

https://hal.science/hal-03516146v1

Submitted on 15 Nov 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Making clothes, dressing the deceased: Analysis of 2nd century AD silk clothing from the child mummy of Burgast (Altai Mountains, Mongolia)

Isaline Saunier[a], Vincent Bernard[b], Mathilde Cervel[c], Dominique Joly[d], Noost Bayarkhuu[e], Tsagaan Turbat[e], Antoine Zazzo[f], Sébastien Lepetz[f*]

a *École Pratique des Hautes Études, GSRL (UMR 8582), Paris Sciences et Lettres, Les Patios Saint-Jacques, 4-14 rue Ferrus, 75014 Paris, France*

b *Centre de Recherche en Archéologie, Archéosciences, Histoire (CReAAH UMR 6566), Université de Rennes, Campus de Beaulieu, bat. 24/25, 35042 Rennes cedex, France*

c *Archéologie et Philologie d'Orient et d'Occident (AOROC, UMR 8546), CNRS/PSL université, ENS-EPHE, 75014 Paris, France*

d *Former Director of Archaeological Department of the City of Chartres, France*

e *Institute of Archaeology, Mongolian Academy of Sciences, Ulaan Baatar, Mongolia*

f *Archéozoologie, Archéobotanique : sociétés, pratiques et environnements (AASPE), Muséum national d'histoire naturelle, CNRS, CP 56, 55 rue Buffon 75005 Paris, France*

* Corresponding author.

E-mail addresses: i_saunier@hotmail.fr (I. Saunier), vincent.bernard@univ-rennes1.fr (V. Bernard), mathilde.cervel@gmail.com (M. Cervel), dominiquejoly@neuf.fr (D. Joly), turbatts@mas.ac.mn (Ts. Turbat), n_bayaraa2001@yahoo.com (N. Bayarkhuu), lepetz@mnhn.fr (S. Lepetz), zazzo@mnhn.fr (A. Zazzo).

ABSTRACT

The analysis of archaeological textiles is a primary source of knowledge about past societies, and the information it provides is remarkably diverse. However, special preservation conditions are needed to obtain an accurate picture of the use of textiles, particularly in the making of clothing. In Tomb 14 at the site of Burgast (Altai Mountains, Mongolia), excavated in 2016 by the French archaeological mission in Mongolia and the Institute of Archaeology of the Mongolian Academy of Sciences, the particular local conditions favoured the preservation of organic materials, including the complete clothing worn by the mummy of a child belonging to the Bulan-Kobin culture. This paper examines several questions on the origin of the raw material used and the role of these garments in funerary practices. The fibre analysis indicates that the silk and taffeta fabrics used to dress the mummy likely from China. We

consider a plurality of sources (historical, archaeological, technical study analysis), as silk could have travelled. Our study of the tailoring shows that some of the textiles were probably re-used and provides new insights into clothing design and know-how. We argue that the deceased was dressed with care, and we propose that specific, non-quotidian garments were used for the funeral ceremony. Together, these findings contribute to describing little-known aspects of the Bulan-Kobin culture.

Keywords:
Archaeological textiles
Bulan-Kobin culture
Xiongnu-Xianbei-Sarmatian age
Burial
Clothing design
Sewing pattern

1. Introduction

The analysis of archaeological textiles is a first-rate source for knowledge about past societies, and the information it provides is remarkably diverse. Analysis makes it possible to address questions related to the origin of raw materials (from farming or from agriculture, imported or local); the organisation of production or trade networks; processing and manufacturing techniques; the origin of these techniques and their transfer in time and space; and the *chaîne opératoire* used. When the corpus is rich enough and consists of complete pieces of clothing, it is even possible to approach questions related to the history of clothing and its use and role in society (clothing practices and cultures), including its symbolic aspects, such as colours and motifs. Clothing also provides information about the social status, profession and, sometimes, religion or gender of the owner (Polos'mak & Barkova, 2005; Even, 2012; Oka, 2015; Elihina, 2017). However, the discovery of well-preserved clothing and textiles in archaeological contexts remains rare and is governed by different factors that rarely come together in the same site. Most of the time, only small fragments are found, and their study is often limited to a few technical considerations or fibre determinations (André, 2002; Miller et al., 2006; Giscard et al., 2013). Conservation in particular conditions (wet, very dry, or very cold) sometimes provides the possibility of obtaining a fairly accurate picture of these garments. The case we present here is one of these exceptionally well-preserved discoveries. At the site of Burgast, located in the Altai Mountains (Mongolia),

complete, well-preserved silk[i] clothing was found in tombs dating from the beginning of the 1st millennium AD and belonging to the Bulan-Kobin culture. This culture is present in the Altai-Sayan region during the Xiongnu-Xianbei-Rouran period and is already known from several cemeteries excavated in Russia (Seregin and Matterin, 2014, 2016; Tur et al., 2018), and in 2017 and 2018 in Shiveet Khairkhan area of the Mongolian Altai as well (Batbold et al. 2017; Batbold et al. 2018).

The aim of this article is threefold: (1) to study precisely the technical characteristics of these garments (biological origin of the fibres[ii]*, method of weaving*, sewing patterns* used); (2) to discuss the origin of the raw material used and therefore the links that this part of the world must have had with other regions; and, finally, (3) to determine the role of these clothes: Were they everyday clothes? Or were they only considered proper for funeral ceremonies? In addressing these aims, this study contributes to describing little-known aspects of Bulan-Kobin culture in Mongolia.

2. Material and methods

2.1. Archaeological and chronological context

The site of Burgast (Fig. A) is located north of the Aimag of Bayan-Ölgii (District of Nogoonnuur, Mongolia). It was excavated in 2015 and 2016 by members of the French archaeological mission in Mongolia and the Institute of Archaeology of the Mongolian Academy of Sciences[iii] and consists of a 500 m^2 triangular terrace with a height difference of 800 m. The cemetery where the archaeological remains were found is located at 1900 m above sea level, at the western end of the terrace. A complex of 24 individual tombs was extensively excavated (Fig. B). The shape and organisation of the burials, as well as the rare finds of silver–bronze headdress ornaments, identify Burgast as part of the Bulan-Kobin culture (Seregin and Matterin, 2014, 2016).

Twelve out of the 24 excavated burials contained textile remains. Of these, those of Tomb 14 are the best preserved (Fig. C). The deceased, a 3- to 6-year-old child, was oriented east–west, with the head to the west and was placed into a monoxyl (dugout) wooden coffin closed by means of a pegged board, and the coffin was encased inside a stone-slab cyst. The hermetical nature of the tomb resulted in natural mummification[iv] and is at the origin of the excellent preservation of all the organic remains, of which the clothes are the most spectacular. Direct radiocarbon dating of the bone of the child indicates that the child died between 32 and 210 cal AD (2 sigma[v]).

2.2. Preservation conditions

Because they are organic products, textiles are fragile and can be damaged by a variety of factors, such as light, humidity, climate, and insects. Textile remains can be preserved by (i) permineralisation through contact with a metal object (Moulhérat, 2008b); (ii) a wet or dry environment; (iii) carbonisation; and (iv) calcification. At Burgast, the textiles from Tomb 14, were well preserved due to the dry climate, the watertightness of the coffin, which prevented water infiltration, and the absence of burrowing animals in the burial. Textiles from this burial are flexible, colourful, and easy to handle despite the deterioration they underwent in the burial context.

Some of these textiles were isolated during the excavation, while others were removed as a unit, together with human remains, and then separated out during the laboratory study in Ulaanbaatar. Those located on the back of the child in Tomb 14, as well as on the back of the legs and skull have, however, suffered significant damage due to decomposition fluids, which caused humidification of the materials and, ultimately, their destruction. The front parts of the clothing are the best preserved but, some folds of clothing on the chest and legs have also suffered significant damage. Although mould can be seen on the different parts of the clothing, it seems that it only developed after the individual was discovered. However, most textiles are sufficiently well preserved for study purposes, and we can easily identify the garment types of the child's clothing.

2.3. Clothing identification and description

The child was dressed in a hat, a mid-length tunic, trousers, and socks. The face was covered, and the entire body was wrapped in a wool blanket[vi]. The hat covered the top of the forehead and the ears and seems to have a pointy top (Fig. D.1). The hat consists of a narrow green band running around the face, sewn on a yellow piece of textile. It is, at least in part, lined with fine wool felt on the inside (Fig. D.2). A bead found under the chin must belong to the hat (Fig. E). The tunic and trousers were loosened and then removed together at the time of the mummy's undressing in the lab and could not be separated afterwards, as the taphonomic conditions had caused them to become stuck together (Fig. F). The left side of the tunic crosses over the right side and thus partly covers the right side of the torso. We observed no buttons or fasteners. A small, 1.3 cm wide textile band encircled the waist of the individual. The tunic is multicoloured (green, yellow, and brown), but it is difficult to determine whether these colour variations are the result of the degradation of one and the same dye or whether they are the result of different dyes[vii]. It ends at the top of the femurs and

partly covers the trousers, which are mostly brown fabric, with blue–green fabric on the ankles. Underneath, in contact with the skin, remnants of textiles are visible on the right thigh and knee, and their study indicates that they are probably fragmentary elements of the trousers. The yellow–brown socks reach up on the ankles (Fig. G, Fig. H). A 1.5–1.7 cm wide textile band is held in place by loops on the upper edge of the back of each sock. These two bands, tied around the ankles, ensure that the socks are held at the same height.

2.4. Study protocol

Following excavation, the textiles were packaged and stored in a freezer at the Ulaanbaatar Institute of Archaeology. Observations were made on the non-restored textiles. For this reason, some seams and measurements were not recorded and were not drawn on the various diagrams. Microscopic studies were carried out on the better-preserved areas (flat and without snags) in order to obtain the most accurate description possible. Some fragments were so damaged that a complete examination was not feasible.

The first steps of the textile analysis were carried out while the clothes were on the mummy as found. These were to describe the technological aspects of the clothing and the textiles visible; draw each element that makes up the deceased's clothing; and describe the sewing techniques used. The next steps were carried out while the individual was being undressed to expose the different layers of clothing. Between each phase of the undressing, the clothes were dusted with a fine brush and the sediment deposits were removed with pliers. Once the clothing had been removed, all the different pieces of cloth making up the items of clothing were sampled to establish a typology of the garments and the textiles that comprise them. The technical analysis consisted of observation at different scales. The appearance of the textiles was first described with the naked eye. The textiles were then placed under a microscope with an integrated digital camera to photograph the material. The photos were used to determine the weave*. When the state of preservation of the fragments permitted, the fibres were described, the filature* and the different twists were ascertained, and the thread count* was identified. The vast majority of the drawings of the textiles of the garments and the fragments are presented on an orthonormal axis (Ox, Oy), that is, without distinction between warp* and weft*, because no selvedge* could be observed to distinguish between them. In some cases, though, selvedge was observed, making it possible to differentiate the threads of the warp from the threads of the weft. The second stage of the technical analysis consisted of taking a thread from each textile to identify the animal or vegetable nature of the fibre (Moulhérat, 2008a)[viii]. The threads were chosen so as not to destroy the general structure

of the weave. The position of the different garments on the body of the deceased was documented, as were the samples taken and observations under the microscope. After the study, each textile element was wrapped in plastic film or placed in a minigrip ® bag and boxes for storage in a freezer.

3. Results

3.1. From cocoon to taffeta: Weaving silk threads

The identification of the taxonomic identity of the source of the silk fibres was achieved by morphological observations. From a technical point of view, the cocoon consists of a double filament of bave* (brins*) welded together by sandstone (or sericin, a natural glue). In longitudinal view, the fibres look like regular and smooth tubes that do not show any twist. The cross-sectional shape of these filaments is characteristic of the worm species used. Microscopic observation revealed a triangular cross-section with rounded corners and no twist, showing that the material used is the silk of the domesticated worm *Bombyx mori* (Fig. I) (Guicherd, 1946; Nunome, 1992). To make a silk thread, several cocoons are unwound, and the fibres are assembled. During microscopical observation of sections of threads, as an aid to identifying the type of silk, the number of fibres used can also be counted. The child's clothes were made from 15 to 25 cocoons. The silk threads can be used as they are (the woven fabrics are then called grège silk*), but they can also be boiled, either before or after weaving. This is called degummed silk*. Boiling removes some of the grège. The silk then becomes softer and more supple, which favours the dyeing and its colour fastness over time but has the unintended effect of separating the two fibres, making weaving more complicated. For this reason, it is more useful to boil the fabric than the isolated thread. The observation of the bave of the Burgast textiles under the microscope revealed that the two fibres are not separated and that the sericin has therefore not been removed or only partially removed.

All the textiles analysed have a tabby* weave (Fig. J; Emery, 2009), The tabby has a ratio of two threads for two picks: even and odd threads alternate at each pick, above and below the weft. The term tabby is generally used to refer to textiles made of discontinuous fibres, such as cotton or wool. For continuous fibre fabrics, such as silk, the term taffeta is used. Several selvedges have been identified, in some cases revealing which is the warp and which the weft. The quality of the taffeta depends on the number of threads used per centimetre of fabric. The thread count makes it possible to make comparisons between the number of Ox and Oy threads and thus to try to identify recurrences and to determine whether

the weave is rather fine, medium or coarse. Six different qualities have been recognised from the child's clothing:

- 20 by 40 threads/cm
- 24 by 24 threads/cm
- 30–35 by 50 threads/cm
- 40 by 70 threads/cm
- 45 by 80–90 threads/cm
- 50 by 60 threads/cm

Silks, whether mineralised or not, can relax over time, and hence the density of threads per centimetre can vary (Moulhérat, 2013). The quality also depends on the diameter and regularity of the thread, as it can vary according to the cocoons (as the size, the worm or the quality of the worm's food) and the manufacturing process. Some objects, such as the tunic (Fig. K), are made of a thread originating from a large number of cocoons (about 19–20 for one thread) and of homogeneous diameters (10–12 μm), confirming the use of a fine and good-quality silk. In contrast, the bave count indicates that the textiles of the trousers (Fig. L) are made of threads from fewer cocoons. The sericin has been partially removed from the silk fibres of the tunic, but not from the elements of the trousers. The trousers, the tunic and the upper edge of the tunic are made of the same type of taffeta, with a ratio of 20 by 40 threads/cm. The hat (Fig. M), the knotted bands holding up the socks (Fig. N), and the lower border of the tunic are made from taffeta with a ratio of 30–35 by 50 threads/cm. The main body and the ends of the socks are all made of the same silk fabric. The textiles used for the socks have the best weaving quality from among the six types, and threads with a large number of threads per centimetre and a large number of cocoons used for one thread (about 19–20).

3.2. From taffeta to tailoring: Sewing patterns

The hat (Fig. O.3) consists of two pieces of taffeta with slightly circular edges, sewn together to create a rounded shape that fits the top of the head. The seam starts at the top of the forehead and seems to continue to the back of the neck. A 1.5 cm wide piece of textile forms the edge of the hat. The seam values between the main body of the hat and the border have disappeared, but holes left by the stitches are still visible. This border, which is preserved over a total length of 62.4 cm, is sewn in such a way that it surrounds the wearer's face. At the level of the cheeks, it forms two rounded corners on each side of the face. It then

continues under the ears and probably ends behind the head. Two short strips of taffeta were sewn at the rounded corners inside the hat to enable it to be tied it under the chin. One is still in place and is tied to the other one with a knot. The hat is lined with a fine felt now in very poor condition. There are only a few traces left in a 0.5 cm wide hem on the back of the hat.

The tunic (Fig. P) is adjusted to the child's size and would have been worn like a jacket. The main body is composed of a right side, a left side and a back. It closes at the front, with the right side of the garment slipping under the left side. The back and the right side could not be observed. The decomposition fluids destroyed the back of the tunic, and the rigidity of the textile made it impossible to separate the two sides. The left side is visible. The front of the tunic consists of at least seven pieces. The tunic is lined with a textile piece on its lower edge and on the edges of the opening. It can be seen on the lower front of the tunic over a width of about 8 cm. It rises to the edge of the left side; passes behind the neck of the individual, where it is more than 3 cm thick; and then continues on the right side of the tunic, which is hidden behind the left side. The lower edge is completed by a small, 10.4 cm long by 2.5 cm high triangular piece located on the left side of the tunic. The garment is adjusted and stays closed most likely thanks to a small textile band of about 1.3 cm wide located at the level of the child's waist. Among the front pieces, two taffetas have a selvedge, allowing the warp and weft to be determined. It should be noted that the straight grain* of these two taffetas was not used in the making of the clothing; in one case, the straight grain is in the length of the tunic (Fig. Q) and in the other case in its width. Moreover, the selvedges of the taffeta were either used in the stitching values, preventing the clothing from unravelling, or used as a garment border, as on the bottom of the tunic (Fig. R). The sleeves are attached to the main body of the tunic just above the elbows, rather than at shoulder level. We propose two hypotheses for how this was achieved: either the garment has been cut flat, or it has been cut from a fabric folded in half height-wise, then folded in half again width-wise. The left sleeve is retained along its entire length and covers the top of the individual's hand: it measures 44.8 cm long from the base of the neck to the wrist. The right sleeve is very damaged and is preserved over 25.1 cm of its length. The sleeves form a tube whose seams are located at the back of the individual's arms. It is likely that the clothing was assembled by a seam on the child's flanks, but the present condition of the tunic does not allow us to assess this. On each sleeve there is a seam at the elbows and at the upper arms. Measured from the neck, the seam is positioned at 13.8 cm on the right sleeve and at 15.4 cm on the left sleeve. A twisted thread* is observed at the collar of the tunic; this is probably a sewing thread.

The waist of the trousers (Fig. O.1) probably sat at the pelvis, but since the trousers are almost entirely covered by the tunic at this point and the two elements are bonded together, we cannot verify this. The trousers cover the legs down to the ankles and are made up of two legs of equal size but made up in two different ways. The left leg is made of a single piece of fabric forming a tube (minimum 20 cm wide), which closes with a seam at the back with a seam allowance * of 0.4 cm (with stitches at regular intervals, of 0.4 cm). A selvedge can be seen on the bottom of the piece, and this indicates that the straight grain has been laid along the width of the garment. The right leg is made up of at least four pieces of fabric: a single piece of fabric appears to be used as a tube to cover the thigh, and three further pieces, probably rectangular, are sewn together to form a tube and complete the lower leg from the knee. All the stitching values observed are 0.4 cm. A selvedge is also observed, indicating a use of straight grain along the length of the garment. At the lower extremities of the trouser legs, two bands of 5–5.5 cm high are sewn. These are either decorative elements or pieces intended to change the length. The seams connecting these pieces are observed on the front of the trousers, and the seam values are also 0.4 cm. A selvedge is observed on the left-hand element, allowing us to establish the use of the straight grain width-wise. As with the tunic, the selvedges were used to mark the edge of the garment or as a seam value. The trousers are probably made from off-cuts of textiles of different sizes, but special attention was obviously paid to the finishing touches.

The socks (Fig. O.2) appear to be made from off-cuts or re-used textiles, but since the inside of the socks is not visible, we were unable to establish whether the ends are a collection of several elements sewn together or whether they are a few stitches made in the same fabric in order to create the lower part. The main bodies are rectangular pieces whose seams were sewn on the back. Two pieces of fabric are located over these seams to hold the fastening bands. The main body of the socks differs in size between the left and the right, the right one is a little bit longer. To enable each sock to be tied at the same height around the ankle, the lower end of the left sock has been adjusted. The upper edges of the socks have no hem or selvedge, but when worn these were hidden by the trousers slipped over them. The sewing threads have now disappeared and were probably not made of silk: if the threads had been made of silk, they would have been able to withstand damage like silk fabrics.

4. Discussion

Silkworm breeding and silk weaving require a great deal of technical knowledge and specialised equipment. There are currently no archaeological or historical data indicating that

Altaic populations possessed such knowledge and equipment at that time[ix]. It is therefore legitimate to assume that the raw material (silk) and the finished textiles (taffetas) found in the Burgast tomb originate from China. The question then arises as to how this silk was transported to the Altai, who the people were who acted as intermediaries, and what the conditions were under which the raw material was acquired.

During the Han period (206 BC–AD 220), silk manufacturing flourished and was the subject of an intense trade. Han period Chinese silk products have been discovered as far away as northern Siberia and Syria (Nai, 1963). Archaeological discoveries of Han silk not only in China, but also far from the Chinese territory, bear witness the different types of silk and the great variety of both simple and complex weaving techniques used, thanks to the development of new types of looms (Kuhn, 1995; Żuchowska, 2013). Silk-related activities (silkworm breeding, thread making, weaving, and clothing production) were mostly the domain of women (Hinsch, 2003; Żuchowska, 2013), but several official and imperial workshops, employing men, were also established at that time for special trade. The silk industrial centre was located in northern China during the Western Han period (206 BC–AD 9), but moved to southern China during the 2nd century AD (Żuchowska, 2013)[x]. The oldest images of looms capable of making plain tabby date back to the Han period (James, 1986). Tabby was the "most popular type of cloth" (Żuchowska, 2013: 135), although Han weavers were already capable of producing more complex textiles.

Officially exported from China from the time of Emperor Wu Di (r. 141–87 BC) onwards, silk textiles were the subject of transactions with the Yuezhi of Bactria at that time (Good, 1995). The Yuezhi are known to have been horse traders who traded horses for Chinese silk to sell to other rulers of the steppe (Liu, 2001), making them the main intermediaries between the Han and other populations (Obrusánszky, 2018). When the *chanyu* Modun (r. 209–174 BC) fought the king of the Yuezhi, the Xiongnu population – who established the first steppe empire (3rd century BC–2nd century AD) – took over their territories and the control of the trade along the Silk Road[xi]. Since the 2nd century BC, the Silk Road had been a vehicle of power and wealth, and the control of this network was desired by China and by nomadic populations.

As mentioned by Obrusánszky, recent research on the contacts between the Han dynasty and the Xiongnu shows there was more nuance to their relationships and that "[…] commercial and economic interests had determined frontier relations between the two nations" (Obrusánszky, 2018: 59). Like the Yuezhi before them, the Xiongnu played a mediating role between the populations of the West and the Chinese (Obrusánszky, 2018). For

centuries, relations between the Han and the Xiongnu consisted of regular attacks and allegiances. But the Xiongnu population had also goods to exchange. Researchers working in western Siberia found several Xiongnu- and Han-manufactured artefacts that, for Honeychurch (2014), "[…] had political value among the Xiongnu elite, and their appearance in distant regions was not the result of common trade but probably supported a process of political alliance-building in the west." (Honeychurch, 2014: 308). The Xiongnu were not a homogeneous population, and they also ruled other populations, such as the Saka, Qiang, Turfan and Tokhars (Holotova-Szinek, 2005; Obrusánszky, 2018), who probably benefited from the circulation of Chinese goods, such as silks.

Complex silks or silks with decoration, such as embroidery[xii], which are more expensive and valuable, were also used as diplomatic gifts produced on imperial orders and offered to other rulers, such as the Xiongnu rulers (Miller, 2009; Elikhina, 2010; Żuchowska, 2013) or for payment of taxes and bribes[xiii] (Obrusánsky, 2018). Therefore, textiles found in the northwestern regions of Mongolia may have also derive from unofficial trade with China or been acquired as loot[xiv]. Textile objects, in the form of rolls (Obrusánsky, 2018) or in the form of clothing, can thus enter into a circuit of alliance (such as marriage[xv]) and exchange in a political and economic framework[xvi]. In the case of the Xiongnu population, their leaders used to wear imported Chinese silk during their lifetime (Di Cosmo, 2013). Therefore, many of them were buried with these clothes, accompanied by other Chinese objects, such as lacquered boxes and mirrors[xvii]. Di Cosmo (2013) sees in these imported Chinese symbols the taste and attributes of a local elite, also confirming their rank and status. Honeychurch (2014) goes further by saying that the Xiongnu, by circulating silk in distant regions, instituted a "model of political prestiges" and "new systems of value", since silk was not only a precious and good-quality object, but also "associated with the highest levels of political leadership" (Honeychurch, 2014: 308). As for Han dynasty officials, they considered silk, in its production but also certainly in the way it was worn, as a strong form of sinicisation. When some of the inhabitants of the border regions ceased to wear silk, they saw it as an abandonment of Chinese identity[xviii]. These same officials hoped that the Xiongnu people would come to "civilize" themselves by starting to weave like the Chinese did, as a "moral and civilized conduct" (Hinsch, 2003: 184)[xix].

Pieces of silk are regularly found in tombs[xx] from the Xiongnu period, in particular at Noïn-Ula (north of Ulaanbaatar, Töv province), excavated by P. Kozlov of the Russian Geographical Society in 1924 (Rudenko, 1962; Lubo-Lesnitchenko, 1963, 1965; Kulikov et al., 2012; Usova, 2013, Elihina, 2017); at Ilmovaja Pad (Riboud, 1968a, 1968b), in the

Tsaraam Valley (Miniaev, 2006; Moulhérat 2008c); at Gol Mod (André, 2002; Miller et al., 2006); and at Egiin Gol (Giscard et al., 2013). At Gol Mod, archaeologists have discovered fragments of flexible textile including silks; some of these were not clothing but covered the wooden structure or wrapped bronze mirrors. At Egiin Gol, several mineralised taffetas have been identified as raw materials for the manufacture of clothing. However, because of their poor state of preservation, we were unable to reconstitute shapes or to elaborate about sewing skills. The results of the analysis of the silks from the Tsaraam Valley (Moulhérat, 2008c) show some similarities with those from Burgast: tabby, with a thread count of 40 by 70 threads/cm and made with domestic silk grège. The tombs at Noïn-Ula are the one of the rare Mongolian archaeological sites to have yielded non-mineralised textiles with shapes (André, 2002; Giscard et al., 2013; Turbat, 2013). In the 1920s, a lot of Xiongnu textiles were discovered there, including two complete lined deel[xxi], hats, socks and trousers, considered to have been gifts from the Han dynasty. Their excellent preservation make them references for the description of Xiongnu clothing (Erdenebat, 2011; Turbat, 2013: 57–58). The Burgast clothing shows both differences and similarities. The Burgast tunic looks shorter than the Xiongnu deel, which has sewn sleeves; the trousers are fit snugly around the child's legs, unlike the puffy ones found at Noïn-Ula; and the socks have a totally different shape. As for the hat, a Xiongnu garment with a pointy top found in an elite tomb at Noïn-Ula presents similarities in sewing know-how: two pieces are sewn together, and the resulting general shape makes it possible to cover the ears and to attach the hat under the chin, with silk ribbons sewn onto the body of the hat. The Xiongnu hat uses felt and woollen textiles for the lower brim and beige silk for the outer and inner layers (Turbat, 2013: 49).

The textiles found at the Bulan-Kobin culture site of Yaloma-II (Altai Republic) allow a more direct comparison. This site contained a burial of a woman wearing gold earrings, a leather belt and textile fragments, especially around her head, with ties tied under her chin. The reconstruction proposed by Tishkin (2005) suggests to that author that it is a hat. This hat looks like the hat found at Burgast, but without the pointy top. This finding suggests similarities in clothing practices for this period at the regional scale, and especially from a technical point of view for the elaboration of the hat.

At Burgast, the presence of silk attests to direct or indirect contacts with China, involving modes that have yet to be determined (whether trade, looting, taxes, presents, bribes or marriage), and in which the Xiongnu most likely played the role of intermediary. But unlike the elite Xiongnu tombs, the Tomb 14 at Burgast contained no mirrors, lacquered boxes, chariots, jewellery, complex silks and embroideries or other objects of Chinese origin

that would mark them as elite[xxii]. More generally, the Burgast tombs are poor in objects and ornamentation. It is impossible to define the status of the population buried at Burgast based on the artefacts found in the burials, and the apparent indigence of the burials is not a clue. It is noteworthy that at Burgast, the grège has not or only partially been removed from the taffeta and the textiles are not decorated. Even if the number of threads per centimetre and the quantity of cocoons used for a silk thread for some of the taffetas indicate good-quality silk, it is not an extremely fine taffeta, unlike the degummed silks or complex silks that were extremely profitable for the Chinese economy during the Han period (Good, 1995) and have been found in large quantities in Xiongnu tombs (Elihina, 2017).

Because Han dynasty spinners and weavers made silk threads and taffetas of different qualities, these qualities are inferred to have had different uses, prices and values (Żuchowska, 2013). The diversity of qualities of taffetas also perhaps correlates with diversity in the means of or opportunities for supply. When making garments, dressmakers were dependent on the fabric available; they selected which pieces to use according to the size of the items to be made. However, the child's clothing from Burgast shows a desire to achieve general symmetry in the constitution of the garments (arms of the tunic, legs of the trousers, height of the socks). The best quality silk was used to make the smallest pieces, in this case the socks. This raises the question of how many pieces of textile of good quality and adequate dimensions were available for making the entire outfit. The clothes from the child's tomb at Burgast are a rare example of taffeta from the Han period used for making garments. We do not know the people of Burgast acquired these simple items of weaving or whether these fabrics arrived in bolts or in the form of finished garments. The size and shape of the pieces of taffeta suggest that they were off-cuts from textiles or re-used from the recovery of recycled clothing.

These garments undoubtedly testify to some elaborate know-how (in the cutting and sizing of the pieces, assembly of the taffeta, seam allowance, and regular stitching). But this raises a number of questions to which we do not know the answers. Did this know-how exist locally? Did the occupants of Burgast make these garments? What was the history of the techniques? How were the gestures planned, executed and transmitted? What tools were used (needles, knives, measuring tools, etc.)? What dyes were used? Who made the dyes?

Beyond these technical aspects, there are aspects that touch on the history of attitudes and practices around funerals. The people who buried the child paid particular attention to the raw material and design of the clothing and were meticulous in how they fastened the various items of clothing in place. Not only is the clothing made of "noble" materials, it is also

adapted to the size and morphology of the child. The hat is tied under the chin, the front panels of the tunic are perfectly crossed, the legs of the trousers are structurally identical, and the socks are the same length and tied at the same height at the ankles. But were these clothes made for the funeral or did the child wear them while alive? The quality of the silks and their fragility, especially for socks, is hardly compatible with daily wear, especially during everyday activities (walking on stones and rough grass, herding, horse riding, etc.), and there is no evidence of wear and tear caused by regular wearing of the clothes. It is therefore likely that these clothes were made for and worn at special times in the individual's life, as ceremonial or formal wear, or only as clothes to be buried in. These clothes could belong to the archaeological elements specifically related to funerary practices that were observed during the excavation of the cemetery: wooden dishes, food deposits of sheep's tails placed beside the deceased in the grave, and lit hearths. All these elements of rites served as a bridge between the world of the living and that of the dead.

5. Conclusion

At most archaeological sites, poor preservation of organics precludes the study of textile cuts, the reconstruction of sewing patterns and seam allowances and an assessment of the skills involved in cloth and clothing production. The discovery of tomb Structure 14 at the Bulan-Kobin culture site of Burgast, with its well-preserved textile remains, has enabled a multiscale analysis, from the textile fibres to the clothing. Their archaeological context suggests that the silk taffetas used in the clothing must have been produced in Han period China, from domesticated silkworm cocoons. The diversity of qualities and sizes of the pieces of taffeta used suggests multiple sources for the textiles. There is no indication that the silk used by the population buried at Burgast was obtained directly from Han officials or merchants, but the opportunities for this to happen are possible. The taffetas may have reached the Mongolian Altai via different populations of the steppes, and via different means, including as loot, taxes, bribes, presents, marriage trousseaus, or trade items.

The study of the silk and garments of child's tomb shows how unique the Bulan-Kobin culture was, with similarities but also notable differences with tombs from chronologically or regionally close cultures. Silk fabric, which was also discovered in large quantities in tombs erected for the Xiongnu elite in the 1st and 2nd centuries AD, provides clues to new systems of value that members of the Bulan-Kobin culture may also have benefitted from. But as our study shows, the way the Bulan-Kobin people at Burgast used silk fabric, was unique to them. The way in which the garments were designed suggests that they incorporated textile off-cuts

or fabric re-used from an existing item of clothing and highlights the fact that the dressmaker(s) possessed elaborate technical skill and know-how. This skill allows the people buried in Burgast to use textiles of different sizes to make clothing with the limited fabric available to them. This dexterity highlights practical problem solving, competence and experience in the field of sewing and tailoring. These clothes were perhaps made specifically for the funeral. According to the primary materials collected (two steps similar or close in time), it seems that the garments were designed with care, to fit the size and morphology of the deceased. They were also placed on the child with care.

The symbolic value that the people of Burgast placed on textiles and clothing used for burial, and the thought systems around their conception of the afterlife, remain inaccessible to us. But even without this knowledge, these results contribute to the broader history of studies of textile discoveries in Mongolia, China and the Russian Altai. And because of the rarity of preserved textiles in this region, the finds from Tomb 14 at Burgast greatly increase the corpus of funerary clothing from the Bulan-Kobin culture of the Mongolian Altai, thereby increasing the scope for both intra- and inter-cultural comparison.

Acknowledgements

This study was carried out within the framework of the work of the French Archaeological Mission in Mongolia (director Sébastien Lepetz) funded by the MEAE (Ministry for Europe and Foreign Affairs), the CNRS (National Centre for Scientific Research), the MNHN (National Museum of Natural of History) and the Labex BCDiv. We would like thank to the French and Mongolian excavators of the 2015 and 2016 fieldwork season at Burgast, C. Moulhérat (Musée du Quai Branly - Paris) for his help throughout this study, and S. Needs-Howarth for editing the English.

GLOSSARY

The definitions of technical textile terms are taken from the CIETA publication (Guelton, 2005 [1997]), with the exception of *straight grain*, *sewing pattern* and *seam allowance*, which are based on empirical data from the contemporary sewing world.

Bave. The twin filaments (brins) cemented together by gum sericin emitted by the silkworm.

Brin. A single filament of silk; one of the two emitted by the silkworm in making the cocoon thread, the bave.

Degum. To remove the gum sericin from raw silk, for example by boiling it in a soap solution. The process may be partial or complete.

Felt. A fabric formed by matting together of fibres, generally either wool or wool and hair, under heat and pressure.

Fibre. Any substance composed of thread-like tissue, whether animal, vegetable or mineral, especially when capable of being spun or woven.

Filature. Synonym of reeling. Any rotary apparatus on which thread may be wound during manufacture.

Grège. The silk thread produced by reeling together the baves of several cocoons. Grège has no twist. It cannot be used for weaving except in the gummed state, either dyed or undyed. Also called nett silk, raw silk, or reeled silk. The term grège is recommended by CIETA as these other terms also have other meanings.

Plain. Term used to describe a textile with a uniform, unbroken surface, one that is woven with shafts in which the weave unit is constantly repeated without variation.

Plied yarn. A yarn composed of two or more previously spun or twisted yarns that have been united by twisting. The direction of the twist is usually opposite to that of the individual ends.

Reversible. Having either side usable as the face. In French, Italian and Spanish, a special distinction is made when the two faces of a reversible textile are identical.

Selvedge. The longitudinal edge of a textile often distinguished by warp ends differing from those in the body of the textile and sometimes by a change in the binding from the rest of fabric.

Sewing pattern. For the purpose of this article, the sewing pattern is a flattening of a garment, front or back, without the seam allowances, which is used for the design and then the making of the garment. The sewing pattern, including that which has been established from the

garments found at Burgast, is a means of representation that makes it possible to understand the gestures and techniques used at the time.

Seam allowance The sewing value is a margin added to the sewing pattern of a garment to allow sewing at a distance away from the edge of the fabric. The width of the seam allowance may vary depending on the position of the seam within the garment and the intended use of the garments.

Straight grain. The straight grain is the direction given to the fabric when the garment is made: it is placed parallel to the warp threads and selvedges. In contemporary sewing, particular attention is given to straight grain because the warp threads are tighter than the weft threads, and garments can be deformed if this distinction is not respected. Straight grain is used for the length of the garments.

Tabby. Binding system or weave based on a unit of two ends and two picks, in which each end passes over one and under one pick, the points of binding being set over one end on successive picks. If, in the weave unit, two or more ends or weft threads move together as one, the term extended tabby is used.

Thread count. The number of warp ends or picks per unit of measure.

Warp. The longitudinal threads of a textile; those that are arranged on a loom. A single thread of warp is called an end. Alone, the term warp denotes all the warp ends in a textile. Suitably qualified, it denotes all the warp ends engaged in a specific function.

Weave. To make a textile on a loom by interlacing warp and weft in a specific order.

Weft. The transverse threads of a textile; those that are passed through the sheds. Also termed woof or filing, but these terms are not recommended by CIETA. Alone, the term weft denotes all the picks in a textile. Suitably qualified, it denotes all the picks engaged in a specific function.

References

André, G., 2002. Une tombe princière Xiongnu à Gol Mod, Mongolie (campagnes de fouilles 2000–2001) [A Xiongnu Princely Tomb at Gol Mod, Mongolia (2000–2001 Excavation Campaigns)]. Arts Asiatiques 57(1), 194–205. https://doi.org/10.3406/arasi.2002.1489.

Barkova, L., 2013. Tehnologicheskaia harakteristika sherstianyh tkanei iz bol'shih altaiskih kurganov [A Technological Characterisation of Woollen Textiles from the Great Altai Kurgans]. Arheikigicheskii sbornik 39, Materialy i issledovaniia po arheologii Evrasii. Pamiati M.B. Shukina posviashchaetsia, Izd-vo Gos. Èrmitazha. 40–55[59]. (in Rus.)

Barthes, R., 1957. Histoire et sociologie du vêtement (quelques observations méthodologiques) [History and Sociology of Clothing (Some Methodological Observations)]. Annales ESC 12(3), 430–441. https://doi.org/10.3406/ahess.1957.2656.

Batbold, N., Batsukh, D., Bayarkhuu, N., Nandintsetseg, N., Byung Yong-Hwan, Kim Kong-Wu. 2017. Mongol-Solongosyn khamtarsan "Soyolyn oviig sudalj khamgaalakh" tosliin kheeriin shinjilgeenii angiin 2017 ony ajlyn tailan [Report of the Mongolian-Korean Joint Project "Study and Preservation of Cultural Heritage" 2017 Field Work]. Institute of History and Archaeology, Mongolian Academy of Sciences. (in Mong.)

Batbold, N., Batsukh, D., Bayarkhuu, N., Jeong Song-Muk, Kim Kong-Wu. 2018. Mongol-Solongosyn khamtarsan "Soyolyn oviig sudalj khamgaalakh" tosliin kheeriin shinjilgeenii angiin 2018 ony ajlyn tailan [Report of the Mongolian-Korean Joint Project "Study and Preservation of Cultural Heritage" 2018 Field Work]. Institute of History and Archaeology, Mongolian Academy of Sciences. (in Mong.)

Bunker E.C., 1991. The Chinese artifacts among the Pazyryk finds. Notes in the History of Art 10(4), 20–24. https://doi.org/10.1086/sou.10.4.23203291.

Chin, T.T., 2010. Defamiliarizing the foreigner: Sima Qian's ethnography and Han-Xiongnu marriage diplomacy. Harvard J. Asiatic Stud. 70(2), 311–354. https://doi.org/10.1353/jas.2010.0004.

Christian, D., 2000. Silk Roads or Steppe Roads? The Silk Roads in world history. J. World Hist. 11(1), 1–26. https://doi.org/10.1353/jwh.2000.0004.

Delaporte, Y., 1980. Le signe vestimentaire [The Clothing Sign]. L'Homme 20(3), 109–142. https://doi.org/10.3406/hom.1980.368102.

Delaporte, Y., 1984. Perspectives méthodologiques et théoriques dans l'étude du vêtement [Methodological and Theoretical Perspectives in the Study of Clothing], in: Delaporte, Y., (Ed.), Vêtement et sociétés 2, Actes du Colloque national CNRS "Vers une anthropologie du vêtement". L'Ethnographie 92–94, pp. 33–57.

Delaporte, Y., 1990. Le vêtement lapon : formes, fonctions, evolution [The Lapland Garment: Forms, Functions, Evolution]. PhD diss., Atelier national de reproduction des thèses, Lille.

Delaporte, Y., De Fontanes, M., (Eds.) 1983. Vers une anthropologie du vêtement : concepts, méthodes et théories dans l'étude des costumes ethnologiques et historiques [Towards an Anthropology of Clothing: Concepts, Methods and Theories in the Study of Ethnological and Historical Costumes]. Musée de l'Homme, Laboratoire d'éthnologie du Museum national d'histoire naturelle, Paris.

Desroches, J.-P., Brosseder, U., André, G., Yeruul-Erdene, Ch., 2009. Ein spektakuläres Fürstengrab der Xiongnu [A Spectacular Princely Tomb of the Xiongnu]. Archäol. Deutschland 1, 14–18. https://www.jstor.org/stable/26318243. (in Germ.)

Di Cosmo, N., 1994. Ancient Inner Asian nomads: their economic basis and its significance in Chinese history. J. Asian Stud. 53(4), 1092–1126. https://doi.org/10.2307/2059235.

Di Cosmo, N., 2002. Ancient China and Its Enemies: The Rise of Nomadic Power in East Asian History. Cambridge University Press, Cambridge.

Di Cosmo, N., 2009. Han Frontiers: Toward an Integrated View. J. American Oriental Soc. 129(2), 199–214. https://www.jstor.org/stable/40593813.

Di Cosmo, N., 2013. Aristocratic elites in the Xiongnu empire as seen from historical and archeological evidence, in: Jürgen, P. (Ed.), Nomad Aristocrats in a World of Empires. Dr. Ludwig Reichert Verlag, Wiesbaden, pp. 23–54.

Elihina, Yu. (Elikhina, J.), 2017. Ermitaj dah' Noyon Uulyn erdnes. P.K. Kozlovyn shinjilgeenii angi [Treasures of the Noïn-Ula Kurgans: The Finds of P.K. Kozlov's Expedition]. Mongol ulsyn shinjleh uhaany akademi tüüh, arheologiin hüreelen, Orosyn Holboony Uls Ermitaj ulsyn muzei, Ulaanbaatar. (in Mong.).

Emery, I., 2009. The Primary Structures of Fabrics, an Illustrated Classification. Thames & Hudson, London.

Erdenebat, U., Bayar, D., 2011. Hünnügiin gezeg üsnii zasalt ba huvtsas ömsgöl [Xiongnu Braid Hairstyle and Clothing], in: Törbat, Ts., Hünnügiin arheologi tüühiin sudalgaany zarim asuudal [Xiongnu Archeology, Some Problems of Historical Research]. Ulaanbaatar, Studia Archaeologica, Instituti Archaeologici, Academiae Scientiarum Mongolicae, 31(11), pp. 161–182. (in Mong.).

Even, M.-D., 2012. Les Mongols au tournant du XXe siècle : populations, société, pratiques vestimentaires, in: Charleux, I. (ed.), La Mongolie entre deux ères / Mongolia between two eras. Exhibition catalog. Albert Khan, musée et jardins, 28 novembre 2011-16 septembre 2012. Albert-Khan, Musée et Jardins, Boulogne Billancourt, pp. 102–127.

Gay, M.-C., Monrocq, R., 1972. Identification des fibres textiles naturelles par examen microscopique [Identification of Natural Textile Fibres through Microscopic Examination]. Annales du Laboratoire de recherche des musées de France, Paris, pp. 16–22.

Giscard, P.-H., Turbat, Ts., Crubézy, E. (Eds.), 2013. Le premier empire des steppes en Mongolie : histoire du peuple Xiongnu et étude pluridisciplinaire de l'ensemble d'Egyin Gol, mission archéologique de l'Institut des déserts et des steppes [The First Steppe Empire in Mongolia: History of the Xiongnu People and Multidisciplinary Study of the Whole of Egyin Gol, Archaeological Mission of the Institute of Deserts and Steppes]. Editions Faton, Dijon.

Good, I., 1995. On the question of silk in pre-Han Eurasia. Antiq. 69(266), 959–968. https://doi.org/10.1017/S0003598X00082491.

Guelton, M.-H., 2005 [1997]. Vocabulaire français : français, allemande, anglais, espagnol, italien, portugais, suédois [French Vocabulary: French, German, English, Spanish, Italian, Portuguese, Swedish]. Centre international d'étude des textiles anciens, Lyon.

Hanks, B., 2010. Archaeology of the Eurasian Steppes and Mongolia. Annual Rev. Anthropol. 39(1), 469–486. https://doi.org/10.1146/annurev.anthro.012809.105110.

Hinsch, B., 2003. Textiles and female virtue in Early Imperial Chinese historical writing. NAN Nü Men, Women Gender China 5(2), 170–202. https://doi.org/10.1163/156852603322691119.

Holotova-Szinek, J., 2005. Les relations entre l'empire des Han et les Xiongnu : vestiges archéologiques et textes historiques [The Relationship between the Han Empire and the Xiongnu: Archaeological Remains and Historical Texts]. Études chinoises 24, 221–231. https://doi.org/10.3406/etchi.2005.1359.

Honeychurch, W., 2013. The nomad as state builder: historical theory and material evidence from Mongolia. J. World Preh. 26(4), 283–321. https://doi.org/10.1007/s10963-013-9069-2.

Honeychurch, W., 2014. Alternative complexities: the archaeology of pastoral nomadic states. J. Archaeol. Res. 22(4), 277–326. https://doi.org/10.1007/s10814-014-9073-9.

James, J.M., 1986. Silk, China and the drawloom. Archaeol. 39(5), 64–65.

Kan ŭi cheguk – Monggol 칸의 제국 몽골 2018 — Nomadic Empires of the Mongolian Steppes, special exhibition, 16 May–17 July. Musée National de Corée, 국립중앙박물관, Seoul.

Kim, Yong-Mun 김 용 문, 2013. Hyungno(Xiongnu) ui bogsigmunhwa-e gwanhan yeongu" 흉노(匈奴)의 복식문화에 관한 연구 / A Study on the Costume Culture of Xiongnu. J.

Korean Soc. Costume 63(3), 1–16. https://doi.org/10.7233/jksc.2013.63.3.001. (in Kor., with English title and abstract)

Kradin, N.N., Tishkin, A.A., Kharinsky, A.V., 2005. Sotsialnaya struktura rannih kochevnikov Evrasii [Social Structure of Early Nomads in Eurasia]. Izdatel'stvo Irkutskogo gosudarstvennogo tehnicheskogo universiteta, Irkutsk. (in Rus.).

Kuhn, D., 1995. Silk weaving in ancient China: from geometric figures to patterns of pictorial likeness. Chinese Sci. 12, 77–114. https://www.jstor.org/stable/43290486.

Kulikov, V.E., Mednikova, E.Y., Elikhina, Y.I., Miniaev, S.S., 2012. The method of polypolarization: an experiment in studying the ancient fabrics from Noyon Uul, in: Sava, E. (Ed.), Tyragetia, Arheologie Istorie Antică VI [XXI](1). Muzeul National de Arheologie Și Istorie a Moldovei, Chişnau, pp. 329–345.

Liu, X., 2001. Migration and settlement of the Yuezhi-Kushan: interaction and interdependence of nomadic and sedentary societies. J. World Hist. 12(2), 261–292. https://www.jstor.org/stable/20078910.

Lubo-Lesnitchenko, E., 1963. Chinese silk embroidery from Noin-Ula. Artibus Asiae 26(3/4), 181–190.

Lubo-Lesnitchenko, E., 1995. Concerning the chronology and ornamentation of Han Period textiles. Orientations 26/5, 62–69.

Matrenin, S.S., 2005. Ukrasheniia I predmety kostiuma kak istochnik dlia rekonstruktsii sotsuak'noi struktury kochevnikov Gornogo altaia hunnno-sian'biiskogo vreme [Jewellery and Costume Items as a Source for the Reconstruction of the Social Structure of the Hunno-Syanbi Nomads of the Mountain Altai.], in: Tishkin, A.A. (Ed.), Snariazhenie kochevnikov evrazii, sbornik nauchnyh trudov, Izd-vo Alt. un-ta, Barnaul, 189–195. (in Rus.)

Miller, B.K., 2009. Power politics in the Xiongnu Empire. PhD diss. Univ. Penn., Phila.

Miller, B.K., 2014. Xiongnu "kings" and the political order of the Steppe Empire. J. Econom. Social Hist. Orient 57(1), 1–43.

Miller, B.K., Allard, F., Erdenebaatar, D., Lee, C., 2006. A Xiongnu tomb complex: excavations at Gol Mod 2 cemetery. Mongolian J. Anthropol. Archaeol. Ethnol. 2(2), 1–21.

Miniaev, S.S., Sakharivskaia, L.M., 2006. Investigation of a Xiongnu royal tomb complex in the Tsaraam Valley. Silk Road 4(1), 47–58.

Moulhérat, C., 2001. Archéologie des textiles protohistoriques : exemple de la Gaule celtique [Archaeology of Protohistoric Textiles: An Example from Celtic Gaul]. PhD diss., Univ. Paris 1 Panthéon-Sorbonne.

Moulhérat, C., 2008a. L'archéologie des textiles : une nouvelle discipline au service de la connaissance et de la compréhension des sociétés humaines [The archaeology of textiles: A New Discipline in the Service of Knowledge and Understanding of Human Societies]. L'actualité chimique 318, 30–34.

Moulhérat, C., 2008b**.** Archéologie des textiles [Archaeology of textiles]. Les nouvelles de l'archéol. 114, 18–23.

Moulhérat, C., 2008c. La nécropole impériale de Tsaaram : quelques exemples de textiles conservés au musée de l'Hermitage à Saint-Petersbourg [The Imperial Necropolis of Tsaaram: Some Examples of Textiles Conserved at the Hermitage Museum in St Petersburg]. Centre d'étude et de recherche sur le textiles anciens CERTA, Paris. (Unpublished results)

Moulhérat, C., 2013. Les vestiges textiles [The Textile Remains], in: Giscard, P.-H., Turbat, Ts., Crubézy, E. (Eds.), Le premier empire des steppes en Mongolie : histoire du peuple Xiongnu et étude pluridisciplinaire de l'ensemble d'Egyin Gol, mission archéologique de l'Institut des déserts et des steppes [The First Steppe Empire in Mongolia: History of the Xiongnu People and Multidisciplinary Study of the Whole of Egyin Gol, Archaeological Mission of the Institute of Deserts and Steppes]. Editions Faton, Dijon, pp. 297–312.

Nai, H., 1963. Recent archaeological work in China. Archaeol. 16(3), 176–182.

Nunome, J., 1992. The Archaeology of Fiber before Your Eyes: A Compilation of Photographs of Fiber Artifacts. Senshoku to Seikatsusha, Kyoto.

Obrusánszky, B., 2018. Huns and Chinese frontier policies on the Silk Road. J. Frontier Stud. 3, 59–72. https://doi.org/10.24411/2500-0225-2018-10016.

Oka, I., 2015. Mongol clothing in the Yuan Period. Acta Orientalia Academiae Scientiarum Hungaricae 68(4), 385–414. https://doi.org/10.1556/062.2015.68.4.2.

Pankova, S., 2016. Unearthed early silks from the Silk Road in Russia, in: Zhao, Feng (Ed.), The Silk Road: A Road of Silk. Donghua University Press, Hangzhou.

Psarras, S.-K., 2003. Han and Xiongnu: a reexamination of cultural and political relations (I). Monumenta Serica 51, 55–236. http://www.jstor.org/stable/40727370.

Polos'mak, N., Barkova, L., 2005. Kostium i Tekstil, Pazyryktsev Altaia (IV–III vv. go. n. è.) [Costume and Textile, Pazyryk Altai (4th–3rd cent. BC)]. INFOLIO, Novosibirsk. (in Rus.)

Riboud, K., 1968a. Les Soieries Han : I. Aspects nouveaux dans l'étude des soieries de l'Asie Centrale [Han Silks: I. New Aspects in the Study of Central Asian Silks]. Arts Asiatiques 17, 93–116. https://doi.org/10.3406/arasi.1968.988.

Riboud, K., 1968b. A comparative study of two similar Han documents: polychrome figured silks from Lou-Lan and Ilmovaya Pad. Bull. CIETA 28, 5–63.

Rogers, J.D., 2012. Inner Asian states and empires: theories and synthesis. J. Archaeol. Res. 20(3), 205–256. https://doi.org/10.1007/s10814-011-9053-2.

Rudenko, S.I., 1962. Kul'tura hunnov i Noinulinskie kurgany [Xiongnu Culture and Noïn-Ula Kurgans]. Izd-vo Akademii nauk SSSR, Leningrad. (in Rus.)

Seregin N.N., Matrenin S., 2014. Arheologičeskie kompleksy Altaâ II v. do n.è. – XI v. n.è.: istoriâ issledovanij i osnovnye aspekty interpretacii : monografiâ [Archaeological Complexes of the Altai 2nd century BC–11th century AD: History of Research and Main Aspects of Interpretation] (in Rus.). Coll. Barnaul : Izd-vo Alt. un-ta - Altai State, University Publishing House.

Seregin N.N., Matrenin S., 2016. Pogrebal′nyj obrâd kočevnikov Altaâ vo II v. do n.è. – XI v. n.è [The Funeral Ceremony of the Altai Nomads in the 2nd century BC–11th century AD] (in Rus.). Coll. Barnaul : Izd-vo Alt. un-ta - Altai State, University Publishing House.

Tishkin, A.A., 2005. Vozmozhnosti rekonstruktsii zhenskoi odezhdy unnuskogo vremeni po arheologicheskim materialam iz gornogo altaia [Possibilities of Reconstruction of Women's Clothing of the Xiongnu Period According to Archaeological Materials from the Altai Mountains], in: Tishkin, A.A. (Ed.), Snariazhenie kochevnikov evrazii, sbornik nauchnyh trudov. Izd-vo Alt. un-ta, Barnaul, 195–201. (in Rus.)

Tur S.S., Matrenin S.S., Soenov V.I., 2018. Armed violence among the Altai Mountains pastoralists of the Xiongnu-Sarmatian age. Archaeol. Ethnol. Anthropol. Eurasia 46(4)132–139.

Turbat [Törbat], Ts. (Ed.), D. Tseveendorj (Ed. in chief), 2013. Encylopaedia Xiongnu. Institute of Archaeology & Mongolian Academy of Sciences, Ulaanbaatar.

Usova, I.A., 2016. Opyt primeneniia kompleksnogo podhoda pri izuchenii kostiuma kochevogo naseleniia Iuzhnoi Sibiri i sopredel'nyh territorii kontsa IX–III vv. do n.è. (istoriografichskii obzor) [Learning from the Integrated Approach of Costume of the Nomadic Population of Southern Siberia and Neighbouring Countries of the late 9th–3rd century BC. (historiographical review)]. Aktual'naia arheologiia 3. Novye interperetatsii arheologichesjih dannyh. Tezisy mezhdunarodnoi nauchnoi konferentsii molodyh uchenyh, St Petersburg, 25–28 aprelia 2016. Rossiiskaia Akademiia NAUK, Institut Istorii Material'noi Kul'tury, St Petersburg, pp. 367–371. (in Rus.)

Usova, I.A., 2013. Osnovnye ètapy izucheniia kostiuma kochevnikov Iuzhnoi Sibiri i sopredel'nyh territorii hunnuskosian'biisko-zhuzhansjogo vremeni (II v. do n.è. – V v. n.è.)

[The main Aspects of Costume Study of South Siberia and Its Borderlands Nomads in Khunnu-Xianbi-Zhuzhan Time (2nd century BC–5th century AD)]. Izvestija Altajskogo gosudarstvennogo universiteta. Serija Istorija. Politologija. 4/2 (80), pp. 218–222. (in Rus.)

Żuchowska, M., 2013. From China to Palmyra: the value of silk. Światowit: rocznik poświęcony archeologii przeddziejowej i badaniompierwotnej kultury polskiej i słowiańskiej 11(52/A), 133–154.

LIST OF FIGURES

Fig. A Situation map of the Burgast site in Mongolia

Fig. B Plan of the Bulan-Kobin necropolis of Burgast.

Fig. C Burgast Burial ST 14, with the mummy in situ

Fig. D.1. Multi-angle drawings of the hat on the head of the child. Burgast. ST14. 14053 (in color)

Fig. D.2. Details of the inner edge of the hat. Burgast. ST14. 14053 (in color)

Fig. E Bead still belonging to a piece of textile, discovered under the child's chin (in color)

Fig. F Drawings of the tunic and trousers, showing the colours of the different components and creases in the fabric (left) and the topstitched seams (right). Burgast. ST14 (in colour)

Fig. G Drawings of the left sock, showing the colours of the different components and creases in the fabric (left) and the and topstitched seams (right). Burgast. ST14. 14055 (in colour)

Fig. H Drawings of the right sock, showing the colours of the different components and creases in the fabric (left) and the and topstitched seams (right). Burgast. ST14. 14056 (in colour)

Fig. I Drawing of the longitudinal and cross-sectional shape of the silk of the domestic silkworm, *Bombyx mori,* viewed under a microscope (drawing from Guicherd 1946)

Fig. J Schematic drawing of a plain and reversible taffeta (drawing from Emery 2009)

Fig. K Textiles analyzes of the threads from the tunic (in color)

Fig. L Textiles analyzes of the threads from the trousers (in color)

Fig. Textiles analyzes of the threads from the hat (in color)

Fig. N Textiles analyzes of the threads from the socks (in color)

Fig. O.1 Reconstructed sewing pattern of the trousers (in b&w)

Fig. O.2 Reconstructed sewing pattern of the socks (in b&w)

Fig. O.3 Reconstructed sewing pattern of the hat (in colour)

Fig. P Reconstructed sewing pattern of the tunic, showing front and back views (a) and folded-out view (b).

Fig. Q Selvedge along the tunic's length, showing the holes left by stitches (in colour)

Fig. R Selvedge along the tunic's bottom (in colour)

---

[i] Remains of felt (probably goat or sheep's wool according to the analyses) have also been found. These will be the subject of another publication. Organic materials, such as felt, wool, and especially silk, used for clothing or horse saddles, are attested from tombs in Altai as early as the 6th century BC (see Polos'mak & Barkova, 2005). Russian researchers intensified their studies of nomadic costume starting in the 1990s, thanks to the discovery of numerous textiles in tombs in the Altai, the Republic of Tuva, and Kazakhstan (see Usova, 2013, 2016).

[ii] Words followed by an asterisk (*) are defined in the glossary.

[iii] Mission under the supervision of S. Lepetz and Ts. Turbat, financed by the Centre national de la recherche scientifique (France); the French Ministry of Europe and Foreign Affairs; the Muséum national d'Histoire naturelle (Paris, France), and Laboratoire d'excellence Diversités biologiques et culturelles (Labex BCDiv).

[iv] The term *mummy* is used here in the context of natural mummification: the conditions allowed the bodies of the deceased to preserve naturally, without human intervention, without a mummification ritual.

[v] ECHo 1726: 1900 ± 25 BP; 32–210 cal AD (2 sigma, 95.4% confidence).

[vi] Problems around the description and classification of clothing were raised in particular in the studies of R. Barthes (1957) and Y. Delaporte (1980, 1984, 1990). To remedy a lack of reflection around clothing, Y. Delaporte and his team set up a survey protocol in an attempt at arriving at a world technological classification of clothing. This brought to light many discrepancies in terminology. The first difficulty encountered in social anthropology is translating vernacular terms into other languages, and it is therefore complex to transpose French or English terms onto clothing from a distant era and culture. It remains difficult to transcend collective communities and to highlight universal patterns. By comparison, typologies for archaeological ceramics are made and the ceramics analysed by region and then used for inter-regional comparisons, but they are constituted outside the civilisations studied. Similarly, in schematic thinking, proposing a framework independent of a culture and a geographical area in order to establish a descriptive system on a global scale does not work. Thus, we wish to draw attention to the terms of clothing identification that were chosen for this paper: these echo the understanding of the clothing terms we have in our societies today.

[vii] A study of the dyes would make it possible to verify how the fibres were dyed, to see what materials were used to dye them, and to thus, perhaps see whether these dyeing elements are local or imported.

[viii] The fibre analyses were carried out at the Musée du Quai Branly (Paris, France); we thank C. Moulhérat for his help and for providing the material necessary for the study.

[ix] The same observation can also be made for the woollen textiles found in the Great Altai kurgan barrows of the ancient Altaic population (6th–3rd century BC) (Ukok Plateau, Pazyryk, Arzhan I and II), because no material evidence has been found to demonstrate local production. See Barkova, 2013.

[x] "During the Western Han period (206 BC – AD 9) the most important silk industry centres were developing in the area of the North China Plain, especially in the middle flow of the Yellow River During the Eastern Han [東

漢] reign (aD 25–220) southern manufactures developed and Sichuan silk fabrics become renowned all over China (Zhao 2005a: 86–87)" (Żuchowska, 2013: 135).

[xi] For the Silk Road and its history, see in particular Christian, 2000.

[xii] To better understand silk weaving, and especially the complex silk found in Noyon Uul, see Kuhn, 1995.

[xiii] "The amount of them [*huge presents or bribing*], however, had to be steadily increased. In 51 BC 8,000 silk rolls were given for such purposes, that amount has already increased to 30,000 rolls by 1 CE. In addition, copper money was given to loyal kings and princes. From the 1st century to the middle of the 2nd century, the whole state budget was 10 billion copper income of which 3 to 4 billion were sent abroad as a gift (Garnet, 2001, p. 117), which means that 30 to 40 percent of the revenues devoted to corruption" (Obrusánszky, 2018: 65).

[xiv] "In all likelihood the presence of silk in this region (as well as Pazyryk in Siberia) represents unofficial trade or bribery, if not plunder from raiding (for detailed study of relations between Chinese and Steppe nomads, see Barfield 1989)" (Good, 1995: 963).

[xv] A special political relation called *heqin*, who is here a diplomatic marriage sino-xiongnu, was established after the defeat of the Han army against *chanyu* Modun (see Psarras, 2003; Miller, 2009; Chin, 2010). The treaty granted to the *chanyu* the hand of a Chinese princess, but also gifts, such as alcohol, cereals, silks, and clothing. Obrusánszky also mentions an official belonging to the Han dynasty whose mother was a Xiongnu princess (Obrusánszky, 2018), but maybe that kind of marriage was not part of the *heqin*.

[xvi] "During the Han dynasty, commercial and official transactions often employed cloth as a kind of money. Cloth was a far more reliable medium of exchange than the official currency; the value of coins fluctuated wildly in early imperial times. Textiles, in contrast, were in constant demand and could be readily exchanged for other goods. The market for both bolts of cloth and finished clothing was highly developed in Han times, making cloth production one of the most advanced industries of that era. In sum, the importance of cloth to the early Chinese economy cannot be underestimated" (Obrusánszky, 2018: 65). "However, delivering a huge amount of silk, and other Chinese luxury products only reached its goal in the short term, because the market has been full of silk products, so the price of silk gradually decreased, nobody was interested in it for high price" (Hinsch, 2003: 171).

[xvii] The combination of different Chinese artefacts, such as silk, mirrors, and lacquered boxes, has already been observed in the tombs of the Pazyryk culture in the Altai. See Bunker, 1991.

[xviii] "Han dynasty officials considered hemp and silk cloth so integral to Chinese identity that they served as an unambiguous point of cultural division between China and the northern nomads. If border people wove cloth, this was taken as an important sign of sinicisation. When they abandoned Chinese hemp and silk for wool, Han officials looked on this trend with alarm as a sign of creeping barbarisation. For example, in his discussion of China's northwestern border regions, Han Anguo 韓安國 (second century BCE) noted with anxiety that local people living near the Xiongnu had abandoned Chinese-style weaving and had increasingly adopted nomadic customs. To him, the meaning of this development was clear. When people gave up making cloth from hemp and silk, they were turning their backs on Chinese culture" (Hinsch, 2003: 183).

[xix] "Emperor Han Wendi 漢文帝 (r. 180-157 BCE) expressed a similar sentiment in a revealing letter to the Xiongnu chieftain. In this epistle Emperor Wen explained that he had caused the myriad people "inside the Great Wall" to pursue plowing and weaving. Given Emperor Wen's paternalistic tone, presumably he was trying to set a good example for the Xiongnu ruler. Maybe he even hoped that the Xiongnu might settle down to become farmers and weavers in imitation of the Chinese, assuming that a change of lifestyle would have a civilizing and pacifying influence that would render them innocuous. However, he expressed his expectations not in such pragmatic terms, but in highly moralistic rhetoric. He seems to have regarded weaving as a superior lifestyle because he considered it civilized, hence a sign of moral behavior. He did not portray weaving hemp and silk to be specifically Chinese but as moral and civilized conduct in general" (Hinsch, 2003: 184).

[xx] See Pankova, 2016.

[xxi] The term *deel*, which today refers to the "traditional" Mongolian clothing and which can be described in Occidental languages as a "dress-coat", is systematically used by Mongolians to describe archaeological garments referred to in English as coats, tunics and caftans, especially those found in Mongolia.

[xxii] Chinese sources relating the events of the first half of the 1st c. AD evoke "a decline and a dismemberment of the empire of the steppes", while archaeological excavations bring to light remains that "give on the contrary the image of a power in full economic and political expansion participating in commercial exchanges throughout Asia". See Holotova-Szinek, 2005.

Figures

Fig. A. Situation map of the Burgast site in Mongolia.

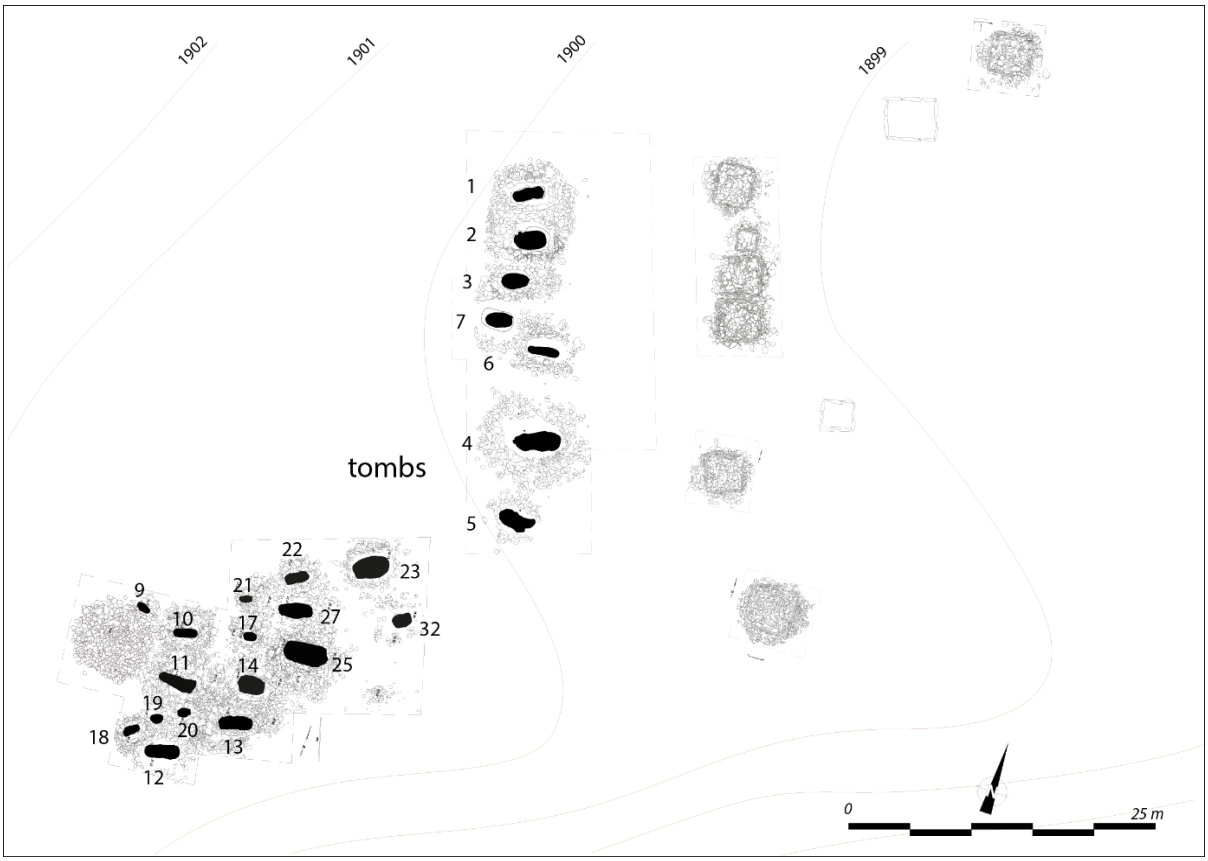
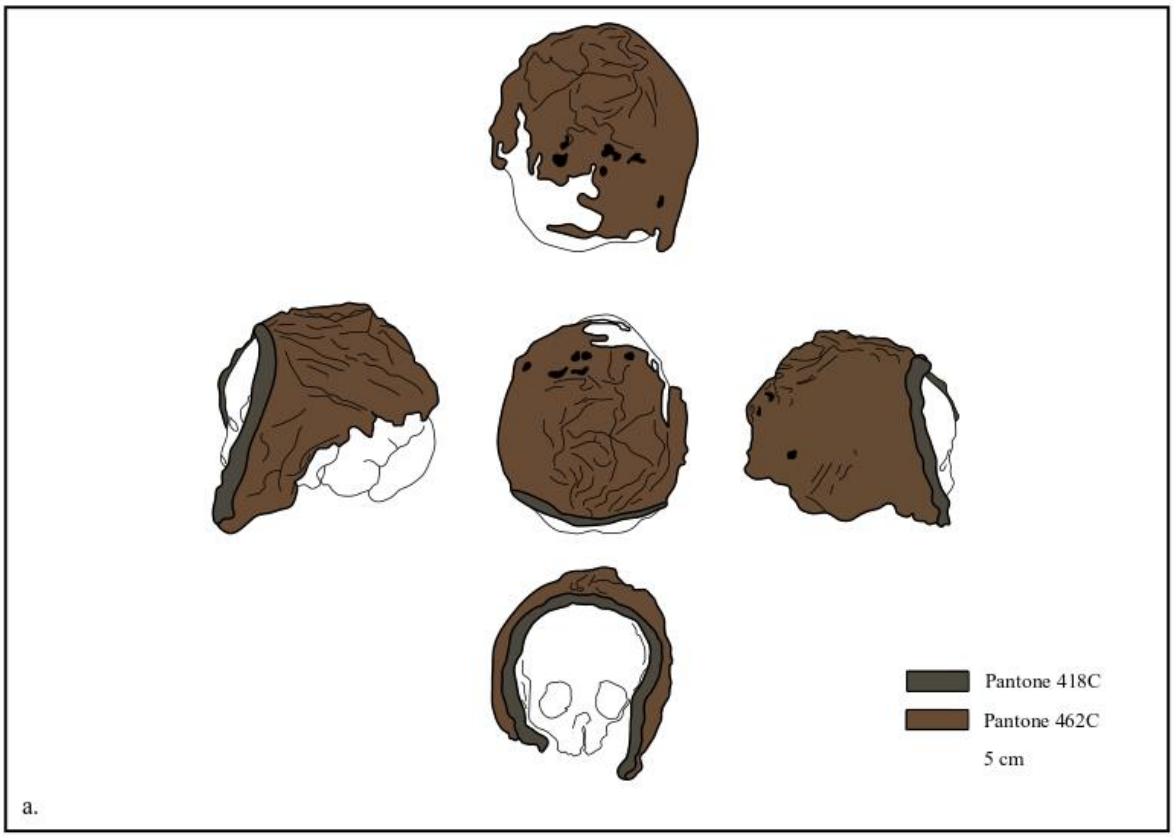


Fig. B. Plan of the Bulan-Kobin necropolis of Burgast.

Fig. C. Burgast. Burial ST 14 with the mummy in situ



a.

b.

Fig. D.1. Multi-angle drawings of the hat on the head of the child. Burgast. ST14. 14053 (in color)

Fig. D.2. Details of the inner edge of the hat. Burgast. ST14. 14053 (in color)

Fig. E Bead still belonging to a piece of textile, discovered under the child's chin (in color)

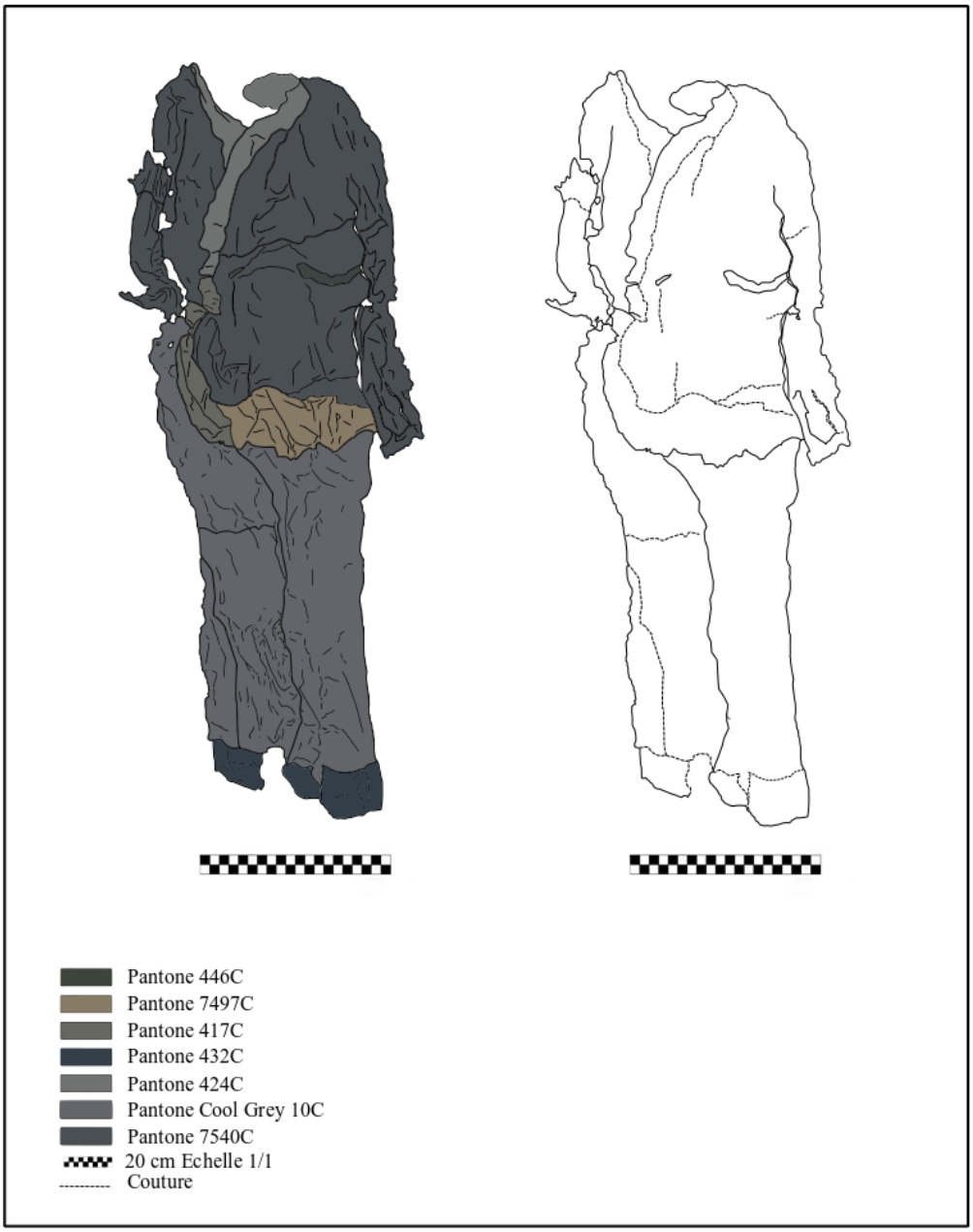


Fig. F Drawings of the tunic and trousers, showing the colours of the different components and creases in the fabric (left) and the topstitched seams (right). Burgast. ST14 (in colour)

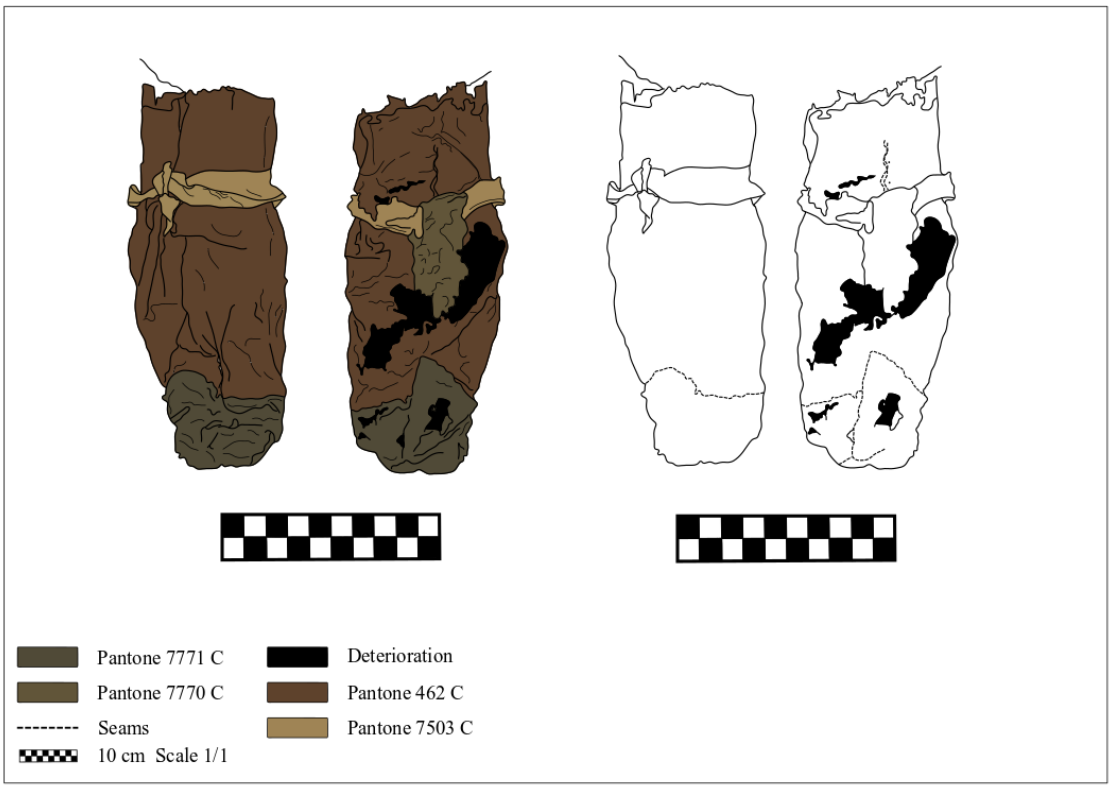


Fig. G Drawings of the left sock, showing the colours of the different components and creases in the fabric (left) and the and topstitched seams (right). Burgast. ST14. 14055 (in colour)

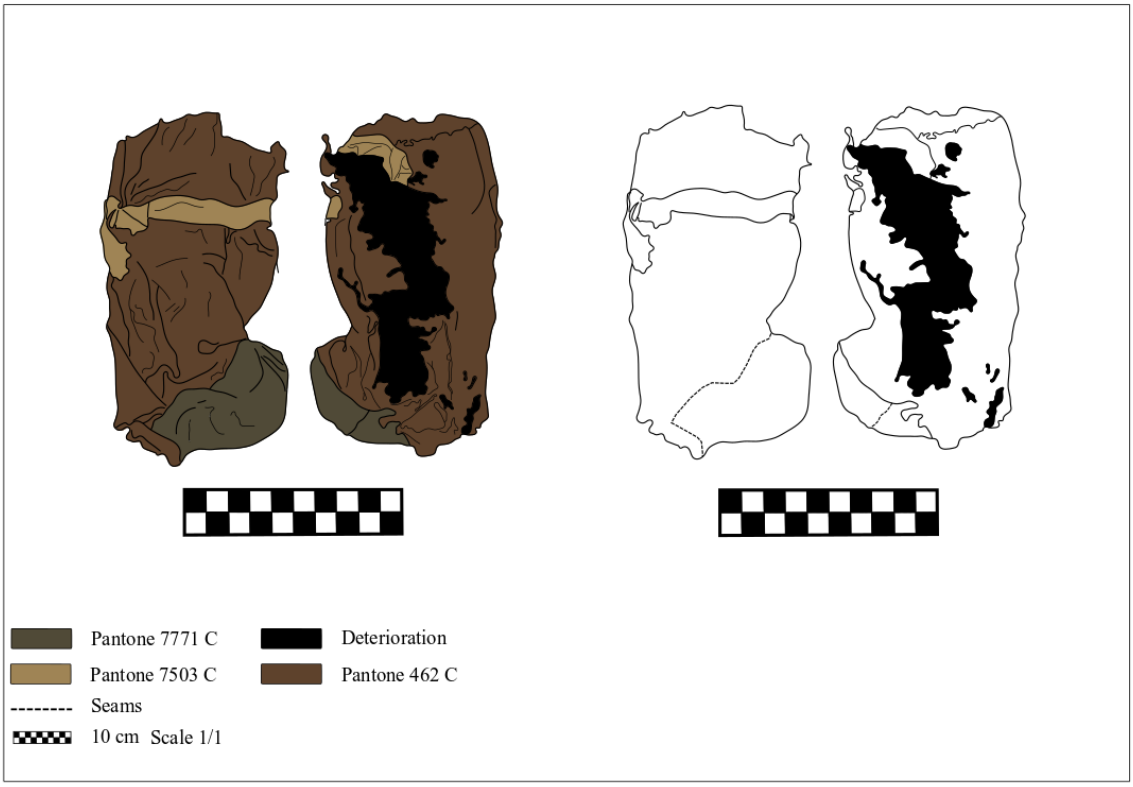


Fig. H Drawings of the right sock, showing the colours of the different components and creases in the fabric (left) and the and topstitched seams (right). Burgast. ST14. 14056 (in colour)

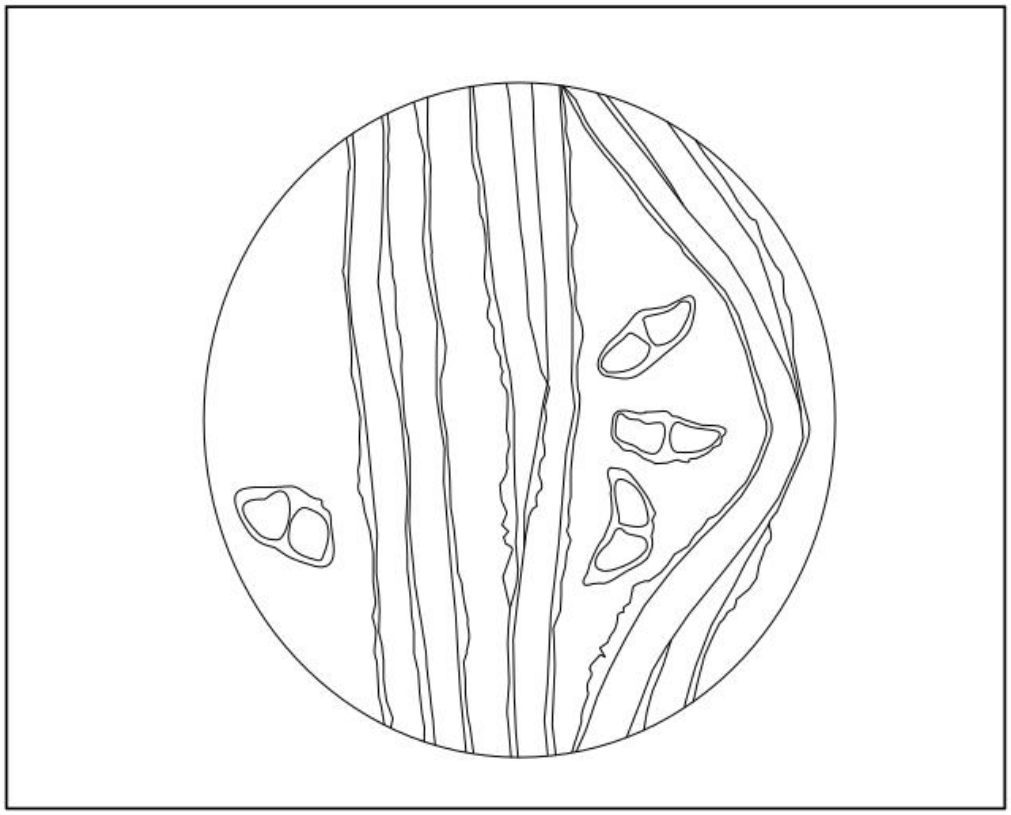


Fig. I Drawing of the longitudinal and cross-sectional shape of the silk of the domestic silkworm, *Bombyx mori*, viewed under a microscope (drawing from Guicherd 1946)

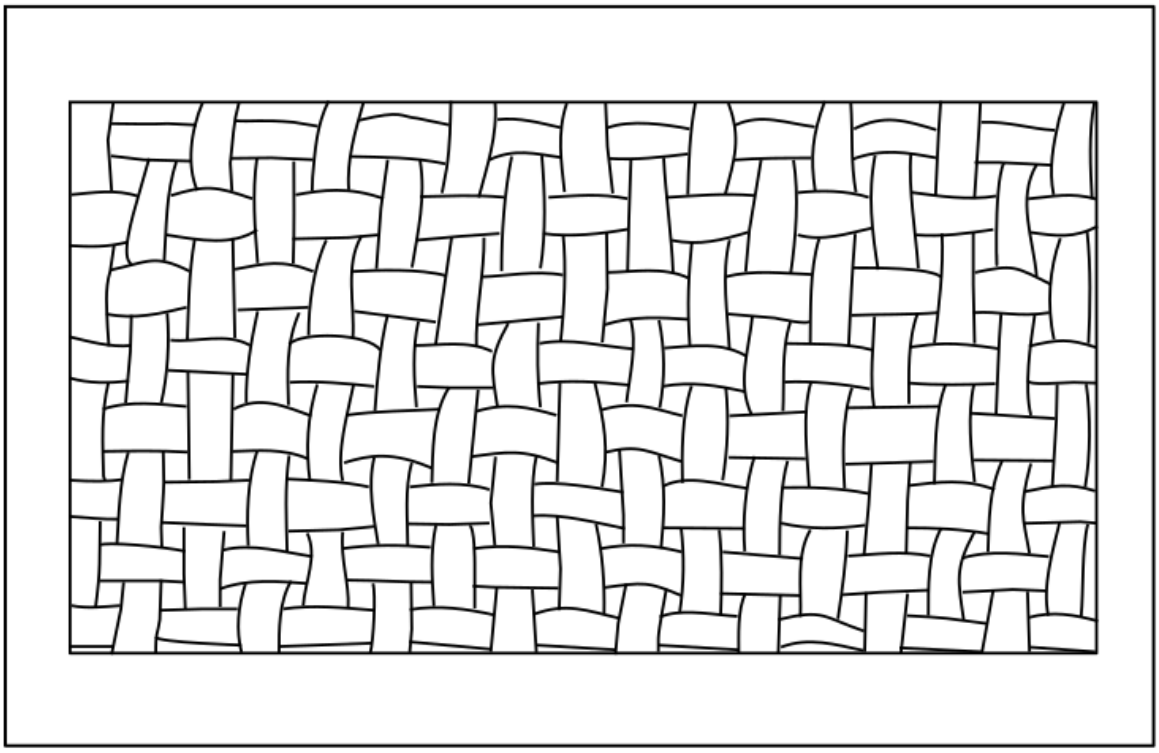


Fig. J Schematic drawing of a plain and reversible taffeta (drawing from Emery 2009)

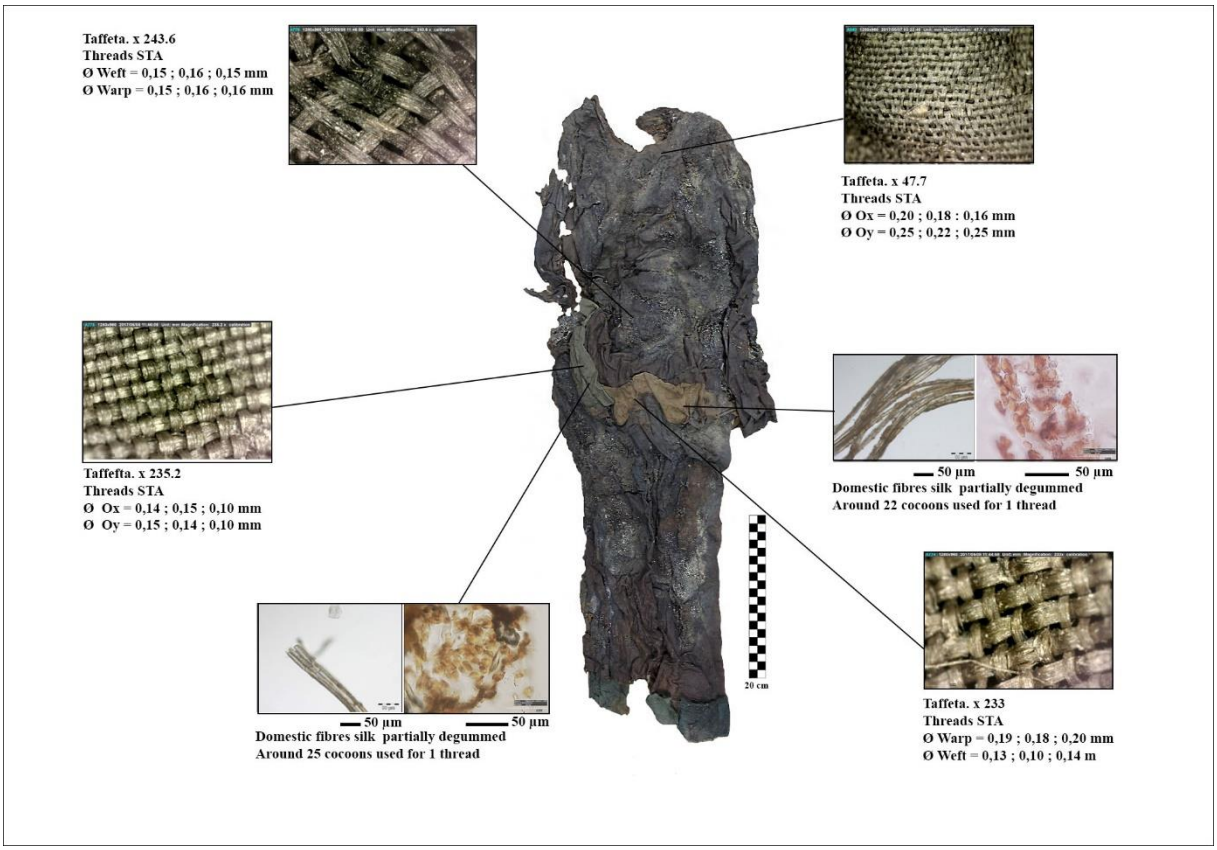


Fig. K Textiles analyzes of the threads from the tunic (in color)

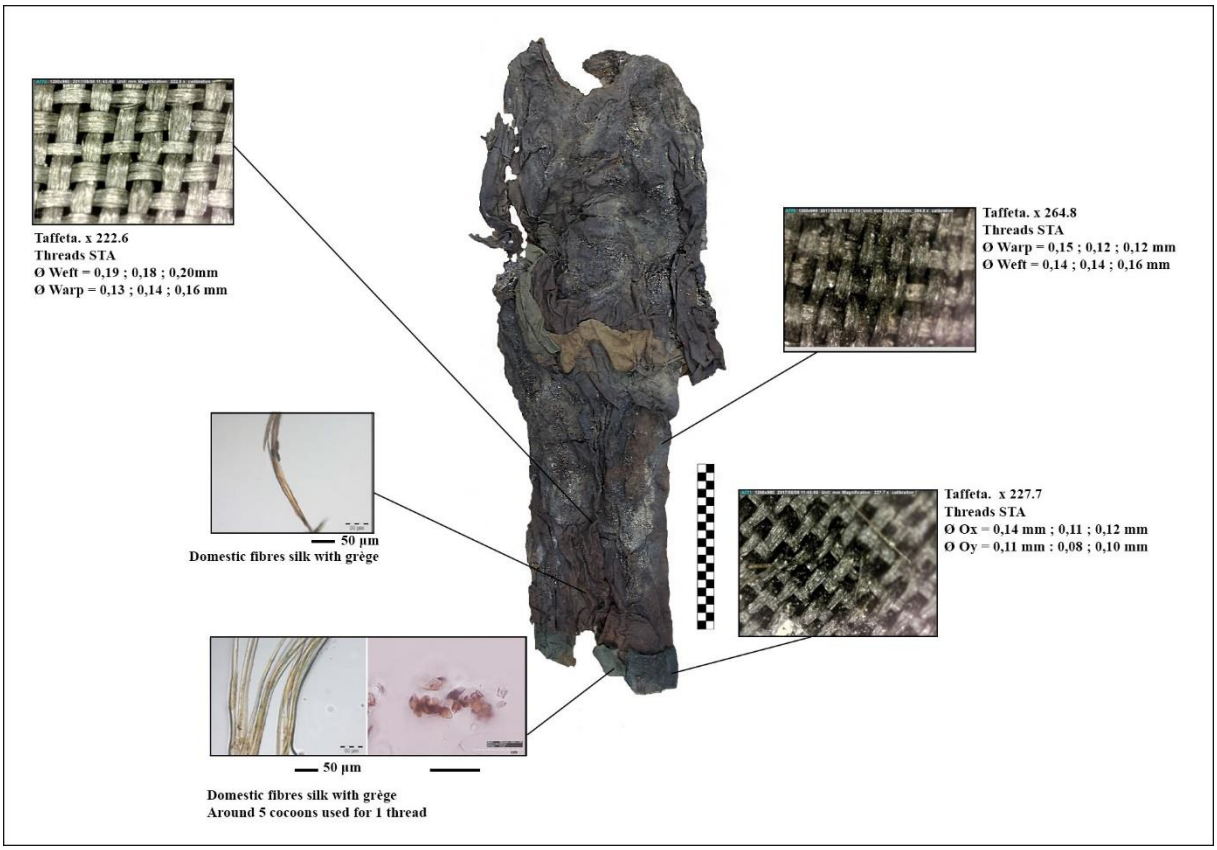


Fig. L Textiles analyzes of the threads from the trousers (in color)

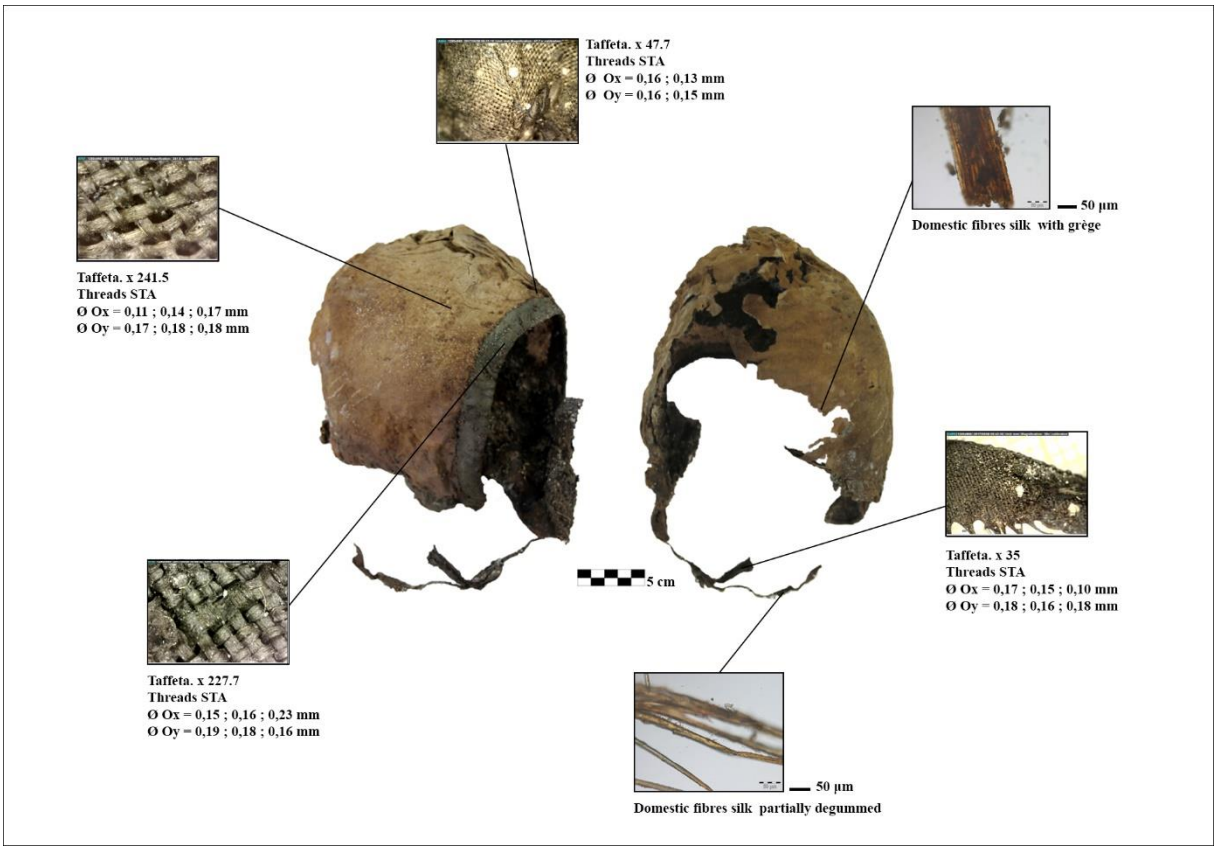


Fig. M Textiles analyzes of the threads from the hat (in color)

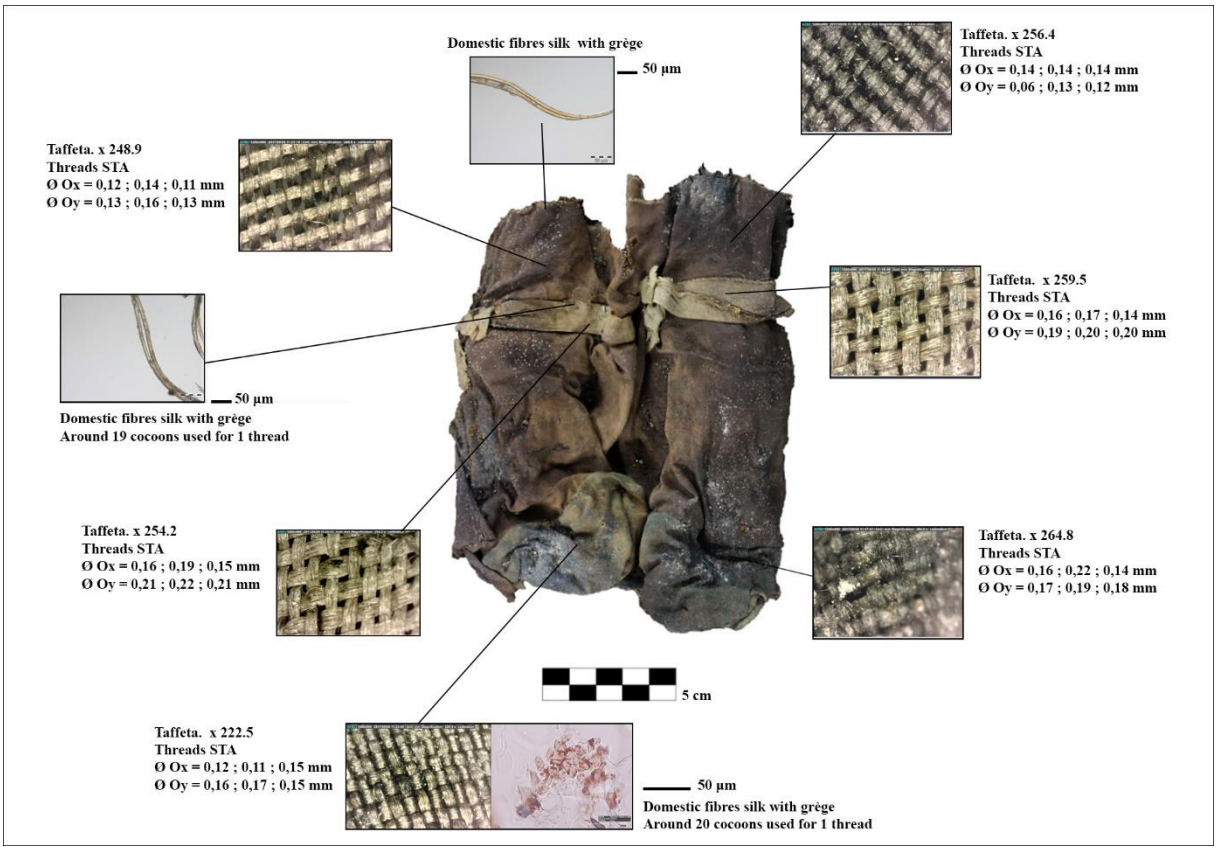
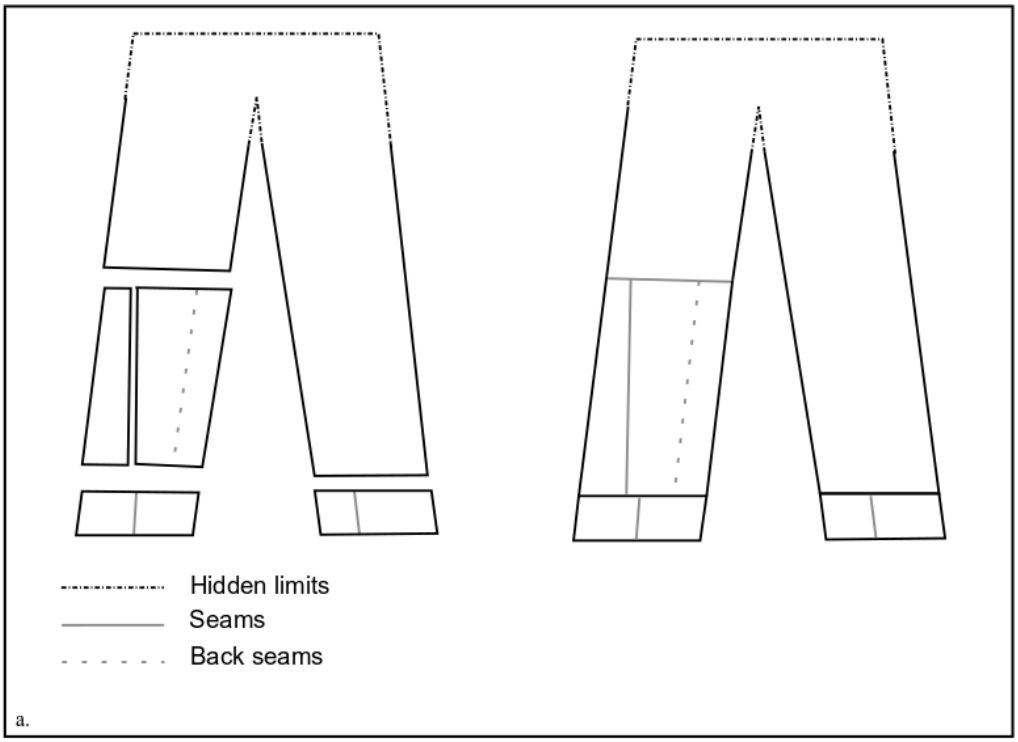
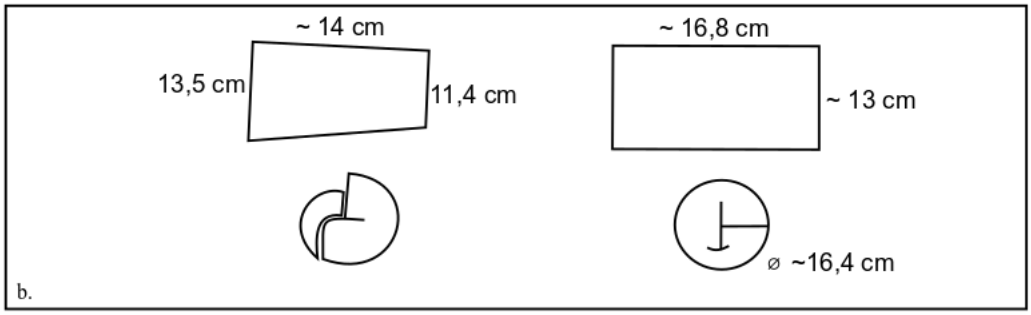


Fig. N Textiles analyzes of the threads from the socks (in color)





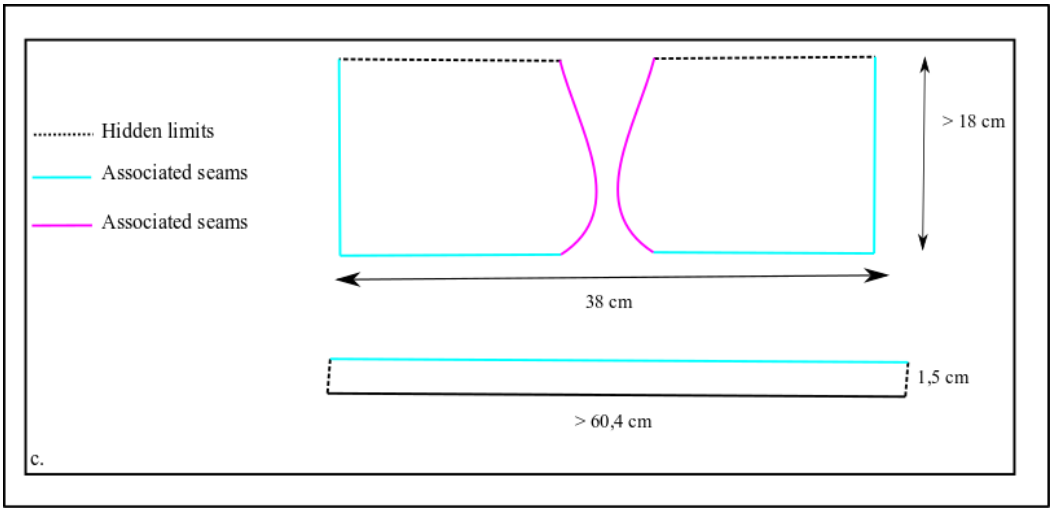


Fig. O.1 Reconstructed sewing pattern of the trousers (in b&w)

Fig. O.2 Reconstructed sewing pattern of the socks (in b&w)

Fig. O.3 Reconstructed sewing pattern of the hat (in colour)

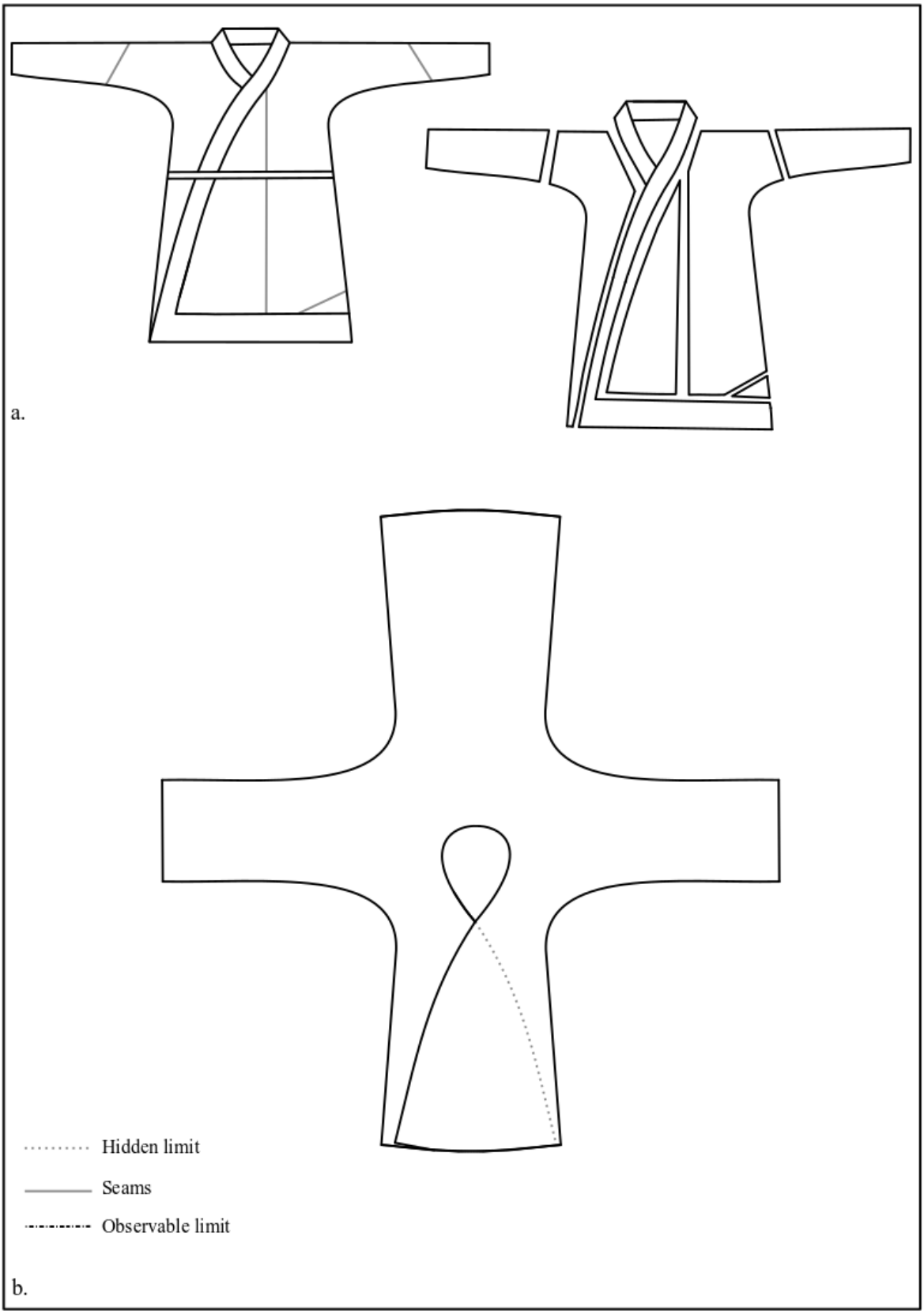

a.
Hidden limit
Seams
Observable limit
b.

Fig. P Reconstructed sewing pattern of the tunic, showing front and back views (a) and folded-out view (b), (in b&w).

Fig. Q Selvedge along the tunic's length, showing the holes left by stitches (in colour)

Fig. R Selvedge along the tunic's bottom (in colour)

Conflicts of Interest Statement

Manuscript Title : Making clothes, dressing the deceased: Analysis of 2nd century AD silk clothing from the child mummy of Burgast (Altai Mountains, Mongolia)

The authors whose names are listed immediately below : Isaline Saunier, Vincent Bernard, Mathilde Cervel, Dominique Joly, Noost Bayarkhuu, Tsagaan Turbat, Antoine Zazzo, Sébastien Lepetz, certify that they have NO affiliations with or involvement in any organization or entity with any financial interest (such as honoraria; educational grants; participation in speakers' bureaus; membership, employment, consultancies, stock ownership, or other equity interest; and expert testimony or patent-licensing arrangements), or non-financial interest (such as personal or professional relationships, affiliations, knowledge or beliefs) in the subject matter or materials discussed in this manuscript.

Author Statement :

Isaline Saunier : Investigation, Conceptualization, Methodology, Formal analysis, original draft; Writing - review & editing

Vincent Bernard : Investigation, original draft, Writing, review & editing

Mathilde Cervel : Investigation, review

Dominique Joly : Investigation, review

Noost Bayarkhuu : Investigation

Tsagaan Turbat : Investigation, review

Antoine Zazzo : Investigation, original draft, review & editing

Sébastien Lepetz : Conceptualization, Investigation, Funding acquisition, original draft; Writing, review & editing, Supervision